The semantics, syntax, and morphology of Transparent Free Relatives revisited; a comparison of two approaches*

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ABSTRACT

This article proposes to go beyond the earlier literature on Transparent Free Relatives (TFRs) by pursuing three interrelated goals:

(i) To provide a sharper descriptive and analytical characterization of the semantic and pragmatic distinctions between TFRs on the one hand and Free Relatives (FRs) with a comparable internal configurational structure on the other.

(ii) To provide for a number of representative sub-kinds of TFRs a compositional semantics substantially more detailed and precise than has previously been offered (in particular, in Grosu 2003, section 6).

(iii) To carry out a comprehensive comparison of two views of the configurational structure of TFRs, by examining the extent to which each of them can deal with the syntactic, morphological, semantic and pragmatic properties of TFRs.

1. Introduction

Free relatives (FRs), illustrated by English data like those in (1) and (2), have been the object of a considerable amount of attention in the theoretically-oriented literature of the last half-century or so. A partial list of pertinent references that addressed their configurational syntax and the morphology of their left periphery is: Bresnan & Grimshaw (1978), Groos & van Riemsdijk (1981), Harbert (1983), Suñer (1984), Larson (1987, 1998), Grosu (2003, Part 1), and van Riesdmijk (1998, 2006b), all of which addressed primarily the syntactic and morphological properties of FRs; a partial list of references that focused primarily on their semantics is Jacobson (1988, 1995), Dayal (1997), von Fintel (2000), Tredinnick (2005), Condoravdi (2008), Lauer (2009), and Hinterwimmer (2013).

(1) a. I received [*what* you sent me __].
b. He is [*what* his mother always hoped he would eventually be __] (e.g., highly successful).
c. He lives [*where* his parents once lived __].

(2) a. He admires [*whatever (proposals)* he does not understand __].
b. He can be [{*whatever, however provocative*} he is asked to be __].
c. He is willing to live [{*wherever, in whichever cities*} his parents once lived __].

As may be seen in the above examples, English FRs may be initiated either by 'plain' *wh*-pronouns, as in (1), or by *wh+ever* pronouns or phrases, as in (2), and the 'gap' of these pronouns/phrases may be found in argumental, predicative, or adverbial positions, as in the (a), (b), and (c) sub-cases of (1)-(2) respectively.

At the beginning of the ninety-seventies, two Japanese linguists (Nakau 1971 and Kajita 1977) drew attention to a construction that has the superficial appearance of a certain subtype of FR, but differs from homonymous FRs in syntactic and (intuitively perceived) semantic and pragmatic properties. This construction was brought to the attention of the Western world by McCawley (1998, pp. 757-8, who summarized the relevant portions of Kajita (1977), and formed the object of intensive investigations that began with Wilder (1998), who dubbed it 'Transparent Free Relative' (TFR). Illustrations of TFRs (= (5a) and (6a-b) in McCawley 1998, Chapter 22, with inconsequential adaptations) are provided in (3).

(3) a. The man entered the cockpit carrying a gun and a can of
[*what* the crew took [$_{ZP}$ t to be **gasoline**]].
b. He was always [*what* might have seemed to strangers [$_{ZP}$t **a little odd**]].
c. He was behaving [*what* I could only describe [$_{ZP}$ t as **strangely**]].

The FRs with which TFRs are potentially homonymous have the following observable properties: (i) the initial wh-phrase is always the plain wh-pronoun *what*, and (ii) the 'gap' of *what* is always in the subject position of a copular construction, as in (3a), or of a small clause, as in (3b,c); for convenience, I will refer to this copular construction / small clause as 'ZP.'

The remainder of this paper is organized as follows. Section 2 presents a partial informal characterization of the ways in which TFRs and FRs with the properties in (i)-(ii) can be distinguished, and spells out the principal goals of the paper. Section 3 undertakes a preliminary and minimally formal comparison of two analytical approaches to TFRs that were adopted in earlier literature. Sections 4 and 5 present and defend compositional semantics for *what*-FRs and for a number of sub-types of TFRs respectively, relying on one of the two approaches described in section 3, and bringing out analytical differences between the two constructions. Section 6 extends the comparison of the two approaches by taking into account the results of sections 4 and 5. Section 7 summarizes the ways in which the goals indicated in section 2 have been carried out.

2. Some distinctions between TFRs and comparably structured FRs

TFRs and FRs with the properties (i)-(ii) of the preceding section are distinguishable in a number of ways. I provide preliminary characterizations of

two of them here, and will return in greater detail to these and other distinctions throughout this article.

One distinction concerns the intuitively perceived semantics/pragmatics of the two constructions, which can be appreciated by comparing (3a) with its slightly different variant (3a'), assuming specific contexts.

(3) a'. The man entered the cockpit carrying a gun and a can of
[*what* the crew had earlier assumed [$_{ZP}$ t was gasoline]].

Assume for (3a') the following context, which favors an FR construal: The crew had earlier seen another can that contained black beer and had incorrectly assumed it was gasoline. In this context, (3a') is naturally paraphraseable as in (4b). The FR denotes a contextually unique substance, and is paraphraseable with a definite expression, as FRs typically are (Jacobson 1988, 1995); I return to the issue of the inherent definiteness (defended by Jacobson in these works) in more detail in section 3.2. In contrast, the intended construal of the bracketed expression in (3a) is as denoting a substance whose precise nature is left open, and which the crew assumed (correctly or incorrectly) to be gasoline. That is to say, the TFR presents the content of the can **under two 'guises'**: gasoline, according to the impressions of the crew, and some unspecified substance, which may or may not be gasoline, insofar as the speaker explicitly reveals. In view of the absence of any presupposition about the denotatum of the TFR, this TFR is most naturally paraphraseable with an indefinite expression, as in (4a).

(4) a. ...*something* that the crew took to be gasoline (but which may or may not have been gasoline).
b. … *that* which the crew had earlier (incorrectly) assumed to be gasoline (i.e., black beer).

The point just made can in fact be demonstrated in relation to a single ambiguous example, in particular, (5a), whose FR and TFR construals are most naturally paraphraseable as in (5b) and (5c) respectively.

(5) a. Alex bumped into [*what* he thought was a dog].
b. Alex bumped into *that* which he thought was a dog.
c. Alex bumped into *something* that he thought was a dog.

Assume that Alex in effect bumped into a cat. The FR reading of (5a) arises if, e.g., Alex went temporarily insane and believed that some particular cat was a dog. The TFR reading arises if, e.g., Alex had poor vision and the speaker leaves it open whether what Alex bumped into was a dog of something else.

The choice of the appropriate paraphrase for data like (3a) and (3a'), shown in (4a-b) respectively, seems to be traceable to a principle that Heim

(1991) dubbed 'Maximize Presupposition', and which is arguably responsible for the distinction in felicity between, e.g., *the sun is shining* and *#a sun is shining*, in a context where *sun* purports to refer to the unique star at the centre of our solar system. Given the assumption that our system includes only one sun, the definite sentence captures this presupposition, and its indefinite counterpart does not. A comparable effect can be detected in the two versions of *we will never find out who {the, #a} killer of Bill is* (an example brought up by an anonymous reviewer), in a context where it is presupposed that Bill was killed (i.e., he did not die of natural causes) and that his killer was unique. The indefinite version can be improved only if the presupposition of uniqueness is given up and *a killer of Bill* can be construed as *one of Bill killers*.

Turning now to the ambiguous data considered above, and focusing on (5a), the FR construal presupposes a unique denotatum for the bracketed expression, as well as the fact that it is a cat, thereby licensing and requiring the definite paraphrase in (5b). In contrast, the TFR construal presupposes nothing about the denotatum of the bracketed constituent (beyond the contextual implication that it must be something one can bump into, and thus not, e.g., a prime number), not even atomic uniqueness, since the following continuation is possible: … *but it was in fact two cats standing next to each other*. Accordingly, the paraphrase in (5b) is not licensed, and only the weaker one in (5c) is possible.

I propose to view the 'double-guise presentation' of something, **one guise being unspecified and free of presuppositions**, as a necessary and sufficient condition for TFR status, and arguably as the very *raison d'être* of TFRs. In contrast, FRs are subject to no such condition, as can easily be seen by examining the data in (1). To forestall any possible misunderstanding, I note that the non-specification requirement concerns the content of the TFR and its assumed prior context, but does not prevent subsequent specification, as brought out by the fact that (3a) can be continued, without contradiction, by, say, … *but which subsequently turned out to be plain water*; similarly, the TFR construal of (5a) can be continued with … *but it was in fact a cat*. Hoever, if a precise specification of the matrix guise is provided in the prior context, as in: *After Mary arrived in Leiden, she immediately started admiring [what she wrongly believed to be Amsterdam]*, the bracketed constituent needs to be viewed as an FR.

