

# De Re / De Dicto

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## 1 Introduction

The *de re / de dicto* distinction is based on the ways in which (broadly speaking) intensional operators can affect the interpretation of other elements, especially noun phrases, in a sentence. While it is most commonly discussed in connection with modal expressions, which are standardly construed as quantifiers over possible worlds, entirely parallel phenomena arise relative to tense, construed as involving quantification over times, and other temporal expressions. In some lines of work, both of these dimensions are tied together by talking about situations, which can be seen as parts of worlds extending over a given time span. As we believe that these different dimensions pattern together in terms of the *de re / de dicto* distinction, we will draw on examples from all of these realms. We begin with a brief historical background of the distinction, and then lay out the basics of a traditional analysis in terms of scope. Next, we review the challenges to such a theory, and then sketch possible revisions to capture the problematic data. We close with some loose ends and possible further areas of related phenomena.

## 2 Historical Background

### 2.1 Early observations & origins of terms

The earliest known observation that a modal may affect some elements in a sentence without affecting others is due to Aristotle,<sup>1</sup> who discusses sentences like the following, each of which is interpretable in the two ways shown:

- (1) It's possible for a sitting man to walk.
  - a. A sitting man still possesses the ability to walk.
  - b. It's possible for a man to simultaneously sit and walk.
- (2) It's possible for a man who is not writing to write.
  - a. A man who is not writing still possesses the ability to write.

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<sup>1</sup>Dutilh Novaes (2003) traces it to Sophistisics Elenchis, 166a24–166a30.

- b. It's possible for a man to simultaneously write and not write.

The (a) interpretations of the sentences above make perfect sense: your ability to walk or write remains even at times when you are not performing these activities. The (b) interpretations are paradoxes, though: no one has the ability to walk and sit or write and not write simultaneously. The distinction hinges on which portions of the sentence are part of the ability (or possibility) being described. If the entirety of the ability being described is the ability to write (or walk), then the sentence makes sense. However, if the ability described includes both writing and not writing (or both walking and sitting), the paradox arises. We can view this difference as a difference of whether or not the modal operator is affecting the interpretation of the phrase *sitting* in (1) or *not writing* in (2).

According to Kneale (1966), the next serious discussion of this effect did not appear until 1500 years later, when Peter Abelard distinguished two types of interpretations of modal sentences: *de re*, where a modal sentence is about a thing (*re*) and *de sensu*, where a modal sentence is about a linguistic statement. For instance, the (a) interpretations above would be *de re*, since they are predicated of a person: the man who is sitting or not writing. The (b) interpretations would be *de sensu*, though, since the modal expression *it's possible* is not predicated of a thing, instead taking only a clausal complement: *a man to simultaneously sit and walk* and *a man to simultaneously write and not write*. This seems to be the origin of dividing modal sentences into ones about things (*de re*) and ones not about things.

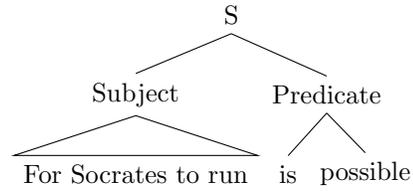
The next evolution of the terms, again according to Kneale, is a distinction between modal sentences about *dicta* – roughly the *de sensu* interpretation of Abelard – and sentences not about *dicta*. The idea is roughly that certain modal expressions modify what a particular clause says (*id quod dicit propositio* in Latin). For instance, in (2b) above, the possibility modal modifies a linguistic statement akin to “a man simultaneously writes and does not write,” claiming that it is possible for this statement to be true.

The first full use of the terms *de re* and *de dicto* is due to Thomas Aquinas, who was also the first to define the terms syntactically:

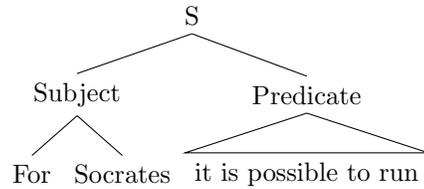
- (3) A modal proposition is either *de dicto* or *de re*. A modal proposition *de dicto* is one in which the whole *dictum* is the subject and the modal is the predicate, as when it is said ‘For Socrates to run is possible.’ A modal proposition *de re* is one where the modal is interpolated in the *dictum*, as when it is said ‘For Socrates it is possible to run.’ (translated by Dutilh Novaes 2003)

Aquinas divides the sentence syntactically into the subject and the predicate. The subject may be a full clause (in the *de dicto* case) or a thing (in the *de re* case), as illustrated below:

(4) *de dicto*:

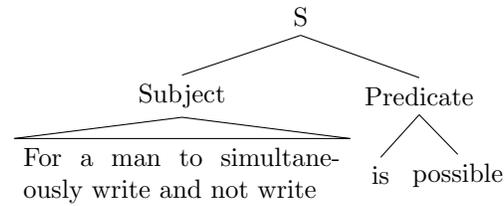


(5) *de re*:

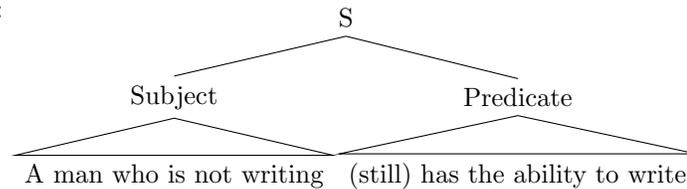


We see a similar (actually clearer) syntactic distinction in English, where certain modals can take noun phrases as subjects and clauses as objects, while others only take clauses:

(6) *de dicto*:



(7) *de re*:



The terms used by Aquinas were adopted by von Wright (1951) in his book on modal logic. Prior (1952) and Kneale (1966) took up this thread and soon the terms were standard in modal logic. However, they still referred to sentences, and not to noun phrases: a modal sentence was *de re* if it comprised a modal predicate with a noun-phrase subject.

## 2.2 The modern distinction

Following up on Frege's (1892) observations about proper names in intensional contexts, Russell (1905) discusses the following pair of examples:

- (8) a. George IV wished to know whether Scott was the author of *Waverley*.
- b. George IV wished to know whether Scott was Scott.

While serving as Prince Regent of England in 1815, George IV famously remarked that he wanted to meet “the author of *Waverley*,” presumably being impressed by the novel. Russell’s example in (8a) is meant perhaps to describe the state of affairs after George IV has enough of an idea of who wrote the novel to ask whether Scott did so, but before he knows for sure that Scott wrote the book. Russell points out that although Scott actually is the author of *Waverley*, (8a) means something quite different from (8b); as Russell puts it, upon hearing (8a), “an interest in the law of identity can hardly be attributed to the first gentleman of Europe” as it could be upon hearing (8b).

Although Russell does not use the term, his example represents the first clear exposition of a *de dicto* reading as the phrase is used today. Consider the following quote perhaps attributable to George IV before he has any idea who wrote *Waverley*:

- (9) I want to meet the author of *Waverley*.

All that the Prince means to say is that in situations where his desires are met, he meets the author of *Waverley* – whoever it is. Since the Prince does not know that Scott wrote this book, he would probably not agree that the expressed desire is to meet Scott. We now call this the *de dicto* reading of the noun phrase *the author of Waverley*.

Quine (1956) was the first to discuss sentences as exhibiting an ambiguity hinging on the *de re* / *de dicto* distinction, although his terminology characterizes the contrast as relational vs. notional readings. The examples involve indefinite noun phrases (*a sloop*, *a spy*), and both have two readings as shown below:

- (10) I want a sloop.  
 a. There is a certain sloop that I want. (*de re*)  
 b. I seek relief from slooplessness. (*de dicto*)
- (11) Ralph believes that someone is a spy.  
 a. There is someone whom Ralph believes to be a spy. (*de re*)  
 b. Ralph believes there are spies. (*de dicto*)

Note that (10) does not involve an overt clausal complement, though Quine’s proposal (as well as later authors’) analyzes them as equivalent to overt cases. Leaving this issue aside, we take overt cases such as (11) to be prototypical instances of the modern notion of a *de re* / *de dicto* distinction.

### 2.3 Basics of a Scope Theory

The first formal account of the *de re* / *de dicto* distinction, going back at least to Quine (1956) (with a precursor in Russell 1905), ties it to the notion of scope. Couched in a possible world theory of modality, the scope theory of *de re* / *de dicto* rests on the assumption that predicates in natural language may differ in extension from world to world and from time to time. For instance, the predicate

*President of the United States* always has a singleton set as its extension, but the member of this set may vary depending on the year. If we represent the year of evaluation as a superscript parameter on the interpretation function, we get the following values:

- (12) a.  $\llbracket \text{President of the United States} \rrbracket^{2007} = \{\text{George W. Bush}\}$   
 b.  $\llbracket \text{President of the United States} \rrbracket^{2014} = \{\text{Barack Obama}\}$

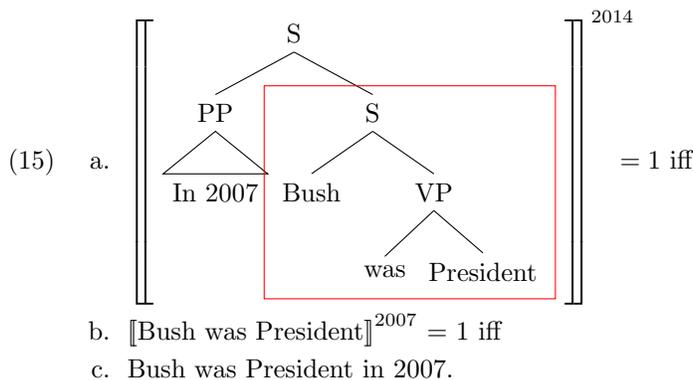
Similarly, taking  $w_0$  to be the actual world, and  $w_1$  to be an alternative possible world where Mitt Romney won the 2012 election, we have:

- (13) a.  $\llbracket \text{President of the United States} \rrbracket^{w_0} = \{\text{Barack Obama}\}$   
 b.  $\llbracket \text{President of the United States} \rrbracket^{w_1} = \{\text{Mitt Romney}\}$

The term **scope** may be defined semantically or syntactically. The semantic scope of an intensional operator comprises the material whose intensional status is directly affected by the meaning of the operator. For instance, in (14), the material *George W. Bush was President* forms the semantic scope of the intensional phrase *in 2007*.

- (14) In 2007, George W. Bush was President.

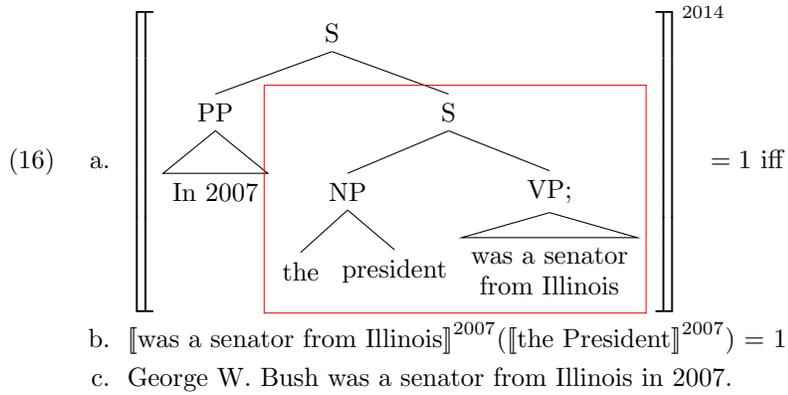
The syntactic scope of an operator, on the other hand, is its c-command domain, defined as the operator's sister and nodes dominated by its sister. The standard scope theory of *de re / de dicto* proposes that an operator's syntactic scope at the level of logical form (LF) maps directly onto its semantic scope, as illustrated below, where the scope of the operator *In 2007* is indicated by a red box:<sup>2</sup>



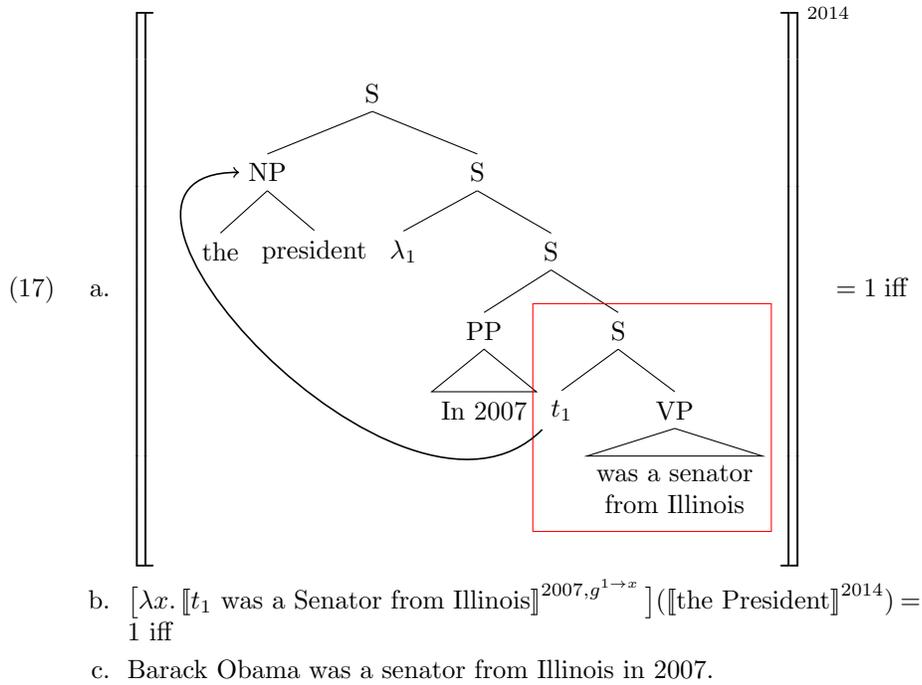
In other words, under the scope theory, an intensional operator sets the world-/time parameter (a semantic notion) of material in its c-command domain (a syntactic notion).

In this system, any material remaining in the domain of an intensional operator at LF will be interpreted *de dicto*, as illustrated in the (actually false) LF for the sentence in (16).

<sup>2</sup>Note that for present purposes of illustration, we're ignoring the contribution of the past tense here and pretend that *in 2007* is the only temporal operator at play.



In order to receive a *de re* reading, a noun phrase must raise to a syntactic position at LF above the operator, as shown in (17). Note that we follow Heim & Kratzer (1998) in assuming that adjunction of a raised noun phrase is combined with  $\lambda$ -abstraction over its trace right below the adjunction site.



### 3 Empirical Phenomena

#### 3.1 Affected expressions and linguistic environments

We now move on to lay out a more extensive (though by no means fully exhaustive) overview of the empirical landscape with regards to the *de re* / *de dicto*

distinction, starting with the types of noun phrases that exhibit the relevant readings. In addition to the cases already illustrated above, (strong) quantifiers such as *most* and *a* (even in its strong reading), too, can be interpreted relative to an operator that shifts the time of evaluation. For instance, the following sentences are most easily understood as conveying *de dicto* interpretations of the relevant noun phrases:

- (18) a. In 2008, most senators belonged to the Democratic Party.
- b. In 2008, a senator from Ohio belonged to the Democratic Party.

Delegations from particular states and political majorities in the US Senate of course change over time, and if we replaced 2008 by another year, the truth of both of these statements may change based on the range of individuals described by the nominal predicates *senators* / *senator from Ohio*.

The same effect can, of course, be found with modal expressions that shift the world of evaluation:

- (19) a. It's possible that most elected senators belong to the Republican Party.
- b. It's possible that a senator elected by Michigan belongs to the Republican Party.

Imagine waking up the day after an election before checking the results. In such a scenario, these sentences can be understood to convey that different individuals (whose identity need not be determined at the time of utterance) may have been elected members of the US Senate, resulting in a change of majority (without requiring any changes in party affiliation for any given individual).

Crucially, however, these expressions do not have to be interpreted relative to the shifted world (or time), but can also be interpreted relative to the actual world (or time of utterance):

- (20) a. It's possible that, by 2025, most senators will be enjoying their retirement.
- b. It's possible that, by 2025, a senator from Michigan will be enjoying his retirement.

In these examples, the relevant individuals are understood to be ones that actually are senators, in the real world at the time of utterance (in 2014), not the ones that are senators in 2025 or any other set of possible utterance-time senators. Thus, the relevant noun phrases are said to have a *de re* interpretation: the noun phrase is anchored in the utterance context with respect to the time and world of evaluation, rather than being evaluated relative to the time and world at which the main proposition expressed by the sentence is evaluated. The same is also available for definites and relative to time shifters, as was shown in (17) above.

While both *de re* and *de dicto* variations along the temporal dimension are very easy to come up with, modal examples typically require more care

in constructing an appropriate context, so it is worth reflecting for a moment on some of the general properties of types of contexts where the difference between *de re* readings and *de dicto* readings becomes relevant. With regards to epistemic or doxastic modal operators, one typical such situation is one where the extension of a given predicate in the actual world does not agree with all of the epistemically (or doxastically) accessible worlds. In other words, in at least some of the worlds that a speaker considers as viable epistemic alternatives, the individuals falling under the predicate *senator from Michigan* are different from the individuals that actually are senators from Michigan. It is in such contexts that one might wish to talk about either the individuals that happen to fall under the predicate in the epistemically accessible worlds — whoever they may be, varying from world-to-world — or, alternatively, about those very individuals that actually happen to fall under the description, regardless of whether they fall under it in other epistemically accessible worlds.

For example, in evaluating (19b), we are most plausibly talking about properties of individuals that might be elected senators from Michigan, in particular as we try to determine whether there are accessible worlds where at least one of the individuals that happen to be elected senator from Michigan in the respective world also are Republican (in the same respective world). In contrast, in (20b), the predicate *enjoying one's retirement* cannot plausibly be applied to individuals who are senators in the respective accessible worlds (in 2025), since being an active senator is incompatible with being in retirement. Therefore, *a senator from Michigan* is here most plausibly understood to be about the individuals who actually (and currently) happen to be senators from Michigan, and the evaluation of the sentence requires determining whether these very individuals are enjoying their retirement in any of the accessible worlds (in 2025).

Having established the basic distinction in light of the various types of noun phrases that it applies to, we now can turn to considering the inventory of embedding expressions that exhibit the two types of interpretations. These include all modal and temporal operators that operate at the sentential level (we will not consider modal expressions operating at the level of, say, noun phrases, such as the adjectives *former* or *fake*). In order to maintain a comparable inventory of examples throughout, we will mostly rely on constructed examples building on the patterns already introduced, but see the references for original examples involving the relevant expressions.

**Attitude Verbs** As noted above, one of the basic cases that was discussed early on in connection with the *de re* / *de dicto* distinction is that of attitude verbs (Quine 1956). The types of contexts where the difference in interpretations becomes relevant with these is quite parallel to those for epistemic and doxastic modals. Take the following variation of our sentences above, uttered the night after an election before John checks the news:

- (21) John thinks that most elected senators are Republican.

While we could imagine that John is said to have a specific set of individuals in mind for every seat in the senate, the more likely interpretation here is that however any given individual race for open seats in 2014 will go, it will result in an outcome where the majority of individuals elected to the senate are Republican. As before, the sets of individuals that happen to be elected in the worlds compatible with John's beliefs are not the same throughout.

In contrast, the same type of sentence can also be used to convey that John has a belief about those individuals who actually happen to be senators at the time and world of utterance:

(22) John thinks that in 2025, most senators will be retired.

The most plausible interpretation of this sentence is that John has a belief about the actual current senators – the *de re* interpretation. The same contrast in readings is available with other attitude verbs (such as *think*, *need*, *want*, etc.) as well, of course.

**Modals** Another type of expression that displays the *de re / de dicto* is that of modal verbs, such as *must*, *can*, *might*, *have to*, *should*, etc. To illustrate these, we'll introduce another type of context that will be useful for some of the phenomena to be considered below as well. Imagine a game show, where the candidate has to answer questions about different trades in competition with professionals in those trades.

First, let's consider a scenario compatible with a *de dicto* reading below an epistemic modal. Imagine that the order in which the various professionals enter for different rounds is determined by randomly lining them up behind stage. We're watching that line, but can't see the first two people. But we think that the first two people are plumbers, namely John and Sue, though actually Sue is a carpenter. In such a situation, we might utter the following sentence:

(23) (According to our beliefs,) the candidate has to face a plumber next.

Given a doxastic interpretation of the universal modal *have to*, this is true on a *de dicto* interpretation, since in all worlds compatible with what we believe, the candidate faces either John or Sue, who are plumbers in those worlds. But it's not true on the *de re* interpretation, since there is no one individual that is actually a plumber whom the candidate will face in all worlds compatible with what we know.

Now let's consider a scenario compatible with a *de re* reading above a deontic reading of the same modal (in the same sentence). Imagine a variant where, based on the game rules, the order of candidates is by alphabetical order of their first names. The next in the alphabet is John. Now using the modal deontically, we could describe this situation as follows:

(24) (Based on the rules of the game,) the candidate has to face a plumber next.