A second difference between TFRs and FRs, and in particular, FRs with the special structural properties of TFRs (i.e., an initial *what* with the gap as subject of a ZP), may be described as follows: While a number of syntactic and/or semantic properties of FRs are partly or fully determined by corresponding properties of the wh-phrase, in TFRs, it is the non-subject of ZP that induces such effects. This distinction can be appreciated by contrasting the (a) and (b) subcases of (6)-(7) (adapted from McCawley 1998, p. 758); the bracketed expressions in the (a) sub-cases are FRs, those in the (b) sub-

cases are TFRs. The contrasts in matching properties illustrated in (6)-(7) concern syntactic number and syntactic category respectively.

(6) a. [**What** I read last summer] {was, *were} written by Dickens and Hemingway. ← **FR**
b. [What could best be described as **pebbles**] {were, *was} strewn across the lawn. ← **TFR**
(7) a. He was behaving exactly {**how**, ***what**} his sister was. ← **FR**
b. He was behaving [*what* I could only describe [$_{ZP}$ t as **strangely**]] (= (3c)). ← **TFR**

(6a) shows that *what* in an FR, even when semantically plural, is syntactically singular, and coerces, via the FR, singular agreement in the matrix verb. In contrast, (6b), construed as a TFR, licenses plural agreement in the matrix verb in virtue of the plural status of the small-clause non-subject. (7a) shows that *what* is incompatible with manner-adverbial status for the FR. In contrast, (7b) shows that manner-adverbial status of ZP's non-subject suffices to license such status of the TFR.

An interesting additional illustration of the matching effect in syntactic category in TFRs is provided by the pair in (8), which also reveals an additional distinction between the two constructions.

(8) a. #He invited [*what* seems [$_{ZP}$ t to be **intelligent**]] (e.g., Mary). ← **FR**
b. He invited [*what* seems [$_{ZP}$ t to be {**an intelligent girl, Mary**}]]. ← **TFR**

In (8a), the bracketed expression is the direct object of the matrix verb *invite*, and needs to be nominal. Since the non-subject of ZP is adjectival, it fails to match the containing bracketed expression in syntactic category, and can only be interpreted as an FR. The deviance of this example is attributable to a clash between inherent properties of *what* and the selectional properties of the matrix verb. Thus, while *what* is in general compatible with contexts that are neutral with respect to the +/-human distinction, as illustrated by the question-answer pair in (9a), it is incompatible with contexts that select humans, as illustrated in (9b). The deviance of (8a) shows that an FR in a context that selects humans may not be initiated by *what*. More precisely put, the FR in (8a) has the essential import of *the thing that seems to be intelligent*, and thus constitutes an insulting way of referring to a person.

In contrast, in the TFR in (8b), the human status of the non-subject of ZP (in conjunction with its nominal status) suffices to license the use of the TFR as object of *invite*.

(9) a. Q: What can you see? A: Mary, dressed in a funny costume.
Q: #What did you invite? A: #Mary.

Anticipating a point to be developed in detail in section 3.1, the reader is forewarned that the acceptability of (8b) does not justify the stronger assumption, made by Wilder (1998) and by van Riemsdijk in his numerous writings on the topic, that the non-subject of ZP and the TFR must be matched in +/-human status (see (25) and the preceding text thereon).

What has just been said makes it possible to support the earlier made claim that an English TFR can only be initiated by the **plain** form *what*, the free-choice form *whatever* being excluded. Thus, compare (8b) with (10).

(10) He invites [{whoever, #whatever} strikes him as an intelligent person].

In contrast to (8b), the version of (10) with *whatever* is insulting, just like (8a), which points to the conclusion that the bracketed constituent in (10) is necessarily an FR.

The facts brought to the attention of the Western linguistic world by McCawley's succint summary of Kajita's work triggered a considerable amount of interest in TFRs, a partial list of pertinent studies being, in addition to Wilder (1998) (which has already been mentioned), van Riemsdijk (1998, 2000, 2001, 2006a, b, 2012), Grosu (2003, Part II, 2010, 2014), Schelfhout, Coppen & Oostdijk (2004), Den Dikken (2005), van de Velde (2011) and Smet & van de Velde (2013).

An interesting feature of the works just cited (with the exception of Grosu 2003) is that much as in Nakau (1971) and Kajita (1977), the proposed analyses reacted primarily to facts like (6)-(8), and paid only cursory attention to facts like (3a, a'), (4) and (5), and more generally, to the semantics of TFRs and to the semantic distinctions between FRs and TFRs. The analyses at issue, while differing non-trivially in their details, shared the following overarching assumption:

(11) In a TFR, the non-subject of ZP is (also) present in the relative CP's matrix in syntactic and phonological representation, and thus in the input to semantics.

Informally put, these various works, with the lone exception of Grosu's studies mentioned above, viewed the non-subject of ZP as a sort of 'external head' of the TFR.

To facilitate the ensuing discussion, let us introduce some terminology. Let the non-subject of a TFR's ZP will be called 'the pivot', and approaches that assume (11), 'pivot-as-head' approaches. The approach advocated in Grosu (2003, 2014), to be described and explored below, will be called a 'pivot-in-situ' approach.

Of the various pivot-as-head approaches proposed in past literature, the one with the greatest empirical coverage is that developed by van Riemsdijk in the references cited above. Noting that the pivot is impressionistically string-medial in some TFRs, e.g., in English and German data like (12)-(13)

respectively, van Riemsdijk appealed to a mechanism he called 'Grafting', which enables two distinct trees to share a constituent that need not be the root of either tree, thereby giving rise to multi-dimensional representations. The structure he envisaged for TFRs is schematically shown in (14a), where the top and the bottom line stand for distinct bi-dimensional trees, which share the pivot and nothing else; for FRs, he proposed the multi-dimensional representation in (14b), which contrasts with (14a) in that the shared structure is the wh-phrase.

[12] [What might well look like **a meteorite** to a naïve observer] has just landed on my lawn.
[13] Ich werde mir kaufen, [was du als **einen passenden Wagen**
I will me buy what you as a suitable car
bezeichnen würdest].
characterize would
'I will buy myself what you would describe as a suitable car.'
(14) a. [$_{\text{Matrix Clause}}$ …… **YP$_k$** …….]
[$_{CP}$ what$_i$ … [$_{ZP}$ what$_i$ (BE) **YP$_k$** ...]…]
b. [$_{\text{Matrix Clause}}$ …… what$_i$ …….]
[$_{CP}$ what$_i$ … what$_i$ …]

Insofar as the semantics of TFRs is concerned, proponents of the pivot-as-head approach seem to have subscribed to a view expressed by McCawley (p. 757), and which can be reformulated as follows: the TFR minus the pivot is interpreted as a 'hedging' modifier of the pivot. This view was subsequently adopted by Wilder and van Riemdsijk in the references cited above, who offered, for data like the (a) sub-cases of (15)-(16), paraphrases with parentheticals having hedging force, as in the corresponding (b) sub-cases.

(15) a. Bill is speaking with what seems to be a policeman.
b. Bill is speaking with a policeman, or so it seems.
(16) a. He is eating what they referred to as a gigantic steak.
b. He is eating a gigantic steak, at least, this is how they referred to it.

Schelfhout, Coppen & Oostdijk (2004) in fact took one step further, and proposed a formal parenthetical analysis for TFRs, stating (contrary to fact, as far as I can tell) that the remainder of the TFR (in cases where the presumed head is TFR-final) is naturally pronounced with flanking pauses. – To the best of my knowledge, none of these writers offered an explicit compositional semantic analysis for TFRs.

In contrast to these writers, Grosu (2003, and later works) pursued the hypothesis that TFRs are indistinct from FRs insofar as gross configurational properties are concerned, the difference between them lying elsewhere. In

particular, he proposed to assume the structure in (17) for TFRs and for homophonous FRs.

(17) $[_{DP} \varnothing_{D}] [_{CP}$ what$_i$ … $[_{ZP}$ t$_i$ (BE) **YP** ...]…]

Grosu's primary motivation was to maintain the simplest possible structural assumptions for TFRs, making use of structures and principles that are independently needed for FRs. He also took certain steps (in his section 6) towards developing a compositional semantics for TFRs, which, however, was incomplete and, as I will argue below, inadequate in certain respects.