The sentence is now true on a *de re* interpretation of *a plumber*, since there is an actual plumber — John — that the candidate has to face next based on the rules of the game and given where we are in the alphabet. But the rules of the game say nothing about the occupation of the next contestant, so there are worlds compatible with the requirements of the game where the next candidate is not a plumber. Thus, the sentence would be false on a *de dicto* interpretation. Of course, scenarios favoring *de re* readings with epistemic modals and *de dicto* readings with deontic modals can also be constructed. (We leave these as an exercise for the reader!)

**Adverbial Quantifiers** Parallel observations can be made for modal adverbs, such as *possibly*, *necessarily*, *probably*, etc. Rather than repeating what would be very much the same type of example, we instead turn back to the temporal domain. In addition to the effects with temporal prepositional phrases that we used above, we can find parallel phenomena with various temporal operators, including adverbial quantifiers such as *always* and *usually*, which can be seen as quantifying over points (or intervals) of time. Starting with a *de re* example, consider the following:

- (25) Michelle Obama usually spends her vacation with the president in Hawaii.

This is most plausibly interpreted as conveying that Michelle Obama is typically spending her vacations with the actual current president, during, before and after his presidency, rather than with whoever is president at a given point in time.

In contrast, going back to the game show scenario above, we could describe the variant where the contestants go up in alphabetical order as follows:

- (26) The candidate always starts out by facing the professional whose name comes first in alphabetical order.

Here we are not talking about some specific contestant, since these may vary across different instantiations of the game show. Rather, what is being said here is that no matter who the contestants are on a given day, it will always be the case that the one whose name come first in the alphabet amongst the contestants on that day will be the first one the candidate has to face (*a de dicto* reading).

**Tense** Given the effects with temporal adverbials and prepositional phrases, it is not surprising that we can find parallel phenomena relative to tense, i.e., temporal information expressed as part of the verb phrase (either via tense morphology on the main verb or through a temporal auxiliary). While there are different well-established analyses of tense in the literature which differ in whether they see tense itself as an operator over times or rather as introducing reference to a contextually salient time, any account sees the overall temporal information expressed by tense as something that other expressions in the clause can interact with scopally. Let's start with a *de re* example:

(27) Most senators went to college in their home state.

Since senators don't typically attend college while being members of the senate, the most natural interpretation of this sentence is that for most of the individuals who are senators *now* there is a time in the past (plausibly prior to their membership in the senate) at which they attended college in their home state.

An illustration of a simple *de dicto* example can be construed most easily when we provide an explicit temporal point of reference, either by a temporal prepositional phrase, as in the initial examples, or by having an explicit context, e.g., in the form of a question:

- (28) a. What was the political situation in Congress in 2004?  
b. Most senators were Republican.

As in the initial examples, the most plausible interpretation of the reply is that most individuals who were senators in 2004 were members of the Republican party. On this interpretation, the sentence is indeed historically true, whereas on a potential *de re* interpretation, it is false.

**Some Issues and Questions** Up to this point, we have considered the various examples exhibiting the *de re* / *de dicto* distinction, which included a range of different noun phrases and embedding operators, as an entirely uniform phenomenon, and that is indeed the obvious starting point as we strive for theoretical parsimony. But this simple theoretical picture may come under fire if we find substantial differences in the behavior of different expressions involved. Some of such differences will indeed come up below. In light of these, the main question will be whether these differences undermine a unified picture, or whether we can maintain the unified picture and attribute any potential differences to independent factors that interact with the core mechanisms giving rise to the different interpretations.

As far as the data considered so far is concerned, the traditional scope theory sketched above can handle all the basic cases, and its simplicity makes it useful for illustration of the basic phenomena. However, a number of more complicated examples are by now well-established as showing that a simple traditional theory based on scope is empirically inadequate. We turn to a discussion of the most important phenomena that are beyond its reach next.

## 4 Further Complications

### 4.1 Multiple embeddings & intermediate readings

To this point, the examples we have considered involve only one operator relative to which a noun phrase can be interpreted *de re* or *de dicto*. If this was all there was, a very simple alternative account of the data would be that the world or time of utterance relative to which the entire sentence is interpreted always remains accessible in embedded environments. Technically, this could be

implemented by having a special parameter on the interpretation function that does not get shifted (something similar is necessary for indexicals anyway). This would make it possible to account for at least some of the phenomena considered above without any scope-taking or movement. For example, our sentence (17) could simply be interpreted as in (29b), assuming we have some mechanism in place to ensure that the definite gets evaluated relative to the utterance-world parameter. Here, the time used for evaluation is indicated via underlining:

- (29) a. In 2007, the president was a senator from Illinois.  
 b.  $\llbracket \text{was a senator from Illinois} \rrbracket^{(2007, 2014)} (\llbracket \text{the president} \rrbracket^{(2007, 2014)}) = 1$  iff  
 c. Barack Obama was a senator from Illinois in 2007.

However, once we consider more complex examples with more than one operator, we see that mere access to the world of utterance is not enough. A noun phrase in the most embedded clause can be interpreted *de re* relative to the lower operator but *de dicto* relative to the higher one. Take the example in (30a), a variant of the game show context considered above. Specifically, assume that the next two professionals in line for facing the candidate are painters. Sam, who’s observing with us from backstage, incorrectly assumes that they are plumbers. Furthermore, Sam does not know which one of the two professionals is first in line, but he is fully informed about the actual rules of the game. We could appropriately describe this situation with the following sentence, as made clear by the paraphrase.

- (30) a. Sam thinks that the candidate has to face a plumber in the next round.  
 b. ‘In all worlds  $w'$  compatible with what Sam believes in  $w_0$ , there is some  $x$  who is a plumber in  $w'$  and in all worlds where the rules of the game in  $w'$  are followed, the candidate has to face  $x$  in the next round.’

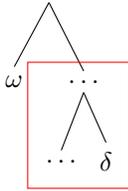
The noun phrase *a plumber* here is interpreted relative to Sam’s belief-worlds. Note that there is no particular person of whom Sam thinks that they are next — it could be either one of the two. But he takes both of them to be plumbers, thus he believes a plumber is next. But he is under no false impression about the rules of the game, and he does not relate their status as (presumed) plumbers to the rules at all. So in this case, it will not suffice for the noun phrase in question to either have access to the world quantified over by its immediate embedding operator or the world of utterance. Instead, it is interpreted relative to the higher embedding operator. Thus, the notions of *de re* / *de dicto* are relative notions: the noun phrase in question is *de re* relative to the modal but *de dicto* relative to the attitude verb in (30a). The scope theory can account for this by moving *a plumber* to a landing site between the two operators. Of course, one could also consider adding yet another parameter slot on the interpretation function. We will return to this possibility in section 5.1. For now, the main

points are that a) mere access to the world (or time) of utterance does not suffice to capture the full range of phenomena, and b), *de re* / *de dicto* are relative notions to be understood with respect to a specific operator.

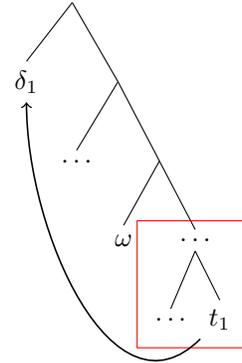
## 4.2 Scope islands, paradoxes, and Fodor’s third reading<sup>3</sup>

The second set of issues we would like to turn to concerns the relationship of the noun phrases in question to two components of modal intensional operators. On the one hand, these operators affect the intensional status of noun phrases in their semantic scope. But since both they and (at least certain ones of) the noun phrases also involve quantification (over worlds or times and individuals, respectively), they also end up in a scopal relationship. On the traditional scope theory, these two properties are tied together. Consider the structure in (31a), showing a noun phrase  $\delta$  c-commanded by an intensional operator  $\omega$ . Under the traditional scope theory of *de re* and *de dicto*, this configuration is only compatible with a *de dicto* reading for  $\delta$  relative to  $\omega$ . In order to receive a *de re* reading relative to  $\omega$ ,  $\delta$  must move to a position above  $\omega$ , as schematized in (31b).

(31) a. *De dicto*:



b. *De re*:



This simple feature of the analysis makes two predictions about a noun phrase  $\delta$  and an intensional operator  $\omega$  in such a configuration:

- (32) a. If  $\delta$  is trapped below  $\omega$  (due to a syntactic island or another barrier to movement),  $\delta$  may not be *de re* relative to  $\omega$ .  
 b. The quantificational force of  $\delta$  will scope above the quantificational force of  $\omega$  if  $\delta$  is *de re* relative to  $\omega$  and below the quantificational force of  $\omega$  if  $\delta$  is *de dicto* relative to  $\omega$ .

Counterexamples have been raised for both of these predictions.

<sup>3</sup>This section is closely based on one from Keshet (2011).

**May: finite clauses** One counterexample to the prediction in (32a) is due to May (1977). May points out that quantificational noun phrases inside finite clauses cannot scope outside of these clauses.<sup>4</sup> For instance, in (33a), the noun phrase *every rally in John's district* can scope above *some politician*, yielding a reading where (potentially) different politicians will speak at each rally. However, this reading – and hence, presumably, this scoping – is unavailable in (33b):

- (33) (= von Fintel & Heim (2008) (170))
- a. Some politician will address every rally in John's district.
  - b. Some politician thinks that he will address every rally in John's district.

Let us now turn our attention to (36a). Its *de dicto* reading attributes a contradictory belief to Mary, as she would consider the same set of people to be outside and inside. However, this sentence clearly also has the more sensible *de re* reading which asserts that everyone actually in this room is such that Mary thinks that he or she is outside. According to the scope theory, then, the phrase *everyone in this room* must move to the position shown in (36b) in order to receive its *de re* reading. Based on the data in (33), however, May calls into question whether such a phrase could move to the position it holds in (36b).<sup>5</sup> This contradiction poses a problem for the scope theory.

- (36) a. Mary thinks that everyone in this room is outside.  
 b. [everyone in this room]<sub>x</sub> [Mary thinks that *x* is outside]

Now, one conceivable way to resolve this problem would be to make an exception to allow quantificational noun phrases to scope out of islands under certain circumstances. For instance, perhaps such a noun phrase is allowed to move to become *de re*, but not allowed to move for (other) scope reasons. As seen in the next section, though, such a relaxation of the rules is not enough to solve the problem.

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<sup>4</sup>Wilder (1997) later refuted the strongest form of this claim. However, it still seems that the subject of a finite clause cannot scope out of that clause.

<sup>5</sup>This also ties in with facts concerning Antecedent Contained Deletion (Sag 1976) that involve the subjects of finite clauses:

- (34) Mary wants to report everyone that Bill does.  
 a. ... Bill reports.  
 b. ... Bill wants to report.
- (35) Mary thinks that she reported everyone that Jill did/\*does.  
 a. ... Jill reported.  
 b. # ... Jill thinks she reported.