This article will pursue the following interrelated goals:

[i] To provide a sharper characterization of how TFRs differ from comparably structured FRs than has so far been proposed in past literature.
[ii] To provide a detailed compositional semantics for TFRs, in particular, one that goes substantially beyond Grosu (2003, section 6) in breadth, depth and adequacy.
[iii] To carry out as comprehensive a comparison as possible between pivot-as-head and pivot-in-situ approaches, focusing on the abilities of the two approaches to account for the syntactic, morphological, semantic and pragmatic properties of TFRs, as well as for the distinctions between TFRs and comparably structured FRs.

3. Preliminary comparison of the two types of approach

3.1 Pivot-as-head approaches

Pivot-as-head approaches are well equipped for dealing with data like (3c) and (6b), which exhibit matching in syntactic number and category between TFRs and their pivots. Since heads typically agree in these respects with the constructions they head, it is easy to see why the head-like behaviour of pivots has led to the hypothesis that a pivot must be the actual head of its TFR. However, this step turns out to have a number of problematic syntactic and morphological consequences, and also to give rise to structures that are not obviously suitable for a smooth compositional semantic intepretation.

A problematic syntactic consequence is that when the pivot occurs within a syntactic island, extraction out of it is degraded, as observed by Grosu (2003, section 5.5). Thus, extraction out of the non-subject of an *as* small-clause is in general degraded, as illustrated in (18a), and extraction out of a comparable constituent that functions as the pivot of a TFR is also degraded, as shown in (18b). Under the assumption that the pivot of a TFR is CP-external and that extraction can operate out of it, we would expect (18b) to

be as acceptable as, e.g., (18c), where the italicized material is incontrovertibly external to the relative CP.

[18] a. *Who$_k$ did you describe [$_{ZP}$ this picture as *a successful caricature of* t_k]?
b. *Who$_k$ did she draw what one might describe [$_{ZP}$ as *a successful caricature of* t_k]?
c. Who$_k$ did she buy *a successful caricature of* t_k that was painted by Mary?

This expectation is, however, not fulfilled: for extraction purposes, the pivot behaves as if it is strictly internal to CP, and this fact is 'surprising' for a pivot-as-head approach.

A morphologically problematic consequence is that the pivot of a TFR does not exhibit the kind of 'Case-matching effects' that are typically associated with the wh-phrases of FRs. This point was demonstrated in Grosu (2014, section 3), building on observations made in Grosu (2003, section 5.4). To summarize the gist of this demonstration, the FRs of Standard German, like those of many other languages, are sensitive to a Case obliqueness hierarchy, in particular, to the one shown in (19), whose effects differ cross-idiolectally in the following way: all speakers of German accept FRs whose wh-phrase bears a morphological Case that matches matrix requirements, some speakers accept FRs with a wh-phrase that bears a morphological Case more oblique than the one required by the matrix, and very few, if any, accept FRs with a wh-phrase that bears a Case less oblique than the one required by the matrix. The last type of situation is illustrated in (20).

[19] *Obliqueness Hierarchy*
Nom < Acc < Dat, where $\alpha < \beta$ means 'β is more oblique than α'

[20] *Er tötet, [*wer* ihm (-- dem Mafiaboss --)
He kills who.NOM him.DAT (the-DAT mafia boss)
über den Weg läuft]$_{ACC}$.
across the way runs
'He kills who(ever) crosses his way (he being the mafia boss).'

Now, consider (21a-b), with the bracketed structures interpreted as TFRs.

(21) a. Er hat sich gekauft [was du als
he has Refl bought what.ACC you as
einen passenden Wagen bezeichnen würdest]$_{ACC}$.
a.ACC suitable.ACC car characterize would
'He bought himself what you would characterize as a suitable car.'
b. Er hat sich gekauft [was als **ein**
he has Refl bought what.NOM as a.NOM

passender **Wagen** bezeichnet werden kann]$_{ACC}$.
suitable.NOM car characterized be can
'He bought himself what may be characterized as a suitable car.'

Pivot-as-head approaches predict comparable effects in relation to the morphological Case of the pivot. In particular, they predict that (21a) should be acceptable to everyone, and (21b), which replicates the situation illustrated in (20), should be acceptable to essentially no one. The situation reported by Grosu (2014) is, however, the following: Of over eighty native consultants speaking a variety of dialects, all except two could detect no difference between (21a) and (21b). The remaining two consultants (Henk van Riemsdijk and Josef Bayer) judged (21b) to be subtly degraded relative to (21a), but they also reported the same degree of degradation for (22b) relative to (22a), while reporting no degradation in externally-headed data minimally different from (21), which may be obtained from (21) by inserting *etwas* 'something' immediately before *kaufen*.

(22) a. Ich bin bereit zu kaufen [was immer du als **einen**
I am ready to buy what-ever you as a.ACC
passenden **Wagen** bezeichnen würdest]$_{ACC}$.
suitable.ACC car characterize would
'I am ready to buy whatever you would consider a suitable car.'

b. Ich bin bereit zu kaufen [was immer als **ein**
I am ready to buy what-ever as a.NOM
passender **Wagen** bezeichnet werden kann]$_{ACC}$.
suitable.NOM car characterized be can
'I am ready to buy whatever can be characterized as a suitable car.

Since the data in (22) are incontrovertible FRs (see (10) and remarks thereon in the surrounding text), this effect, whatever its ultimate explanation, is found in both TFRs and FRs, and is not found in incontrovertible externally-headed relatives. Since pivot-as-head approaches view the italicized phrases in (21), but not those in (22), as external heads, the fact that these phrases give rise to the same effects in both (21) and (22) is entirely unexpected. Thus, the (apparently minority) idiolects at issue provide no support whatsoever for the predictions of pivot-as-head approaches. Rather, all the judgments reported in Grosu (2014) with respect to (21)-(22) point to the conclusion that the morphological Case properties of the pivots of German TFRs do not conform to the predictions of pivot-as-head approaches.

Concerning the semantic consequences of pivot-as-head approaches, we will begin by considering how effectively it can deal with the double-guise status of TFRs. As noted in section 1, proponents of such approaches have suggested that a TFR minus its pivot has the import of a *hedging* modifier of the pivot, and have offered rough paraphrases in which the pivot occurs in the position of the TFR, while the import of the presumed modifier is con-

veyed by a parenthetical expression (see (15)-(16) and the text surrounding these examples).

As far as paraphrases of this kind are concerned, they do not correctly capture the truth conditions of the constructions they purport to paraphrase. To see this, consider (15a), reproduced below for convenience.

(15) a. Bill is speaking with what seems to be a policeman.
b. Bill is speaking with a policeman, or so it seems.

The entity that Bill is speaking with is presented under two guises: as a policeman in the worlds of what seems to be the case, and as an uncharacterized entity in the world that the speaker views as real; thus, while the speaker may be among those to whom it seems that the entity in question is a policeman, *(s)he at no point commits himself/herself to this view*. In the paraphrase in (15b), however, the speaker starts by committing himself/herself to the policeman status of the entity in question, and then hedges by going back on this commitment. Thus, (15a) and (15b) are not completely equivalent. This point can be appreciated more clearly in relation to (23a-b).

(23) a. Bill is speaking with what he thinks is a werewolf.
b. Bill is speaking with a werewolf, at least, he thinks so.

A speaker who does not believe in the existence of werewolves cannot truthfully assert (23), but can assert (23a).

The problem created by such paraphrases is exposed most dramatically in situations where the pivot defines neither of the two relevant guises, as, for example, in (24).

(24) a. Bill is speaking with what can't possibly be a policeman.
b. #Bill is speaking with a policeman, but it can't possibly be one.

In (24a), the entity that Bill is speaking with is presented as an uncharacterized entity in the world the speaker views as real, and as something other than a policeman in the worlds that (s)he views as possible ones. Thus, there is no policeman guise associated with this example. However, (24b) begins by presenting the entity at issue in the guise of a policeman, and then self-contradictorily asserts that this guise does not exist in any possible world.

Having shown that the hedging parenthetical approach does not shed light on the semantics of TFRs, a reasonable next step is to ask what, if any, semantic role is played by the pivot in the interpretation of the matrix. It turns out that the answer is 'none.' As we shall see, none of the semantic properties of the pivot are **necessarily** properties of the TFR.

Data like (15a) led Wilder and van Riemsdijk in their studies of TFRs to the view that a human status of the pivot coerces a comparable status for the

TFR, but this impression is incorrect, as brought out by the non-contradictory status of (25).

(25) Bill is speaking with what he thinks is a policeman, but it is in fact a bear skilfully dressed in a police uniform.

In general, no aspect of the content of the nominal predicate within the pivot is necessarily a property of the guise denoted by the TFR.

Furthermore, the determinational or quantificational properties of the pivot are not necessary properties of the TFR as a whole, either. To see this, consider the non-contradictory status of the (a) subcases in the following examples, in contrast to the contradictory status of the corresponding (b) subcases:

(26) a. Mary is addressing what she thinks are all our parliamentarians, but she is in fact addressing only {half of them, a bunch of monkeys}.
b. #Mary is addressing all our parliamentarians, but she is in fact addressing only {half of them, a bunch of monkeys}.

(27) a. Mary is addressing what she thinks are most parliamentarians, but she is in fact addressing only a small minority of them.
b. #Mary is addressing most parliamentarians, but she is in fact addressing only a small minority of them.

(28) a. Mary is yelling at what she thinks is the dog you bought yesterday, but it is in fact an entirely different dog.
b. #Mary is yelling at the dog you bought yesterday, but it is in fact an entirely different dog.

In fact, as already noted in connection with (3a), TFRs are typically construed as having existential force, in view of the lack of presuppositions concerning the identity or nature of the guise they denote. Appropriate paraphrases of the (a) subcases of (15), (23) and (24) are indicated in (29a-c) respectively.

(29) a. Bill is speaking with some entity that seems to be a policeman.
b. Bill is speaking with some entity that he thinks is a werewolf.
c. Bill is speaking with some entity that can't possibly be a policeman.

That TFRs may have existential force **independently** of the quantificational or determinational force of their pivot is also brought out in (30), where it can be seen that TFRs may felicitously occur in the existential context *there BE __ XP* even in situations where their pivot cannot.

(30) a.#There is now in the garden *Mary Smith*.
b. There is now in the garden [what John apparently thinks is *Mary Smith*], but it is in fact the neighbor's Doberman Pincher.

One reviewer observes that if TFRs can have existential force, they are predicted to exhibit scope ambiguities relative to universal quantifiers, and asks whether this prediction is fulfilled. I believe that (31) confirms this prediction, since the bracketed expression can describe either a potentially different girl for every boy, or some unique girl that every boy invited.

(31) At the last dancing party, every boy invited [what Bill thought was a pretty girl].

Summarizing the results of this section, while the view that the pivot is an element of the matrix can deal successfully with certain facts, it faces syntactic and morphological problems, and places the pivot in a position where it can make no useful contribution to the construction of the meaning of the TFR.

3.2 Pivot-in-situ approaches

A pivot-in-situ approach views TFRs as having the same gross configurational properties as FRs introduced by *what*, and thus assumes that the pivot is internal to the relative CP at all levels of representation. Concerning the phrase at the overt left periphery of an FR, in particular, *what*, the earlier literature contains a number of proposals, some placing *what* in CP-external head position (e.g., Bresnan & Grimshaw 1978, Larson 1987, 1998, McCawley 1998, p. 757), others placing it in [Spec, CP] and assuming a null category as external head (e.g., Groos & van Riemsdijk 1981, Harbert 1983, Suñer 1984, Grosu (2003), others placing it in [Spec, CP] and assuming no CP-external material (Šimik 2010), and others viewing *what* as both internal and external to CP (e.g., van Riemsdijk 1998, who proposes the structure in (14b)). In this paper, I will assume for concreteness the second of the four kinds of analysis just mentioned, in particular, (17), which I also view as optimal, for reasons pointed out in Grosu (2003, sections 2.1, 2.2, 2.3). I reproduce below the argument from section 2.1, which relies on (32) (= Grosu's (9)) (this example was an adaptation of one provided by Jacobson 1995).

(32) a. I will fire *whoever's signature* appears on this list.
b. #I will fire *anybody's signature* that appears on this list.

Note that if the italicized phrase in (32a) is assumed to be CP-external, as the one in (32b) incontrovertibly is, one would expect (32a) to necessarily have the pragmatically odd reading that (32b) has (i.e., that it is the signature, not its author, that gets fired), and this expectation is not fulfilled.

I now proceed to the evaluation of the ability of an approach based on the structure in (17) to deal with the facts brought up in section 2.1.

As far as the facts in (18) and (20)-(22) are concerned, there is no problem I can see. Since the pivot is internal to an island in (18b), the deviance of this example is expected, and since the pivot in (21) is not in a local relationship with the matrix, there is no reason to expect the kind of effects found in data like (20). As for the (apparently) minority idiolects that find the (b) subcases in (21)-(22) equally degraded relative to the (a) subcases, this is exactly what one may expect under the view that FRs and TFRs have the same configurational structure, and that this structure differs from that of overtly externally-headed relatives.

How can the pivot-in-situ approach deal with the double-guise content of TFRs? A preliminary observation is that regardless of the approach adopted, two potentially distinct guises of something can arise just in case the set of contextually accessible 'indices', i.e., worlds, times, locations, etc., is partitioned into subsets, each subset allowing a potentially distinct guise to be defined. This kind of partition is most naturally triggered by an explicit **intensional operator** within the relative, which may be, e.g., modal, temporal, or local, as in (33)-(35), where the operators are boldfaced.

(33) Bill is speaking with what he **thinks** is a werewolf (= (23a)).
(34) Manfred lives in what is **today** the capital of Germany
(but failed to have this status between 1945-1989, i.e., Berlin).
(35) Bill is swimming in what is a tiny spring **in the Black Forest**
(and a mighty river when entering the Black Sea, i.e., the Danube).

In (33), the partition is between the worlds of Bill's thoughts and those of the speaker's beliefs; in (34), it is between a period of time that includes the time of speech and an earlier time period; in (35), it is between the Black Forest and spatial points situated to the East of it.

While explicit intensional operators arguably make TFRs most immediately felicitous (*ceteris paribus*), such operators may also be implicit, at least for some speakers. Thus, if we suppress the boldfaced operator in (34), getting the reduced version of (36a), the result is still basically acceptable if *today* can be mentally inserted, making this version semantically indistinguishable from the full version with *today*. The reduced version of (36a) can also be felicitous if it is said to a child who does not know what the capital of Germany is, in which case it has the import of the other full version; in such a case, the partition is between worlds that reflect the knowledge of adults and worlds that reflect the knowledge of children. Another illustration of the possibility of implicit operators is the reduced version of (36), which may have the import of the full version if uttered by someone who initially thought Hamlet was speaking with a bunch of fog, and subsequently realized that Hamlet was in fact speaking with (the ghost of) his father.

(36) a. Manfred lives in what is ({**today, as any adult knows,**})
the capital of Germany.

b. Hamlet is speaking with what (**I now realize**) is his father.

Given a partition of indices of the kind illustrated in (33)-(36), the structure in (17) – reproduced below for convenience – is well suited for allowing distinct guises to be defined at distinct cells of the partition.

(17) $[_{DP} \varnothing_{D}] [_{CP}$ what$_i$ … $[_{ZP}$ t$_i$ (BE) **YP** ...]…]

Thus, the chain formed by *what$_i$ … t$_i$* has its foot in the scope of the relative-internal intensional operator, and its head is outside the operator's scope. It is thus in principle possible for t$_i$ to denote, at one cell of the partition, one guise, which is assigned a characterization by YP (via predication or equation, and in cases like (24a), in combination with negation), and for DP to denote, at the other cell of the partition, a potentially distinct guise that is left uncharacterized within the DP. *What$_i$* may be assumed to serve as a trigger for abstraction (much as in FRs), according to the standard view that movement triggers lambda abstraction in the sister of the fronted constituent (see Heim & Kratzer 1998; see also Caponigro 2003, 2004).

It remains to consider how (17) can serve as basis for an account of the properties of TFRs that distinguish them from FRs, in particular, syntactic matching facts like those in (6)-(8), compatibility with a human denotation, as in (8b) and (25), and the indefinite construal of the complex DP (see (29) and the preceding remarks thereon). In other words, it needs to be specified what distinguishes situations where (17) underlies an FR from situations where it underlies a TFR.

Jacobson (1988, 1995) proposed out that (English) FRs are inherently definite, as brought out by the fact that (37a) is naturally paraphrased by (37b), not by (37c).

(37) a. I cooked [what Bill brought from the market].
b. I cooked (all) the things that Bill brought from the market.
c. I cooked some (of the) things that Bill brought from the market.