In (34), where the noun phrase with an elided phrase is not inside a finite clause, the ellipsis can refer to the entire clause, as shown. However, in (35), where the noun phrase is inside a finite clause, the ellipsis can only refer to the inner clause, presumably because the noun phrase may not raise to the top of the sentence.

**De re noun phrases in *if*-clauses** Another island for syntactic movement is an *if*-clause:

(37) Some politician will be happy if everyone votes for him.

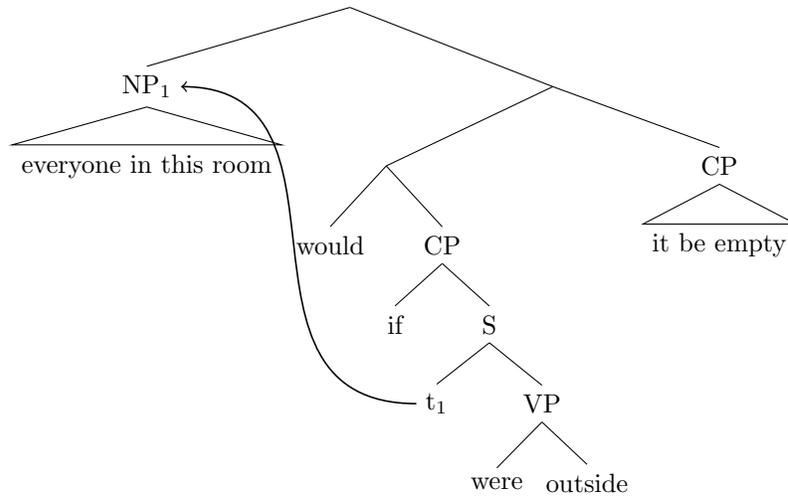
Similar to the example in the previous section, (37) lacks the reading where the quantifier *everyone* scopes above the quantifier *some politician* – i.e., where each person  $x$  is such that there is a particular politician who will be happy if  $x$  votes for him. And yet, despite this restriction on quantifier movement from within *if*-clauses, such noun phrases may be *de re*, as seen in the following variation of (36a):

(38) If everyone in this room were outside, it would be empty.

Considerations parallel to (36a) apply: Since no one can be in this room and outside in the same world, the noun phrase *everyone in this room* must be *de re* relative to the modal governing the conditional in order for (38) to make sense. Therefore, in order to maintain the scope theory, one would have to add *if*-clauses to the list of islands that quantifiers may sometimes escape.<sup>6</sup>

Relaxing the rules on when quantifiers may move out of syntactic islands does not solve all of the problems with the scope theory, though. As described in (32b), the scope theory predicts that the quantificational force of a *de re* noun phrase will scope in a position above the relevant intensional operator. Consider the following structure for (38), though (see Lewis (1975), Kratzer (1986)):

(39)



The scope theory predicts that the quantificational force of *everyone in this room* should take scope above that of the modal *would*. A paraphrase of the meaning of this structure is *everyone  $x$  in this room is such that if  $x$  were outside, this room would be empty*. This suggests that the sentence means that the

<sup>6</sup>In fact, since an *if*-clause is clearly a finite clause and arguably a complement, this may be another instance of the type of island discovered by May.

absence of any one person in the room would render the room empty. However, as several researchers have pointed out for parallel examples (von Stechow (1984), Abusch (1994), and Percus (2000)), the sentence can convey that it is the absence of the totality of the people actually in the room which renders the room empty, not the absence of just one person. Thus, we seem to have a combination of a *de re* reading with narrow quantificational scope.

A similar puzzle can be constructed for sentences involving temporal intensionality, as shown in (40):

(40) When everyone in this room was outside, it was empty.

In (40), the items being quantified over are presumably times, not possible worlds, but the problem remains. (40) does not mean that for everyone in this room  $x$ , when  $x$  was outside, the room was empty. These two examples reveal that merely relaxing the rules on movement out of syntactic islands is not enough to solve the problems of the scope theory.

**Fodor: specific vs. transparent** Another case where the quantificational force of a *de re* noun phrase takes scope below the relevant intensional operator was pointed out by Fodor (1970). Consider yet another variation of our game show context, where the candidate is shown headshots of various professionals, and gets to choose who to face next. She’s in the process of deciding, and has narrowed it down to two, John and Sue, whom we know to be plumbers (while the candidate is ignorant in this regard). We can describe the situation with the sentence in (41). But this is unexpected on either the *de re* or the *de dicto* reading, which both are false in this scenario. Thus the point of Fodor-style examples like this one is that they have more than two readings.

(41) Mary wants to face a plumber next.

- a. **Non-specific, Opaque** (*de dicto*): Mary has a preference for what type of professional to face next: she wants it to be a plumber.
- b. **Specific, Transparent** (*de re*): There’s a specific individual, say John, that Mary wants to face next. He actually happens to be a plumber, but Mary may or may not know this.
- c. **Non-specific, Transparent**: Mary wants to face either John or Sue next, for instance, although she had not decided which yet. Both John and Sue actually happen to be plumbers, although Mary may or may not know this.

(41a) and (41b) describe what we have been calling the *de dicto* and *de re* readings, neither one of which makes the right prediction for the above context. First, consider the *de dicto* reading: it is false in that context, since Mary has no idea that John and Sue are plumbers, so their property of being a plumber is not at all reflected in her beliefs. Secondly, the *de re* reading is also false: there is no specific individual that Mary wants to face next – she wants to face either John or Sue. Therefore, Fodor argues that there is another reading, given

in (41c), and it is this reading that accounts for the context laid out above: in all of Mary’s desire worlds, the person she faces next is a plumber in the actual world (but not necessarily in the respective desire worlds). Fodor’s account is based on the insight that the quantificational force of an indefinite like *a plumber* can scope separately from its intensional status. She calls readings where the quantificational force scopes above the intensional operator *specific* and those where it scopes below *non-specific*. Fodor calls readings where the intensional status scopes above the intensional operator *transparent* and those where it scopes below *opaque*.

Please note that in the present paper, we will continue to refer to items as *de re* when their intensional status scopes above an intensional operator (i.e., they are transparent in Fodor’s terminology), whether their quantificational force scopes above this operator (i.e., they are specific) or below this operator (i.e., non-specific). Similarly, we will continue to refer to items as *de dicto* when their intensional status scopes below an intensional operator.

Fodor’s three readings also carry over to the domain of times, as shown in the following example:

- (42) Between 1990 and 1995, John always took a buddy (of) his same weight to the world series.
- a. **Non-specific, Opaque:** John took a different buddy to each world series and each time he weighed the same as John at that time.
  - b. **Specific, Transparent:** There is a particular buddy who is now John’s weight that John took to each world series.
  - c. **Non-specific, Transparent:** John took a different buddy to each world series and each one weighed the same (at that time) as John does now.

If you take *always* to be a universal quantifier over times, (42) sets up a similar three-way split to (41). The specific reading is one where the quantificational force of *a buddy (of) his same weight* scopes above *always*, and the non-specific readings are those where this noun phrase scopes below *always*. The transparent readings are those where the weight is the same at the speech time, and the opaque reading is one where it is the same at the time being quantified over (in this case each world series).<sup>7</sup>

In summary, the data reviewed in this section establishes two important facts for theories of *de re* and *de dicto*: first, *de re* and *de dicto* are relative notions, such that a given noun phrase’s property of being *de re* or *de dicto* is always relative to a specific intensional operator. Secondly, quantificational scope and *de re/ de dicto* are not entirely tied together, contrary to what the traditional scope theory predicts.

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<sup>7</sup>One other problem for the scope theory is raised by Bäuerle (1983), but we refer readers to Keshet (2010) for more information.

## 5 Refined Approaches

In light of the problems for the traditional scope theory just reviewed, several alternative approaches for capturing the various readings have been considered in the literature. The crucial feature they all share is that they loosen the connection between quantificational scope properties of a noun phrase on the one hand and its intensional status on the other. But they do so through different strategies, and to varying extents. We will review three such approaches here.<sup>8</sup>The first abandons the idea that the world of interpretation for an utterance is supplied as a parameter on the interpretation function, and instead assumes natural language to have the power of explicit quantification over worlds (and times) in the object language. This removes the need to raise a noun phrase out of the scope of an operator to yield a *de re* interpretation. The second and third continue to rely on movement to derive *de re* readings, but they provide more freedom with regards to the consequences of movement for quantificational scope.

### 5.1 Intensional variables in the object language<sup>9</sup>

Early work in temporal and modal logic, e.g., by Kripke and Prior, as well as in formal semantics for natural language (Montague 1974) treated times and worlds differently from individual variables. In particular, modal and temporal operators were seen as merely shifting the appropriate evaluation index on the interpretation function, while individuals could be quantified over in the object language. However, as was first argued for tense (Kamp 1971, Vlach 1973, Bentham 1977), and later generalized to worlds (Cresswell 1990) and situations (Kratzer 2007), there are examples which show that natural language has the expressive power of quantification over worlds and times (or situations) in the object language:

(43) There will be times such that all persons now alive will be happy at the first or miserable at the second.

(Cresswell 1990, p. 20)

(44) If it might have been that everyone actually rich was poor then the economy would have been in bad shape.

(Cresswell 1990, p. 38)

(45) If, whenever it snowed, it had snowed much more than it actually did, the town plow would have removed the snow for us.

(Kratzer 2007, ex. (23))

Roughly speaking, what these examples show is that even in the context of an intensional operator, we are able to make reference to times, worlds, or situations introduced at the level of a higher clause. For example, in (45), “we

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<sup>8</sup>Additional and more recent proposals include Sternefeld (2010), Romoli & Sudo (2009).

<sup>9</sup>This section is largely based on parts of section 2.2 of Schwarz (2012).



(36a) Mary thinks that everyone in this room is outside.

(48)  $\lambda w_0$  [Mary thinks in  $w_0$   
[ $\lambda w_1$  everyone in this room in  $w_0$  is outside in  $w_1$ ]]

Similarly, Fodor-style examples such as (41) with a quantificational narrow scope *de re* reading (Fodor’s ‘non-specific transparent’) are also captured:

(41) Mary wants to face a plumber next.