This seems to be the standard view on FRs, espoused and defended by the overwhelming majority of researchers, both with respect to FRs with 'plain' wh-items (see Hinterwimmer 2013) and with respect to FRs with wh-ever items (see, e.g., Dayal 1997, von Fintel 2000, Tredinnick 2005, Condoravdi 2008, and Lauer (2009).

One reviewer asks whether it is possible to derive this restriction from independent properties of FRs. To the best of my knowledge, no one has so far suggested a plausible explanation for this state of affairs. Jacobson stipulates definiteness as a property of the nominal expression that includes the relative CP, and Grosu & Landman (1998, 2016) stipulate that FRs, as well as a number of additional constructions with comparable 'indefiniteness' effects (Hindi-type correlatives, Japanese-type internally headed relatives,

'amount' externally-headed relatives of the kind found in English), involve a CP-internal process of 'maximalization', which maps the abstract denoted by CP to the singleton that contains its maximal member (if there is one, maximalization being undefined otherwise. These writers further argue that existential quantification of the complex DP is infelicitous to the extent that it fails to preserve the effects of maximalization within CP, thereby rendering the maximality operation vacuous, presumably, an undesirable state of affairs. To the best of my knowledge, there is at the moment no fully convincing genuinely explanatory account of the maximality effects in any of these constructions[1]. Thus, whether an explanatory account exists or not must remain, as far as I can tell, an open issue at the moment.

In the analyses of FRs proposed in Jacobson (1988, 1995) and Grosu and Landman (1998), a definiteness operator is applied to the set denoted by CP. In section 2 of this paper, it was argued that TFRs are naturally paraphraseable only by indefinite expressions. Does this imply that a comparable definiteness operator may not be applied to the set denoted by CP in TFRs? The answer to this question is postponed until section 5, where the formal analysis of TFRs is addressed and discussed.

What of the syntactic matching effects and compatibility with human status, as in (6)-(8)? Grosu (2003, section 7.4) proposes that *what*, which possesses certain inherent specifications in FRs (and elsewhere, e.g., in interrogatives), is voided in TFRs of categorial and syntactic number specifications, as well as of its incompatibility with a specifically human denotation. If anything is retained, it is whatever specification enables *what* to trigger abstraction in its sister constituent when it is in [Spec, CP] in the input to semantics. The effects at issue are accounted for by assuming that the categorial and syntactic number specifications of the pivot are necessarily transferred to the underspecified t_i in (17), whereby they become properties of the entire chain headed by $what_i$, and ultimately of the containing complex DP, the null D having no potentially conflicting inherent specifications (in English; see (39)-(40) and remarks thereon in the surrounding text). As for the human content of the pivot, it does not automatically become a property of the complex DP, as shown by the non-contradictory status of (25), but the under-specification of $what_i$ and D makes DP compatible with a human denotation, as brought out by the fact that (25) (repeated below for convenience) is felicitous both as it is, and with the post-comma sequence replaced by *but it was in fact a spy wearing a stolen police uniform*.

(25) Bill is speaking with what he thinks is a policeman, but it is in fact a bear skilfully dressed in a police uniform.

[1] Simik (2010) attempts to relate the definiteness of FRs to their obligatory finiteness, but his proposal also rests on a stipulation, and moreover seems to make the incorrect prediction that all finite property-denoting CPs exhibit maximality effects.

The assumption that *what* may be under-specified and acquire certain specifications from the non-subject of ZP gains additional credibility from the observation, prominently noted in earlier literature (e.g., Carlson 1991, Heller and Wolter 2007), that effects strikingly similar to those in (8) are also found in English copular sentences whose subject is a demonstrative pronoun, as can be seen in (38).

(38) a. #This/that is {tall, pretty}.
b. #This/that plays the piano nicely.
c. This/that is {Rosa, an intelligent woman}.

Thus, while *this/that* are in general insulting when they purport to denote a person, as in (38a,b), they are impeccable with this import when used as the subject of a copular sentence whose non-subject is a nominal expression, as in (38c). This suggests that these demonstratives may be underspecified for categorial and +/-human content, and that a felicitous result emerges just in case they can receive appropriate specifications from their predicate; under-specification yields inappropriate results in cases like (38a,b), because adjectival and verbal phrases may not denote human individuals.

One additional set of facts that lends further credibility to the approach to (6)-(8) outlined two paragraphs above, and arguably to the assumption that TFRs have the structure in (17) (which crucially assumes that FRs and TFRs are headed by D), is found in a number of Romance languages, e.g., French and Italian, where the counterparts of *what*-FRs and TFRs are 'light-headed' DPs, whose CP typically exhibits a complementizer, and whose light head is a demonstrative pronoun, *ce* in French and *ciò* in Italian. In contrast to (8b), comparable constructions in French and Italian (illustrated in (39) and (40) respectively) are infelicitous, having the essential insulting status of (8a).

(39) #Jean a invité [ce qui semble être {**Marie, une jolie fille**}].
Jean has invited Dem Czer seems be Marie a pretty girl
Intended: 'Jean has invited what seems to be {Marie, a pretty girl}.'
(40) #Ho invitato [ciò che sembrava essere {**Maria, una bella ragazza**}].
have.1.Sg invited Dem Czer seemed be Maria a pretty girl
Intended: 'I invited what seemed to be {Maria, a pretty girl}.'

This last effect has not, to the best of my knowledge, been pointed out or discussed in earlier literature. Within the pivot-in-situ approach based on (17), the demonstrative pronoun would occupy the position of D, with a null syntactic operator substituted for *what*, and the infelicity of (39)-(40) can be handled by assuming that the TFRs of these languages, while functioning in many ways like their English counterparts (see, e.g., (95)-(96) in Grosu 2003), are headed by a demonstrative pronoun that cannot lose its inherent incompatibility with a necessarily human specification; this assumption is

consonant with the observation that in French, the counterpart of (38c) is perceived as insulting, as shown in (41).

(41) #Ceci/cela est {Marie, une femme intelligente}.
this/that is Marie a woman intelligent
'This/that is {Marie, an intelligent woman}.

The facts in (39)-(40) point to the conclusion that TFRs are only as 'transparent' as their left periphery is, and this is just what one may expect under the view that the left periphery includes the head of the TFR.

3.3 A remaining issue

There is a particular fact that I have not yet discussed, and which proponents of a pivot-as-head approach (in particular, den Dikken 2005 and van Riemsdijk 2006a) have viewed as providing strong support for their approach. The fact in question concerns the Dutch counterpart of English data like the reduced version of (42).

(42) He made a [?*(new and) [what I would describe as **fascinating**]]
proposal.

A reviewer, who indicates that (s)he is a native speaker of English, found data like the reduced version of (42) degraded, and native speakers of other languages have reported comparable judgments in personal communications. However, data like the full version of (42) are generally felt to be substantially improved or entirely OK, and in view of this, I will consider data like the reduced version of (42) grammatical, even if stylistically awkward.

A Dutch counterpart of the reduced version of (42) (adapted from van Riemsdijk 2006a) is shown in (43).

(43) Bill ontdekte [een wat$_k$ ik zou noemen t$_k$ **eenvoudig**-e] oplossing.
Bill discovered a what I would call simple-Agr solution
'Bill discovered a what I would call simple solution."

This example is potentially interesting for two reasons. First, if the string *t$_k$ eenvoudig-e* corresponds to the small clause selected by the verb *noemen* 'call' (as it does if the structure of the TFR is as in (17)), its linear position relative to the selecting verb is unexpected, since it is disallowed in other constructions, as illustrated in (44).

(44) a. Jan vraagt zich af wie$_k$ Marie [t$_k$ eenvoudig] noemt.
Jan asks self off who Marie simple calls
'Jan wonders who Marie calls simple.'
b.* Jan vraagt zich af wie$_k$ Marie noemt [t$_k$ eenvoudig].

Second, if *eenvoudig-e* is the small clause's predicate, the fact that it bears an agreement suffix is unexpected, since a general fact about Dutch (and German) is that adjectives are uninflected in predicate position and inflected in pre-nominal modifier position.

The pivot-as-head approach has a straightforward account of (43). As van Riemsdijk (2006a) notes, it suffices to assume that YP_k in (14) is just the adjectival stem *eenvoudig*, that the overt token of *eenvoudig* is the one in the matrix, and that this overt token modifies *oplossing*. Under these circumstances, the agreement suffix is expected.

The pivot-in-situ approach can deal with the presence of the agreement marker on the adjective by assuming that the transparent 'channel of transmission' created by the under-specification of *wat* is exploited in the converse direction, so that the phi-properties of *oplossing*, which are transmitted to the modifying adjectival TFR, can ultimately reach the adjectival pivot. Concerning the exceptional word order in (42), the approach under consideration can appeal to the fact that this order is necessary for the satisfaction of the so called Head Final Filter (Williams 1982), which is operative in Dutch (and in a number of additional languages) and which essentially requires that a pre-nominal AP end with its A head, but which can also be satisfied by an AP-final adjective that is not the AP's head (see Grosu 2003, section 7.5, for detailed discussion and illustration of this additional point). The filter is respected in (42) and (43), where the boldfaced adjectives are TFR-final, and is violated in data like *this is [a what I might call **hard** to understand] issue*, where the boldfaced adjective fails to be TFR-final. To account for the fact that (43) is acceptable, despite the violation of the word-order requirement illustrated in (44), it is necessary to stipulate that the Head Final Filter is, in Dutch, a 'stronger' requirement than the word-order principle at issue, and thus that the need to satisfy the former licenses a violation of the latter.

What has just been said seems to put the pivot-in-situ approach at a disadvantage relative to the pivot-as-head approach in relation to data like (43). However, if we extend the range of relevant data to include comparable data from German, this impression disappears. German also needs to satisfy the Head Final Filter and certain word order requirements, but the counterpart of (43), which satisfies the former, but not the latter, is deviant, as shown in (45a), and so is the variant in (45b), which satisfies the latter, but not the former.

(45) a. *Bill entdeckte eine [was ich {nennen wuerde, wuerde nennen}
Bill discovered a what I call would would call
einfach-e] Lösung.
simple-Agr solution
b. *Bill entdeckte eine [was ich **einfach**-e {nennen wuerde,
Bill discovered a what I simple-Agr call would

wuerde nennen} Lösung.
would call solution
Intended: 'Bill discovered a what I would call simple solution.'

If we now consider how the two approaches can deal with the combined facts in (43) and (45), the situation looks as follows: The pivot-as-head approach has an over-generation problem in that the expectedly grammatical (45a) is in fact ungrammatical; it thus needs to stipulate the deviance of this example. The pivot-in-situ approach has an under-generation problem in that the grammaticality of (43) is unexpected. As noted above, it needs to stipulate that the Head Final Filter can, in this particular case, overcome word order requirements in Dutch, while in German, neither principle can overcome the other. It thus seems that neither approach has a decisive advantage over the other insofar as these language-specific facts are concerned, and I consequently feel free to put these facts aside when evaluating the relative (de)merits of the two approaches in section 5.

4 The semantics of *what*-FRs

We have so far discussed *what*-FRs and TFRs in an essentially informal way. In this section and the next, we take a more precise look at their semantics and at the analytical differences between them. In these two sections, I assume the structure in (17) for both TFRs and comparably structured FRs, reserving for section 6 a consideration of their semantics under the assumption that they have the structures in (14).

Concerning *what*-FRs, I assume that they are definite (in keeping with what was said in section 3.2), and that they are free from the double-guise felicity condition that characterizes TFRs. We begin by addressing (46a), which is an incontrovertible FR (since it does not conform to the schema in (17)), and which includes no intensional operator (overt or covert), the only contextually accessible world being the one of evaluation.

(46) a. At the last dinner, John ate [what Mary had cooked –].
b. Ate (j, σ(λx. cooked (m, x)))

For concreteness, assume the following context: Exactly four dishes were served, call them a, b, c, d, and Mary cooked only a, b, but not c, d. In this context, (46a) says that that Johny ate the sum of dishes a⊔b. Analytically, I propose to follow Grosu & Landman (1998), who assumed an inherent [MAX] feature on C that triggers the maximalization operation described in section 3.2 (which, recall, maps the output of abstraction to the singleton that contains its maximal member if there is one, and is undefined otherwise). Since there is no partition of accessible worlds, I assume that the gap denotes an **extensional** variable, in particular, an entity variable (type e); I further assume that *what* coerces abstraction over that variable, and that the

external D, which, in view of maximality, needs to be construed as a definiteness operator, picks out the singleton's member as the denotation of the complex DP. The resulting translation of (46a) is shown in (46b).

To be sure, *what*-FRs are not incompatible with an internal intensional operator and with a resulting partition of worlds (or other indices), but so long as this does not induce the emergence of two potentially distinct guises associated with the construction, one of the guises being unspecified and free of presuppositions, an analysis that relies on an extensional variable continues to be adequate. Thus, consider (47), in a context where the facts are as before, except that John incorrectly thought that Mary had cooked c⊔d and that she hadn't cooked a⊔b.

(47) Bill ate [what *John thought* Mary had cooked --].

The natural reading of (47) in the above context is a *de re* reading, which may be represented as in (48a), where w, w' are variables over worlds, and w denotes the world of evaluation. Note that while John and the speaker hold different beliefs about who cooked the various dishes, they agree that Bill ate c⊔d. There are thus no two guises, one of them unspecified, for the denotation of the complex DP, its only denotation being as shown in (48b).

(48) a $EAT_w(bill, \sigma(\lambda x.\forall w' \in THINK_{w,john}: COOK_{w'}(mary,x))$
b. $\sigma(\lambda x.\forall w' \in THINK_{w,john}: COOK_{w'}(mary,x)) = c \sqcup d.$

What has just been said is also applicable to constructions with the structure in (17) when construed as FRs. Thus, consider (49a) (a variant of (5a)).

(49) a. Alex bumped into [what Bill thinks is {a dog, Fido}].
b. $BUMP\text{-}INTO_w(alex, \sigma(\lambda x.\forall w' \in THINK_{w,bill}:$
$\{[DOG_{w'}(x)], [x=f]\}))$
c. $\sigma(\lambda x.\forall w' \in THINK_{w,bill}:\{[DOG_{w'}(x)], [x=f]\})$ = the garden-gate

In addition to a TFR construal, which is appropriate if, e.g., Bill is temporarily blinded by the sun and gets the incorrect impression that Alex bumped into a dog (when he in fact bumped into, say, the garden-gate), (47a) is also construable as an FR in, e.g., the following context: Alex bumped into the garden gate, and Bill, who is insane, believes that the garden gate has the property of being a dog or is called Fido. Although Bill and the speaker have different views of what properties the garden-gate has, they agree that Alex bumped into the garden-gate, and (49c) holds.

5 The semantics of TFRs

In this section, I propose semantic analyses for a variety of kinds of TFRs, hoping that the range of constructions I will address is broad enough to enable the reader to see how other TFR constructions may be handled. I propose to pay special attention to the ways in which the double-guise property can be captured, and to the ways in which TFRs differ from *what*-FRs that conform to the schema in (17).

I adopt one general assumption, which departs from the proposals made in Grosu (2003, section 6), who assumed that the interpretation of ZP must always rely on equation: I impose no restrictions on the construal of ZP, allowing its interpretation to make use of either predication or equation, whichever is appropriate. More generally, I do not rule out in principle any of the construals assigned to simplex copular constructions and to small clauses in earlier literature, e.g., the four classes of copular sentences proposed in Higgins (1979), while also allowing for the possibility that some class(es) may fail to be realized in TFRs for independent reasons. For example, I do not quite see how Higgins' identity statements, such as *Cicero is Tully,* which involve two explicit referential expressions, could arise in TFRs, where one of the guises needs to be unspecified. Be this as it may, I do not propose to **stipulate** the exclusion of any interpretation of ZP.

5.1 TFRs with positively characterized (in)definite nominal pivots

Let us now reconsider (49a), repeated for convenience as (50a), focusing this time on its TFR construal, which is paraphraseable by (50b).

(50) a. Alex bumped into what *Bill thinks* is {a dog, Fido}.
b. Alex bumped into something that Bill thinks is {a dog, Fido}.

We now assume that Bill is a sane person, who merely happens to be temporarily blinded by the sun. In this situation, Bill does not assume that what Alex bumped into was **necessarily** a dog/Fido. But if we attempt to analyze this reading by means of an **extensional** variable and with no appeal to mechanisms that can circumvent the implications of this step (e.g., structured meanings, as in Cresswell & von Stechow 1982), we get (51), which is identical to (49b), and which assigns to Bill a belief he does not have, namely, that whatever it was Alex bumped into was a dog/Fido.