(49)  $\lambda w_0$  [Mary wants in  $w_0$   $\lambda w_1$  [to face (in  $w_1$ ) a plumber in  $w_0$  next]]

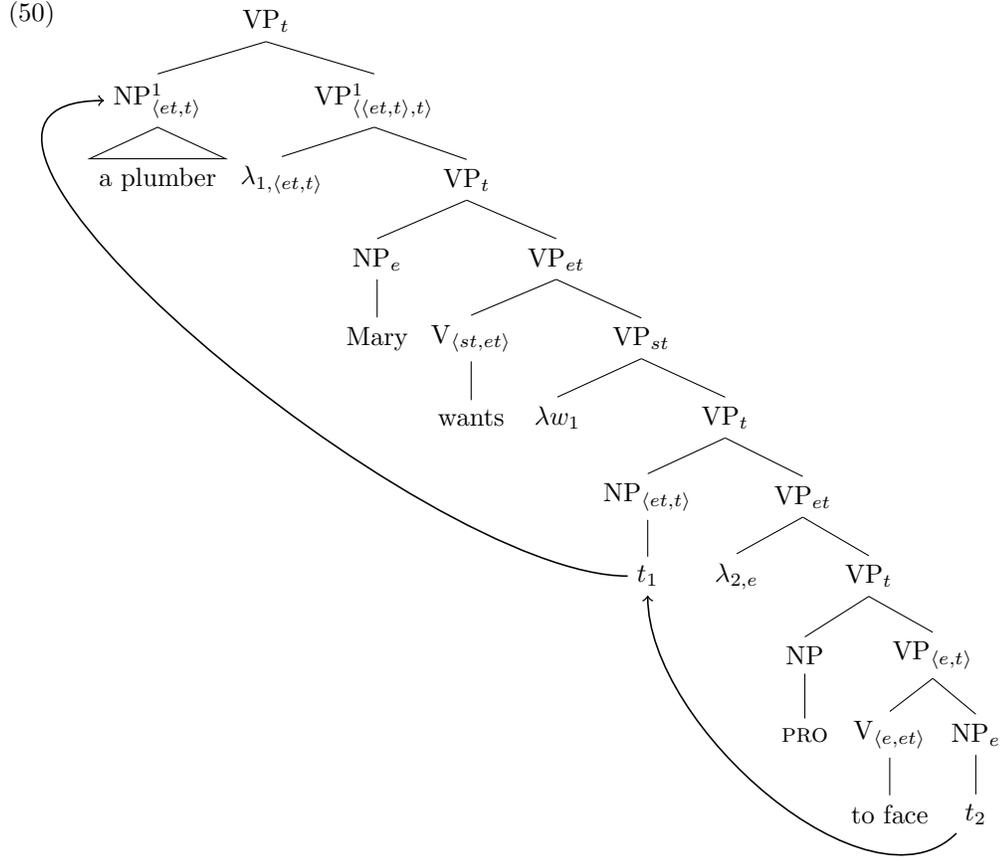
Thus, the option of binding a possible world pronoun in a noun phrase that relates it to an operator higher up in the structure provides the necessary disentangling of quantificational scope and intensional status to deal with the data that is problematic for a traditional scope theory.

## 5.2 A Scope Theory with Higher Type Traces

The next two approaches to be considered are variants of the scope theory, which turns out to be able to provide some leeway for disentangling scope and intensional status as well. The first, based on discussion by von Stechow & Heim (2008), modifies the assumptions about the semantic type of traces. While these are most commonly taken to be of type  $e$ , it is also possible to consider traces of other types (see also discussion in Heim & Kratzer 1998, pp. 212-213). In particular, we can consider leaving traces of type  $\langle et, t \rangle$ . When applying this to the Fodor-example in (41), as in the LF below, the result turns out to be a quantificational narrow scope *de re* reading.<sup>11</sup>

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<sup>11</sup>The additional step of quantifier raising within the embedded clause is needed to deal with the quantifier in object position; alternatively, one could assume higher-typed entries for the verb.



To see how this comes about, consider the composition of the crucial pieces at the top-most level:

$$(51) \quad [[VP^1]]^w = \lambda Q_{\langle et,t \rangle}. [[wants]]^w (\lambda w_1. Q(\lambda x_e. [[face]]^{w_1}(x)([[PRO]]^{w_1}))) ([[Mary]]^w)$$

$$(52) \quad [[NP^1]]^w = \lambda P_{\langle et,t \rangle}. \exists y [y \text{ is a plumber in } w \text{ and } P(y) = 1]$$

$$(53) \quad [[VP^1]]^w ([[NP^1]]^w) = [[wants]]^w (\lambda w_1. [\lambda P_{\langle et,t \rangle}. \exists y [y \text{ is a plumber in } w \text{ \& } P(y) = 1]] (\lambda x_e. [[face]]^{w_1}(x)([[PRO]]^{w_1}))) ([[Mary]]^w)$$

As can be seen in (53), even though the quantificational force of *a plumber* winds up in the scope of *wants*, the nominal predicate nonetheless gets interpreted

relative to the world of evaluation for the entire sentence. Thus, if we permit traces to have type  $\langle et, t \rangle$ , we can account for Fodor-style sentences within the traditional scope theory.

However, the other two problems above still remain: finite clauses and *if*-clauses will still require the noun phrase to be moved out of the relevant clause to get the reading in question. While it is in principle possible to relax constraints on movement for special cases (e.g., to derive *de re* readings), it is unclear whether that can be motivated on more general grounds. Be this as it may, the current extension shows that the scope theory is open to amendments that allow a partial disentanglement of scope and intensional status. The following section explores another proposal for doing so, which does not require relaxing constraints on movement for *de re* readings.

### 5.3 Split intensionality: a modern scope theory<sup>12</sup>

Keshet (2008*a*, 2011) attacks the problem of quantificational narrow-scope *de re* readings by taking a closer look at the interpretation of intensionality in general. If we start out from an extensional system and try to extend it minimally to incorporate intensions where needed, one straightforward approach is to use a rule such as Intensional Functional Application Heim & Kratzer (1998), which is basically a type repair strategy for intensionality: when a function (e.g., that introduced by a modal or attitude verb) requires an intensional argument but the syntax only supplies an extensional one, IFA shifts the type of the argument from an extension to an intension and then applies Functional Application as per usual. The main innovation of the system described in Keshet (2008*a*) and Keshet (2011) is that it introduces the type-shift in a separate step, namely through the insertion of the  $\wedge$  operator and a new rule:

(54) **Intensional Abstraction**

If  $\alpha$  is a branching node and  $\{\beta, \gamma\}$  is the set of its daughters, where  $\beta$  dominates only an  $\wedge$  operator, then, for any situation  $s$  and variable assignment  $g$ ,  $\llbracket \alpha \rrbracket^{s,g} = \lambda s' \in D_s . \llbracket \gamma \rrbracket^{s',g}$ .

(Modeled after Heim and Kratzer’s Predicate Abstraction, p. 186)

The operator  $\wedge$  may be inserted freely – if it yields a type mismatch, the derivation will simply fail. There is no longer a repair strategy when a function requires an intension but is supplied with an intension. Instead, the idea is that a derivation will only succeed if  $\wedge$  has already been inserted by the time the function takes its argument.

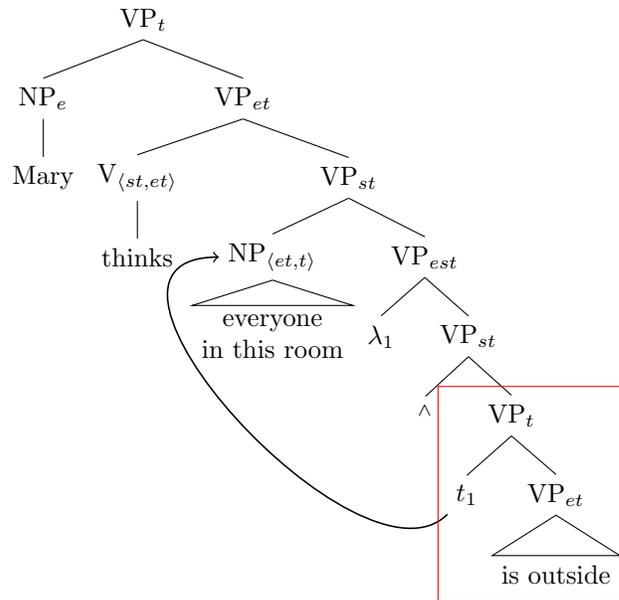
Giving the type-shifting operation a place in the structure that is furthermore separate from the intensional operator that required it in the first place makes it possible to raise a noun phrase to a position between the two. This has the effect that the intensional status of the noun phrase is not affected by the embedding, but its quantificational scope still is below the quantifier over worlds

<sup>12</sup>This section largely is a condensed version of the key sections in Keshet (2011).

introduced by the operator. This deals with all three problematic cases, as illustrated below. (Wide scope *de re* readings will continue to require movement out of the scope of the relevant embedding expression.)

**Finite Clauses** The first problem for the scope theory considered above, due to May (1977), was that quantificational noun phrases could never scope out of finite clauses as required for *de re* readings of sentences like (36a). Based on the new rule above, a *de dicto* reading of *everyone in this room* is derived when *everyone in this room* is below the  $\wedge$  and a *de re* reading is derived when this noun phrase is above the  $\wedge$ . But being above  $\wedge$  no longer requires outscoping the relevant embedding expression, as seen in (55). This option immediately solves May’s objection to the scope theory, since the syntactic movement involved is no longer illegal; as illustrated in (55), the *de re* noun phrase scopes above the new operator  $\wedge$ , but still within the finite complement:

- (36a) Mary thinks that everyone in this room is outside.  
 (55) Narrow Scope *De re* for *everyone in this room*:



A complete derivation for a sentence like (55) is shown in Keshet (2011), but here is a sketch of how it proceeds to illustrate the effect of  $\wedge$ : first, the  $\wedge$  applies to the VP, of type  $t$ , to form a node of type  $st$ . The subject *everyone in this room* moves above this node, first abstracting over a type- $e$  argument to form a node of type  $est$ . This node and the quantifier of type  $\langle et, t \rangle$  can compose using the semantic function *Combine* independently proposed in Büring (2005),<sup>13</sup> re-

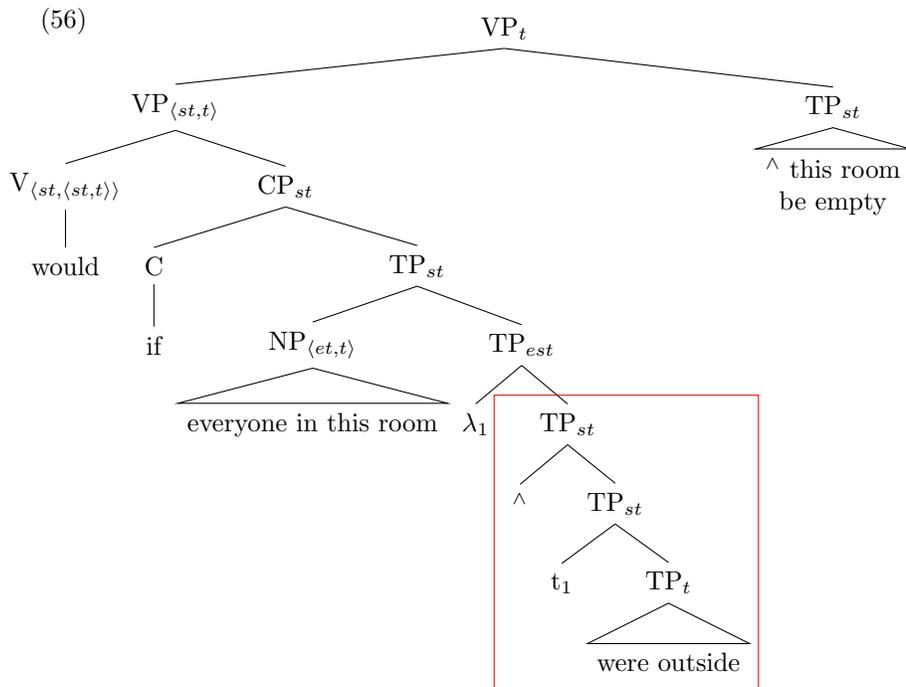
<sup>13</sup>Büring (2005) proposes a syntactic operator  $\kappa$  that allows the combination of a quantifier with a node representing any function requiring a type- $e$  argument. In short, the quantifier fills this open argument slot and the remaining arguments are passed up the tree.

sulting in another node of type *st*. Last, the verb *thinks* takes this type-*st* node as its argument.

**If-statements** The fact that under Split Intensionality a noun phrase *de re* relative to an intensional operator  $\omega$  can remain below  $\omega$  explains why its quantificational force can scope below that of  $\omega$ . Recall our counterexample (38) to the scope theory from section 4.2, repeated here:

(38) If everyone in this room were outside, it would be empty.

The original scope theory incorrectly predicts (38) to mean that for each person  $x$ , if  $x$  were outside, the room would be empty. Split intensionality, on the other hand, captures this case correctly. As shown in (56), inside the *if*-clause, the noun phrase *everyone in this room* has raised to a position above the  $\wedge$ . Only the items below  $\wedge$  (those in the box shown in (56)) are interpreted in the supposition worlds of the conditional. Since *everyone in this room* has moved out of this box, it is evaluated in the actual world, although it still scopes below the modal in terms of quantificational force.

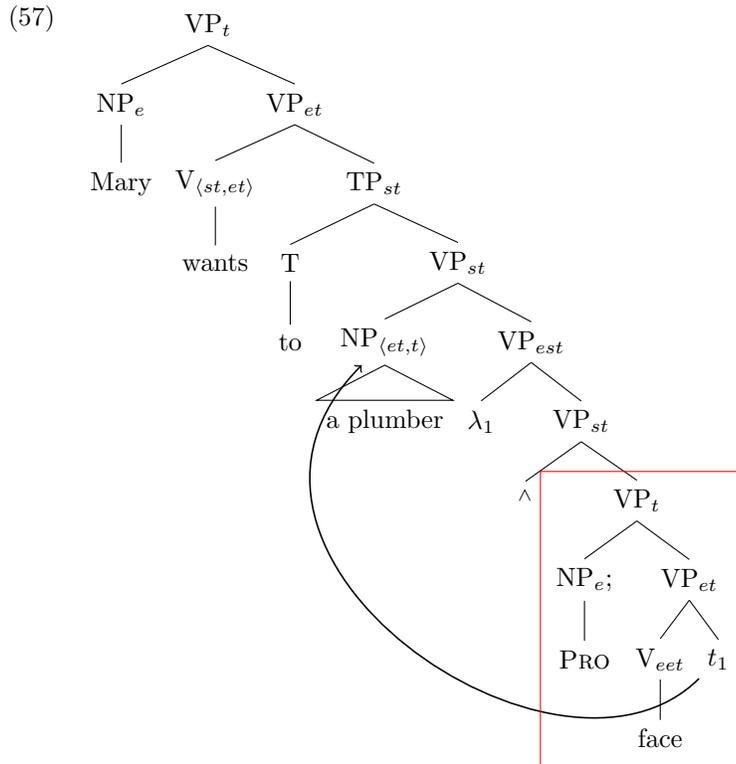


**Fodor's paradox** The split intensionality theory also captures the data discovered by Fodor:

(41) Mary wants to face a plumber.

As discussed above, (41) has a reading where the noun phrase *a plumber* is *de re*, in the sense that Mary does not know that the professionals she wants to face next are plumbers, but the noun phrase still takes scope below the verb *want* in the sense that there is no one single professional that Mary wants to face next.

This reading is not a problem in the split intensionality system, where a noun phrase may take quantificational force below an intensional verb  $\omega$  and yet still be interpreted *de re* relative to  $\omega$ . For instance, consider the structure in (57) and the corresponding truth-condition paraphrase in (58):



(58) In all of Mary's desire worlds  $w'$ , there's an  $x$  such that  $x$  is a plumber in the real world  $w_0$  and Mary faces  $x$  in  $w'$ .

So, the split intensionality system predicts that there should be a reading of this sentence where, as Fodor describes, there is no one particular plumber in the real world which Mary wants to face next and yet the description *plumber* holds (only) in the real world.

## 5.4 Differentiating the theories – empirical and conceptual considerations

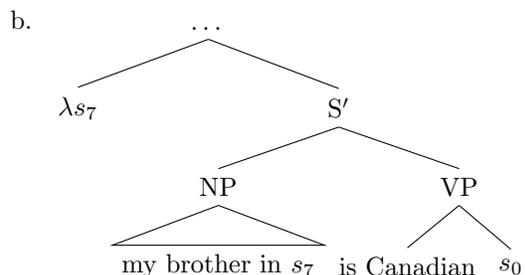
The two types of refined theories laid out above are equally successful in terms of the basic empirical ground they cover, in that they account for the three types of readings discussed in section 4. This raises the question of whether there are any differences between them that might inform a decision as to which version to adopt. Two main issues are relevant in this regard: first, *de re* readings are more constrained than a basic version of a theory that assumes possible world pronouns in the object language would predict. Secondly, the range of readings predicted by the split intensionality theory is more restricted than that of possible world pronoun theories when it comes to complex embedding environments.

### 5.4.1 Constraints on *de re* readings<sup>14</sup>

**Generalization X (Percus 2000)** While the expressive power gained by representing intensional variables in the syntactic structure allows us to capture transparent interpretations, the standard implementation of this turns out to introduce a problem of overgeneration, as was first discussed in detail by Percus (2000). In particular, if we assume that all predicates—including verbs — come with a syntactically represented situation pronoun,<sup>15</sup> we expect — barring further assumptions — transparent interpretations to be available for all predicates. This expectation is not borne out, however, as Percus shows in great detail.

A case in point are the situation pronouns introduced with verbal predicates. Percus provides the example in (59a) and considers the LF in (59b).

(59) a. Mary thinks my brother is Canadian.



On the given indexing of the pronouns, “we would take the sentence to be true whenever there is some actual Canadian who Mary thinks is my brother – even when this person is not my brother in actuality, and even when Mary mistakenly thinks that he is not Canadian” (Percus 2000, p. 200). However, in

<sup>14</sup>This subsection is largely based on section 2.3 of Schwarz (2012).

<sup>15</sup>Since the relevant literature frames these issues in terms of situation pronouns, we will adopt that terminology here as well. Situations are generally taken to be parts of worlds by the relevant authors, following (Kratzer 1989).

such a situation we clearly judge the sentence to be false, which shows that the indexing in the LF in (59b) is not available. Percus concludes that there is a general constraint on the interpretation of situation pronouns introduced with verbal predicates, which he labels ‘Generalization X’:<sup>16</sup>

- (60) *Generalization X*:  
The situation pronoun that a verb selects for must be coindexed with the nearest  $\lambda$  above it.

(Percus 2000, p. 201)

**Generalization Z and the Intersective Predicate Generalization** Building on Percus’s insights, Keshet (2008*a*, 2010) discusses a further constraint on the interpretation of situation pronouns, which concerns the distinction between weak and strong noun phrases. As is standard, weak noun phrases are understood to be precisely those that can appear in existential *there* constructions, following Milsark (1977). The starting point for this line of thought comes from Musan (1995), who showed that not all noun phrases display temporal independence (contra Enç 1986):

- (61) a. Every fugitive is in jail (again).  
b. #There is a fugitive in jail (again). (Musan 1995, Kusumoto 2005)
- (62) Some members of congress knew each other in college. In fact, ...  
a. ...three U.S. Senators were attending Harvard together in 1964.  
b. #...there were three U.S. Senators attending Harvard together in 1964.

(Keshet 2008*a*, adapted from Musan)

The contrast observed in both of these pairs of examples is that while the (a)-sentences have a perfectly reasonable interpretation, which comes about by interpreting the nominal predicate at a time different from that of the verbal predicate in its clause, the existential *there* variants in (b) have no sensible interpretation. (61b) is contradictory, and the continuation in (62b) only has the implausible interpretation that the relevant individuals were senators while attending Harvard in 1964.

Keshet (2008*a*, 2011) furthermore showed that this effect, too, is paralleled in the domain of possible worlds (or situations):

- (63) a. Mary thinks that someone in this room is outside.

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<sup>16</sup>Percus also makes a parallel point for adverbs, based on parallel data, which won’t play a central role in our discussion:

- (i) *Generalization Y*:  
The situation pronoun that an adverbial quantifier selects for must be coindexed with the nearest  $\lambda$  above it.

(Percus 2000, p. 204)

- b. #Mary thinks there's someone in this room outside.
- (64) a. Mary thinks three professors are (still) in college.  
 b. #Mary thinks {there's/ there are} three professors still in college.  
 (both examples from Keshet 2008*a*, p. 48)

Both (63b) and (64b) are odd in that they can only be understood as attributing inconsistent (or implausible) beliefs to Mary, unlike their counterparts in the (a)-sentences. This shows that the predicates of weak noun phrases have to be interpreted relative to the same situation as the verbal predicate in their clause, i.e., in Mary's 'thought-worlds' in the present sentences. Keshet proposes to add a further generalization based on these findings:

- (65) *Generalization Z:*  
 The situation pronoun selected for by a noun in a weak NP must be coindexed with the nearest  $\lambda$  above it. (Keshet 2008*a*, p. 126)

Following Milsark (1974), the interpretation of the existential *there*-construction can be seen as involving intersection of the two predicates and existential closure over the resulting property (see Keshet 2010, for details and a modern implementation of Milsark's idea). Adopting the proposal by Landman (2004) that weak noun phrases in general denote predicates, Keshet (2010) argues that Generalization Z is a special case of a more general constraint that requires any two predicates that are interpreted intersectively to be evaluated relative to the same world and time (or situation):<sup>17</sup>

- (66) *Intersective Predicate Generalization (IPG):*  
 Two predicates interpreted intersectively may not be evaluated at different times or worlds from one another.  
 (Keshet 2010)

Keshet (2008*a*, 2010) presents evidence for this with examples involving nouns and their modifiers, the *have*-construction, and depictives. Take the following examples of the first case as a brief illustration:

- (67) a. #In 1964, every U.S. Senator at Harvard got straight A's.  
 b. #Mary thinks the married bachelor is confused.  
 (Keshet 2010)

In (67a), the noun *U.S. Senator* and the prepositional phrase *at Harvard* are interpreted intersectively, and the sentence only has a reading where the relevant individuals were senators and at Harvard at the same time. Similarly, the adjectival modifier *married* and the noun *bachelor* are interpreted intersectively, and (67b) can only be interpreted as attributing inconsistent beliefs to Mary.