(51) $\text{BUMP-INTO}_{w}(\text{alex}, \sigma(\lambda x.\forall w' \in \text{THINK}_{w,\text{bill}}:$
$\{[\text{DOG}_{w'}(x)], [x=f]\}))$

The reason is that the variable x, being extensional, is inapplicable to the world variable w', and is thus assigned a constant value in all the contextually accessible worlds, which include all of Bill's belief worlds.

The earlier literature offers a plethora of studies that addressed substitutivity in opaque contexts, and which can serve as inspiration for dealing with a double-guise presentation of something; a highly incomplete list of relevant works is Cresswell and von Stechow (1982), Berg (1988), Aloni (2001), and Schwager (2009).

The approach I will adopt for data like (50a) relies on functions from worlds (or indices of other kinds) to something else, in particular, on individual concepts. However, if we use such functions, we need to restrict them in some way to ensure that they make available distinct guises of **the same thing**, as prominently pointed out by Hintikka (1972, 1975). To see that merely appealing to individual concepts is not sufficient, assume that we translate (50) by viewing t_k as denoting a variable over unrestricted individual concepts, as in (52), where $\mathbf{x}$ is a variable of type <s,e>, w is the world of evaluation, and *what*, just as in FRs, triggers abstraction over its sister. Note that in (52), I have used, without argument for the moment, the kind of definiteness operator that was assumed for FRs, except that in order to be applicable to a set of individual concepts, the operator needs to be of the type indicated in the subscript of its fuller representation $\sigma_{<<<s,e>,t>,<s,e>>}$. The (in)appropriateness of assuming a definiteness operator for TFRs will be explicitly addressed later in this section; for the time being, we focus on the inappropriateness of using unrestricted individual concepts.

(52) $\text{Bumped-into}_w(\text{alex}, \sigma(\lambda\mathbf{x} \wedge \forall w' \in \text{THINK}_{w,\text{bill}}: \{\text{DOG}_{w'}(\mathbf{x}(w')), \mathbf{x}(w')=f\})(w)$

Thus, since the values that an unrestricted individual concept may take at distinct indices need not be related in any way, (52) says that (50a) is true if Alex bumped into something and if something that was **not necessarily related to the bumping event** seemed to him to be Mary. Clearly, this is too weak, and a constraint needs to be imposed on the individual concepts over which the variable ranges, in particular, the constraint that their values at distinct indices should be construable, in context, as distinct guises of **the 'same' thing**. Lewis (1976, 1983) referred to such individual concepts as 'counterpart functions', and I will occasionally use this term in what follows, without however assuming Lewis' specific theory of counterparts *in toto* (in particular, I do not propose to assume that individuals exist in a single world, and that any trans-world identification involves counterparts). For this reason, I have used the non-technical and more generally applicable term 'guise'.

Be this as it may, in the case of (50a), the natural contextual property that makes it possible to view the garden-gate and a dog/Fido as contextual counterparts (and thus as distinct guises of the 'same thing') is the following: *being the object that is located in all the relevant worlds at the space - time region where Alex's body made a forceful physical contact.* This is, of

course, not the only natural contextual property that can give rise to counterparts, as will be seen in relation to examples examined in what follows, but it seems to be the appropriate one for this example.

There are at least two ways in which the counterpart restriction may be imposed on an individual concept variable. One way is to build the restriction into the definition of the variable. Thus, if we define the x variable in (52) as one ranging over individual concepts whose values at all the indices at which they are defined are contextually salient counterparts of each other, (52) becomes an adequate translation of (50a). An alternative way is to allow x to range over unrestricted individual concepts and to constrain it by using a contextual variable $\mathbf{C}_{<<s,e>,\,t>}$, whose type is indicated by its subscript. Under the latter implementation, (52) is replaced by (53).

(53) $\text{Bumped-into}_w(\text{alex}, \sigma(\lambda\mathbf{x}.\mathbf{C(x)} \wedge \forall w' \in \text{THINK}_{w,\text{bill}}: \{\text{DOG}_{w'}(\mathbf{x}(w')), \mathbf{x}(w')=f\})(w)$

In words: *Alex bumped into the value at w of the contextually selected individual concept whose value in Bill's think-worlds (at the moment of speech) is a dog/Fido.*

The latter notation makes it explicit that the notion of counterpart involved in the semantic analysis is not an absolute notion, but a highly context dependent one: the guises are linked in the context by a salient linking property (often, but not always, deictic, as in the example given here). In what follows, I will adopt the implementation in (53), while noting that what crucially matters for current purposes is that the counterpart restriction should be imposed in **some** way, whether as in (53), or by defining $\mathbf{x}$ in (52) as a variable over individual concepts restricted by the counterpart condition.

For completeness, I note that appeal to individual concepts for the purpose of capturing counterpart relations was made in at least one earlier study, Grosu & Krifka (2007). These writers addressed a construction they called "Equational Intensional 'Reconstruction' Relatives" (EIRs), which exhibits a number of similarities with TFRs, in particular, a CP-internal ZP that includes an explicit or implicit intensional operator, with the important distinction that the gap is in the scope of the intensional operator. This fact has the result that the denotatum of the complex DP is evaluated at the indices of this operator, thereby inducing certain compatibility requirements between these indices and those of the matrix, requirements that are entirely absent in TFRs (for abundant illustration of what has just been said, and for discussion of further non-trivial differences between EIRs and TFRs, the interested reader is referred to Grosu & Krifka's article).

I confine myself here to providing two illustrations of EIRs, which saliently bring out an important similarity with TFRs.

(54) a. [The gifted mathematician that [$_{ZP}$ Bill *supposedly* is –]]
ought to have solved this simple problem with greater ease.
b. [The happy couple that [$_{ZP}$ these two young people *seem* to be –]]
is in fact a genuine reality.

In (54a), the complex DP denotes a counterpart/guise of Bill in the worlds of what is generally supposed to be the case, which potentially differs from Bill's guise in the worlds of the speaker in being a gifted mathematician. In (54b), the complex DP denotes a counterpart/guise of 'these' two young people in the worlds of what seems to be the case, which potentially differs from their guise in the worlds of the speaker in being a happy couple. The similarity with TFRs is that the *potential* differences between the two guises need not be actual ones. The matrix VP in (54a) strongly implicates that the speaker does not view Bill as a gifted mathematician, while the one in (54b) asserts that the young people are in effect a happy couple. That a similar state of affairs exist in TFRs is brought out by the felicity of both continuations in (55).

(55) Mary is talking to [what *seems* to her to be a policeman], {but is in fact a bear wearing a policeman's uniform, and actually is one}.

We may now return to an issue I raised in section 3.2, and which was hinted at earlier in this section (see the lines before example (52)), namely, whether it is appropriate to use a definiteness operator for the formal analysis of TFRs. In addressing this issue, it is of the utmost importance to distinguish two orthogonal issues: (i) whether the set of individual concepts obtained by abstraction at the CP level may be formally analysed as bound by a definiteness operator, and (ii) the fact, already noted in section 2, that the **value** of the TFR at matrix indices has invariably indefinite force.

Recall that in section 2, I pointed out that (5a) (reproduced below for convenience) allows both an FR and TFR construal, these construals being most naturally paraphraseable by (5b) and (5c) respectively.

(5) a. Alex bumped into [*what* he thought was a dog].
b. Alex bumped into *that* which he thought was a dog.
c. Alex bumped into *something* that he thought was a dog.

Recall moreover that it was also noted in that section that while a unique entity may in principle be described by either a definite or an indefinite expression, the definite expression is preferred when its denotatum is part of the 'common ground' and/or possesses certain presupposed properties (in the worlds in which it is defined). At least the latter of these conditions for a definite interpretation is met on the FR construal of (5a), where the relative clause characterizes the denotatum of the complex DP, but neither is met on the TFR construal, where the relative clause characterizes only the CP-

internal guise, but not the guise denoted by the matrix value of the complex DP. This distinction was argued to be responsible for the two distinct paraphrases of (5a) shown in (5b-c).