The upshot of this discussion is that accounts that posit intensional variables in the object language face a problem of overgeneralization. Assuming that all

<sup>17</sup>Note that relative clauses constitute an important exception to this generalization (as Keshet points out as well).

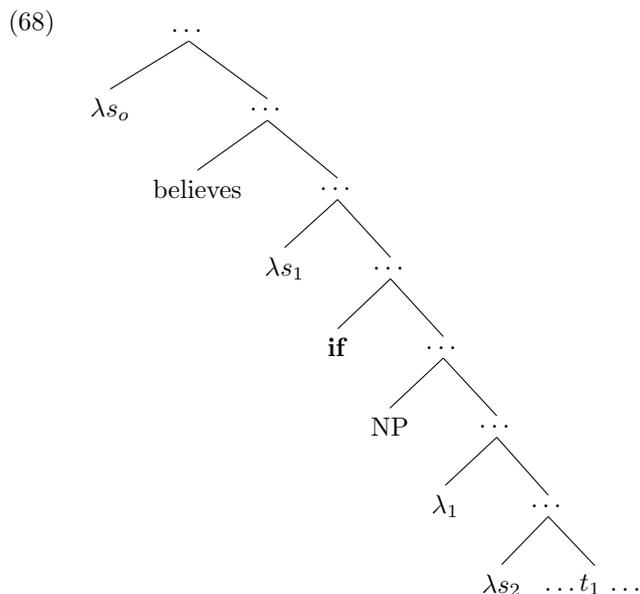
predicates that have a semantic situation argument (*can*) take a situation pronoun as a complement predicts unattested readings, as — descriptively speaking — the situation pronouns of verbs and weak noun phrases need to be bound by the closest  $\lambda$ -abstractor (Generalizations X and Z, Percus 2000, Keshet 2010). Furthermore, intersectively interpreted predicates have to be interpreted relative to the same situation (IPG, Keshet 2008*a*, 2010).

But note that these problems only arise if we do indeed assume that all predicates (*can*) combine with a situation pronoun. One possible variation of this type of account, proposed by Keshet (2008*c*) and Schwarz (2012), is that situation pronouns have a more restricted distribution and only are introduced as arguments of strong determiners. This accounts for the generalizations considered above. Furthermore, Schwarz (2009, 2012) argues that situation pronouns introduced by strong determiners also are behind standard effects of quantificational domain restriction (von Stechow 1994). It thus seems possible to amend this type of account in an independently motivated way so as to avoid the problems of overgeneralization reviewed above.

Turning to the split intensionality theory, the relevant problems of overgeneration do not arise. Given that it ties all *de re* readings to movement, only expressions that can move will have such readings. This straightforwardly accounts for Generalization X (and Y), since verbs (and adverbs) do not undergo movement. It also accounts for Generalization Z (and the IPG) if we assume that weak quantifiers denote properties (Landman 2004), and that no movement is possible out of noun phrases.

#### 5.4.2 Complex embeddings

Another difference between the split intensionality theory and one based on intensional variables in the object language concerns the predictions for complex embedding environments with multiple intensional operators, at least to the extent to which we maintain the assumption that covert movement is constrained in the same (or very similar) ways as overt movement. On the split intensionality theory, a noun phrase can raise to the edge of a syntactic island but not further. This predicts that in cases where the island is itself embedded, the only *de re* reading available to it is one that is relative to that embedding operator. Schematically, using an *if*-clause island:



The nominal predicate in the noun phrase here can thus be interpreted relative to the lower-clause *if*-situations ( $s_2$ ) — if the noun phrase doesn't raise — or the *think*-situations ( $s_1$ ) — if it does raise —, but not the situations relative to which the entire sentence is evaluated ( $s_0$ ), as far as the split intensionality theory goes. In contrast, on accounts using syntactically represented situation pronouns, it can be interpreted relative to any situation variable corresponding to a *c*-commanding  $\lambda$ -binder.

Keshet (2008a, 2011) claims this as a feature of the split intensionality theory, citing several cases where a *de re* reading is disallowed from within a syntactic island. For instance, consider the sentence in (69a), which receives a plausible interpretation only when the noun phrase *every paper John wrote* is interpreted *de re* relative to the verb *thinks*. For instance, the sentence is true in a scenario where John turns in a series of papers but the teacher suspects that Sally had written them for John. Compare this to (69b), which receives no plausible interpretation:

- (69) a. The teacher thinks that Sally wrote every paper John wrote.  
 b. # The teacher thinks John should be punished because Sally wrote every paper John/he wrote.

The implausibility of (69b) comes from the fact that two people cannot both be the sole author of a paper. (For instance, the same sentence except ending with *... every paper John turned in* sounds fine.) Now, if *every paper John wrote* could be interpreted *de re* relative to the verb *think* in (69b) as it is in (69a), the sentence would not be a contradiction.

In addition to these cases, though there are also some cases that seem to contradict the prediction that islands restrict *de re* readings of noun phrases.

Consider the following sentence in the described scenario:

- (70) a. **Scenario:**
- i. *Acutally in Room A*: John, Bill, and Sue
  - ii. *In Room A in Mary's belief-worlds*: John, Sam, and Ann
- b. Mary doesn't believe that if everyone in Room A were outside, the room would be empty.  
(She believes that if John, Sam and Ann were outside, it would be empty!)

This sentence can be regarded as true in the scenario, without any unreasonable assumptions about Mary's state of mind. But this requires *everyone in this room* to be interpreted relative to the situation in which the entire sentence is evaluated. Otherwise, Mary would be described as not believing the obvious, loosely speaking.

A possible reply for the split intensionality theory would be to claim special status for the overall world (or situation) of evaluation. This could be seen as part of the overall information about the utterance context, parallel to the way other information about the utterance context, such as who the speaker is, is generally assumed to be available via parameters on the interpretation function. (Note that such a move would also necessitate an independent explanation for (69b).) But this move will not generalize to even more complex embeddings, since there we can consider cases where a noun phrase is evaluated relative to a non-global situation that is still out of reach, as it were, for scope-based accounts (again, assuming standard constraints on movement). Empirically, this gets harder to evaluate, but the following is an attempt at construing such a case:

- (71) **Scenario:**
- a. *Acutally in Room A*: John, Bill, and Sue
  - b. *In Room A according to Al's report*: John, Bill, and Sam
  - c. *In Room A in Mary's belief-worlds*: John, Sam, and Ann
  - d. *Mary's belief as stated in Al's report*: If John, Bill, and Sam were outside, Room A would be empty.
- (72) According to Al's report, Mary believes that if everyone in Room A were outside, the room would be empty.

Taking the phrase *according to Al's report* to shift the world of evaluation for the rest of sentence, this sentence involves three separate modal quantifiers. Crucially, though, the noun phrase *everyone in Room A* is within an island for movement below the lowest of these intensional operators. If the sentence can serve as an adequate description of the described scenario, then that is the case where the split intensionality theory undergenerates, unless it drastically relaxes the relevant constraints on movement. Situation-pronoun accounts, on the other hand, face a problem of overgeneration if the sentence cannot adequately describe the provided scenario. Settling the empirical question here will require

more attention than we have space for here. We'll contend ourselves with having sharpened the difference between the two types of accounts for now.

Relying on movement for *de re* readings while maintaining standard assumptions about constraints on movement commits the modern scope theory to various other predictions. Indeed, Keshet (2011) discusses various island-related phenomena that arguably support these predictions. At the same time, however, there are other examples that seem more at odds with these predictions. For example, the expressive power arguments by Cresswell (1990) and Kratzer (2007) would seem to involve dependencies between a noun phrase's world (or situation) variable and embedding operators or binders that should be out of reach from the scope theory's perspective. To adapt an example from (Cresswell 1990, who in turn attributes it to Angelika Kratzer (p.c.); also see Kratzer 2007, Elbourne 2013 for further discussion of related examples), consider the following:

- (73) If George W. Bush had written some novels, but his lawyer Smith believed that a New York Times review alleged that John Grisham had written every novel Bush had (actually) written, Smith would certainly sue the Times.

Crucially, it seems possible here to refer back to the novels introduced in the *if*-clause from inside the disjunction in the most embedded clause. And while Keshet (2011) argues that conjunctions do exhibit island effects and thus do not allow for *de re* readings, the following variant of an example by (Elbourne 2013, who in turn built his on Kratzer 2007 and Cresswell 1990) does seem to permit a *de re* reading for a noun phrase appearing inside of a conjunction:

- (74) If Bush had written some novels and composed some songs, and the New York Times had alleged that John Grisham had written every novel that Bush (actually) had and composed every song that Bush (actually) had, Bush would sue the Times.

Finally, yet another difference between scope-based and pronoun-based accounts related to examples like these concerns a possible independent use of situation pronouns, particularly for domain restriction. Most recently, Schwarz (2009, 2012) as well as Elbourne (2013) argue that situation pronouns provide all we need to account for nominal domain restriction (also see Recanati 1996, 2004, Kratzer 2004, 2007, among others), which furthermore provides an account of donkey sentences with definites. While a more detailed review of these phenomena would lead us to far astray, any independent motivation for the presence of situation pronouns in the syntax would of course bolster pronoun-based account (though if there are remaining problems of overgeneration, these of course will still have to be thrown into the mix for an overall evaluation).<sup>18</sup>

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<sup>18</sup>One more case where Keshet (2011) admits that the the split intensionality theory breaks down involves definite descriptions, which seem to be able to refer to salient times, even those described in separate sentences. For instance, in the last sentence of (i), the term *that five-year-old girl* refers to someone who is clearly no longer five years old. And yet, no tense in the

## 6 Further Issues

### 6.1 More on the relation between scope and intensional status

One of the main lines of argument in the literature, as well as of the present paper, has been that the connection between quantificational scope and intensional status posited in the traditional scope theory is too strong, in that it predicts a perfect correlation between the two. Both of the refined theories considered above loosen the connection, but only to a certain extent. Essentially, they transform a biconditional dependence into a conditional one: *de re* no longer implies wide quantificational scope, but wide quantificational scope still implies *de re*. In other words, wide scope *de dicto* readings still are predicted to not exist by these theories. While this is assumed to be empirically adequate in much of the literature (e.g., Percus 2000, von Stechow & Heim 2008), Fodor (1970) claimed that a fourth reading (non-specific opaque in her terms) of sentences like (75) exists.

(75) Mary wants to buy an inexpensive coat.

Under such a reading, as Fodor puts it, there is a particular coat that Mary wants to buy and that she wants to buy under the description *an inexpensive coat* (see Fodor (1970), p. 227). In this case, it is not necessarily true that the coat in question is actually inexpensive. This seems like a reasonable idea to express, and in fact this is what (76a) means. However, it does not seem like (75) can really mean that, if we consider (76b). The use of the word *it* in the second sentence of (76b) forces a specific reading of *an inexpensive coat* (see Ioup 1975). However, once this reading is forced, it is impossible to deny that the coat is inexpensive.

- (76) a. There's a coat that Mary wants to buy. She thinks it is inexpensive. But really, it is quite expensive.  
b. Mary wants to buy an inexpensive coat. #But really, it is quite expensive.

More recently, Szabo (2010) has provided another set of cases that he argues to support the notion of a fourth reading. First, he suggests the contrast between (76a) and (76b) is due to the presence vs. absence of *think*, and points to the fact that (77) seems to work just fine:

(77) Mary thinks she bought an inexpensive coat. It is actually quite expensive.

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same sentence refers to a time when the woman was five years old – this description crucially relies on a time described in a previous sentence.

- i. In 1980, I visited my friend Joanne. I met her two-year son and her daughter, who was three years older. Last year, I watched that five-year-old girl graduate from medical school.

The felicity of this example leads Szabo to claim that “If there is no such thing as a specific opaque [wide-scope *de re*, in our terms] reading, the contrast is a bit of a mystery” (Szabo 2010, p. 34). However, one possible solution to this mystery would be to see it as a case of accommodation – unless Mary is known to be delusional, her belief about having bought something that she thinks is an inexpensive coat quite likely will lead a hearer to conclude that there indeed is a coat that she bought, which might suffice to license pronominal reference. Thus, the availability of *it* would not be due to a wide scope LF, but due to pragmatic reasoning.

While more might need to be said about this, let us briefly mention another type of example, the main one in Szabo’s paper, which he labels as summative reports. It is based on a scenario where police show a paranoid person, Alex, a large number of photographs of people from his neighborhood, his task being to identify the ones that he thinks are terrorists, and to specify where they live. Alex is not keeping count of his allegations, but one of the police officers later tallies up Alex’s input in the following way:

(78) Alex believes that eleven terrorists live across the street from him.

This, Szabo claims, should be seen as a wide-scope *de dicto* case, as Alex has no belief about the number of terrorists he identified to be living across the street. Parallel examples with various other quantifiers, including the strong *most*, are also provided by Szabo. If these are indeed instances of wide-scope *de dicto* readings, this has serious theoretical consequences, since the main theories reviewed here exclude the possibility of such a fourth reading. Szabo lays out a proposal in terms of split quantifiers, where the quantifier head and its nominal complement can wind up scoping separately. While we cannot go into further details here, we’d like note that there may be reason to be skeptical about the conclusion that these cases — felicitous as they are — indeed instantiate genuine wide-scope *de dicto* readings. In particular, the summative examples seem to turn on the imperfections of our belief states. If there are 11 individuals of whom Alex believes that they are terrorists that live across the street, then the embedded clause of (78) logically follows from what he believes, regardless of whether he’s aware of the count. And if Alex is at all rational, despite his paranoia, he would have to agree with (78) if he reflected on his individual beliefs. So there’s a sense in which the sentence in question conveys something along the lines of ‘it logically follows from what Alex believes that there are eleven terrorists living across the street from him.’ But then the exceptional nature of these summative reports with respect to scope and the *de re* / *de dicto* distinction may be due to the nature of beliefs, and not the existence of wide-scope *de dicto* LFs. More cases, both involving logical properties like counting and other ones, should be looked at. Note also that even if we follow Szabo’s line of argument, the absence of a wide-scope *de dicto* reading for (75) would still need to be explained.

## 6.2 *de re* / *de dicto* beyond noun phrases<sup>19</sup>

Our focus here has been on the scope and intensional status of noun phrases, following the bulk of the literature. However, there are other types of expressions that exhibit similar — and perhaps exactly the same — phenomena. The following illustrates with some examples, without going into any serious level of analysis.

**Comparatives** One classical case, noted early on by Russell (1905), involves a comparative and a *than*-clause:

(79) Bill thinks that my yacht is longer than it is.

For the sensible interpretation of this sentence on which Bill is not holding incoherent beliefs, the predicate in the *than*-clause has to be interpreted relative to the actual world, whereas the predicate in the main clause has to be interpreted relative to the *thought*-worlds. Based on this and similar examples with counterfactuals, von Stechow (1984) has argued that to account for the full range of data, we have to allow for *de re* interpretations of predicates in the *than*-clause (to allow for an interpretation of the predicate relative to the actual world even though it remains in the scope of the intensional operator at LF).

**Relative Clauses** Another case, somewhat intertwined with noun phrases, where we observe similar phenomena is that of relative clauses. In the temporal domain, it has been argued that the tense in a relative clause does not have to be interpreted relative to the tense in the matrix clause, even when the noun phrase containing it has to take scope below the matrix verb (which rules out a scope account, as shown by Kusumoto 2005). The following example is an illustration of this so-called later-than matrix interpretation:<sup>20</sup>

(80) Hillary married a man that became president.

Kusumoto (2005)

The fact is, of course, that Bill only became president after he married Hillary, which means that the past tense on *became* has to be interpreted relative to the time of utterance, rather than relative to the time introduced by the past tense on *married*. Thus, it is possible for the relative clause to be evaluated relative to the utterance time (or situation), even though it occurs in the scope of a temporal operator (the matrix tense).

One set of data that suggests that relative clauses have special properties with respect to their intensional status as well is the following (Schwarz 2012, building on observations by Breheny 2003). Note that pronominal modifiers and relative clauses that — on their simplest analysis — should be equivalent to them differ in terms of their behavior in intensional contexts such as the one created by *fake*:

<sup>19</sup>This section has been adapted from section 5.3 of Schwarz (2012).

<sup>20</sup>This example alone doesn't rule out a scopal account. Kusumoto (2005) argues that certain variants do, but see Keshet (2008b) for a rebuttal.

- (81) a. A fake American philosopher was at the conference.  
b. A fake philosopher that is American was at the conference.

Only (81a) is compatible with a scenario in which the person in question is a real philosopher that pretends to be American. Once again, this suggests that the intensional status of an expression in an embedded position can be independent of its immediate embedding operator.

**De Re Verbs?** As discussed in section 5.4.1, Percus (2000) argued that *de re* readings are unavailable for verbal predicates (Generalization X). More recently, though, Cable (2011) has argued that at least in certain cases, it seems as if verbs indeed can be interpreted *de re*. He imagines a situation where we are regularly practicing a juggling routine. Our friend Mary only knows that we are practicing some kind of act at the given time. One day, she thinks we're at practice, although we actually decided to skip it last minute. He then observes that this can be characterized as follows:

- (82) Mary thinks we're juggling right now.

But this requires a *de re* interpretation of *juggling*. Interestingly, however, it need not necessarily contradict Generalization X. In short, Cable points out that the relevant reading can be paraphrased as follows:

- (83) Mary thinks we're doing (our daily) juggling right now.

He then goes on to argue that the availability of a *de re* reading for (82) in fact provides evidence for a compositional analysis of verbs like *juggle*, as *do + NP*. Thus, what looked like a case of verbal *de re* may boil down to the usual *de re* noun phrase, at least underlyingly.

### 6.3 Broader Relevance

Beyond its obvious importance in semantic theory, the *de re* / *de dicto* distinction can have significant practical consequences, e.g., in the interpretation of law. Anderson (2013) details several important misunderstandings in English and American case law involving intensional contexts. One particularly egregious example is the case of *Whiteley v. Chappell*, brought against a defendant who pretended to be a deceased neighbor of his in order to vote.<sup>21</sup> The relevant voter fraud statute at the time prohibited “[im]personat[ing] any person entitled to vote.”<sup>22</sup> The court found the defendant not guilty because the person he impersonated was not a “person entitled to vote,” being dead. Anderson details how this precedent became famous as an example of taking a statute (allegedly) quite literally, instead of invoking what was clearly the spirit of the legislation.

<sup>21</sup>(1868) L.R. 4 Q.B. 147

<sup>22</sup>*Id.*, 147. Note that here we seem to be dealing with a transitive verb creating an intensional context for its object NP, without the overt presence of a clause, similar to Quine's (10). Regardless of the particular analysis of such cases, we are looking at a version of the *de re* / *de dicto*.

As Anderson points out, though, the dichotomy is not actually between the literal meaning and the spirit of the law, but rather between two literal meanings: one *de re* and the other *de dicto*. The reading the court based its decision on (and the one later labelled the “literal” meaning) was *de re*: the statute would only be violated if there was an actual person entitled to vote such that the defendant impersonated that person. However, the equally “literal” *de dicto* reading would prohibit anyone from pretending that they were entitled to vote, even without necessarily impersonating any particular person so entitled. This meaning also happens to accord more closely to the apparent spirit of the statute.

As a much more recent example, Anderson (2013) recounts the case against the accounting firm Arthur Anderson, which served as auditor to the bankrupt energy company Enron while they engaged in some (fraudulently) creative book-keeping.<sup>23</sup> Anticipating the potential, but still future, legal action against them, Arthur Anderson destroyed incriminating evidence up until the date when they received a subpoena. The relevant statute, paraphrased by Anderson (2013), prohibited anyone from “corruptly endeavor[ing] to influence the due administration of justice” (p. 25). Arthur Anderson was found not guilty because, before the investigation began and a subpoena was issued, there was no existing instance of “administration of justice” for the firm to endeavor to influence. This is obviously the *de re* interpretation of the statute, requiring a particular investigation to exist in order for the law to hold. Of course, though, there is a rather sensible *de dicto* reading, too, in which any attempt to obstruct justice — even in the absence of a particular existing investigation — would be covered by the law.

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<sup>23</sup>Arthur Andersen LLP v. United States, 544 U.S. 696, 698702 (2005).

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