Concerning (i), I see no need to assume that there is more than one individual concept whose unspecified matrix value is what Alex actually bumped into and whose value in the worlds of Bill's thoughts is a dog/Fido. If so, CP may be viewed as denoting a singleton. Note that on this view, it is not necessary to stipulate uniqueness by means of the [MAX] feature or in some other way (as is widely assumed to be necessary for FRs), since uniqueness constitutes a reasonable and plausible semantic assumption. Recall that the [MAX] feature within CP was argued in Grosu & Landman (1998) to exclude existential quantification of the complex DP on the grounds that such a step would make the maximalization operation vacuous, but if this feature is not necessarily present in TFRs, existential quantification cannot be excluded. What this means is that, along with the translation of (50a) shown in (53'a) (= (53)), we need to also allow the translation in (53'b). As far as I can see, the truth conditions assigned to (50a), and in particular the indefinite force of the TFR's value, are correctly captured under either translation. To bring this out, I offer 'enriched' translations in (53'c-d), where I explicitly express the indefiniteness of the TFR's value under either type of quantification applied to CP (in (53'), y a variable of type e). I draw special attention to (53'c), where the sigma applied to the set of individual concepts co-exists with an existential quantifier binding an individual variable that gets equated with the value of DP. In sum, whether the individual concept variable ends up 'bound' by a sigma or by an existential quantifier, the indefinite interpretation of the complex DP's **value**, that is to say, of that which functions as the internal argument of the matrix predicate *bump-into*, remains unaffected.

(53') a. $\text{Bumped-into}_w(\text{alex}, \sigma(\lambda\mathbf{x}.\mathbf{C(x)} \wedge \forall w' \in \text{THINK}_{w,\text{bill}}: \{\text{DOG}_{w'}(\mathbf{x}(w')), \mathbf{x}(w')=f\})(w)$

b. $\exists\mathbf{x}[\mathbf{C(x)} \wedge \text{Bumped-into}_w(\text{alex}, \mathbf{x}(w)) \wedge \forall w' \in \text{THINK}_{w,\text{bill}}: \{\text{DOG}_{w'}(\mathbf{x}(w')), \mathbf{x}(w')=f\}]$

c. $\exists y[\text{Bumped-into}_w(\text{alex}, y \wedge y = \sigma(\lambda\mathbf{x}.\mathbf{C(x)} \wedge \forall w' \in \text{THINK}_{w,\text{bill}}: \{\text{DOG}_{w'}(\mathbf{x}(w')), \mathbf{x}(w')=f\})(w)$

d. $\exists y[\exists\mathbf{x}[\mathbf{C(x)} \wedge \text{Bumped-into}_w(\text{alex}, y \wedge y = \mathbf{x}(w)) \wedge \forall w' \in \text{THINK}_{w,\text{bill}}: \{\text{DOG}_{w'}(\mathbf{x}(w')), \mathbf{x}(w')=f\}]]$

It seems appropriate to explicitly articulate at this point what I view as the minimally necessary assumptions concerning the semantic properties that distinguish the formal representation of TFRs from that of FRs in general and of homonymous FRs in particular. I submit that there are two such differences: TFRs, but not FRs, (i) necessarily rely on a function from indi-

ces, in particular, on abstraction over an **individual concept variable** (restricted by a contextual counterpart requirement) and (ii) necessarily include an (explicit or implicit) **intensional operator** within the relative clause. The conjunction of these two factors leads to the double-guise construal of TFRs, to the absence of an explicit characterization of the matrix guise within the TFR, and to the fact that this guise, which is denoted by the matrix value of the TFR, is understood as indefinite, as made explicit in the enriched representations in (53'c-d)[2].

I conclude this section by providing a detailed derivational analysis of an example comparable to (50a), in particular, (56a). I use in (56) a definite operator for the complex DP, but I also provide in (56') an alternative translation that appeals to existential quantification, since, as I noted, I view both of them as adequate for this particular example. I also view both types of analysis as adequate for the constructions discussed in section 5.2 – 5.4, but will confine myself to using a single type for illustration (in particular, the one that relies on existential quantification), the construction of the alternative being a straightforward matter. In section 5.5, I argue that for the constructions addressed in that section, the approach that relies on existential quantification is to be preferred to one that relies on definiteness.

Concerning the Raising(-to-Subject) construction in (56a), I assume, for concreteness, that Raising involves A-type re-merger, and that of the two tokens of t_k in this example, it is the lower one that gets interpreted. As before, **x** is a variable of type <s,e>, w, w', w'' are variables over worlds, w being the world of evaluation, Q is a variable of type <<s,e>t>, p is a variable of type <s,t>, and m is a constant of type e, because Mary is here interpreted in the same way in all the contextually relevant worlds, and I thus see no need to interpret it as an individual concept with a constant value in all contextually accessible worlds.

In analysing subsequent data, I will feel free to skip the steps that precede the translation of CP, hoping that the step-by-step compositional analysis in (56) gives a clear enough idea of how this works elsewhere.

(56) a. $[_{IP}$ Alex bumped into $[_{DP} \varnothing_D [_{CP}$what$_k$ [C t_k seemed to Bill t_k to be Mary]]]].

b. *Mary* → m, *Bill* → b with m,b ∈ CON_e

c. t_k → **x** with **x** ∈ $VAR_{<s,e>}$

d. *be* → λx.λy. y = x

e. *be Mary* → λy. y = m

For (56e) to be applicable to ***x****, the latter must shift down, as in (56f):*

---

[2] I do not think that this enrichment needs to be explicitly added to formal semantic representations, but I have no special objection to doing so. In what follows, I will omit the enrichment.

f. $\mathbf{x} \rightarrow \mathbf{x}(w')$ type e, with $w' \in VAR_s$

g. t_k *be Mary* $\rightarrow \mathbf{x}(w') = m$ type t

h. *seem* $\rightarrow \lambda y \lambda p. \forall w'' \in seem_{w,y}: p(w'')$, with $y \in VAR_e$, $p \in VAR_{<s,t>}$

i. *seem to Bill* $\rightarrow \lambda p. \forall w'' \in seem_{w,b}: p(w'')$

For (56i) to be applicable to (56g), the latter must shift up, as in (56j):

j. $\mathbf{x}(w') = m \rightarrow \lambda w'. \mathbf{x}(w') = m$ type <s,t>

k. *seem to Bill* t_k *to be Mary* $\rightarrow \forall w'' \in seem_{w,b}: [\lambda w'. \mathbf{x}(w') = m](w'')$
$= \forall w'' \in seem_{w,b}: \mathbf{x}(w'') = m$ of type t

The movement of what *triggers lambda abstraction in (56k), yielding (56l):*

l. $\lambda \mathbf{x}. \forall w'' \in seem_{w,b}: \mathbf{x}(w'') = m$ type <<<s,e>,t>, t>

m. *what* $\rightarrow \lambda Q. \lambda \mathbf{x}. C(\mathbf{x}) \wedge Q(\mathbf{x})$, type <<<s,e>,t>, <<s,e>,t>>, with $Q \in VAR_{<<s,e>,t>}$

n. CP $\rightarrow \lambda \mathbf{x}. \mathbf{C(x)} \wedge \forall w'' \in seem_{w,b}: \mathbf{x}(w'') = m$
of type <<s,e>,t>

o. DP $\rightarrow \sigma(\lambda \mathbf{x}. \mathbf{C(x)} \wedge \forall w'' \in seem_{w,b}: \mathbf{x}(w'') = m)$, of type <s,e>

p. $\sigma(\lambda \mathbf{x}. \mathbf{C(x)} \wedge \forall w'' \in seem_{w,b}: \mathbf{x}(w'') = m)(w)$:
the value in w of the concept in step o of type e

q. IP $\rightarrow$ Bumped-into$_w$(alex, $\sigma(\lambda \mathbf{x}. \mathbf{C(x)} \wedge \forall w'' \in seem_{w,b}: \mathbf{x}(w'') = m)(w)$) of type t

In words: *Alex bumped into the value at w of* ***the*** *contextually selected individual concept whose value in Bill's seem-worlds is Mary.*

(56') o'. DP $\rightarrow \lambda P \exists \mathbf{x}[\mathbf{C(x)} \wedge \forall w'' \in seem_{w,b}: \mathbf{x}(w'') = m \wedge P(x)]$,
of type <<<s,e>,t>,t>

q'. IP $\rightarrow \exists \mathbf{x}[\mathbf{C(x)} \wedge \forall w'' \in seem_{w,b}: \mathbf{x}(w'') = m \wedge$ bumped-into$_w$(alex, $\mathbf{x}(w)$)] of type t

In words: *Alex bumped into the value at w of* ***a*** *contextually selected individual concept whose value in Bill's seem-worlds is Mary.*

5.2 TFRs with negatively characterized pivots

We now turn to a consideration of data in which the equational or predicational relation within CP is explicitly denied, so that the counterpart defined within CP is something other than the denotatum of the pivot, while being still potentially distinct from the unspecified counterpart denoted by the value of the complex DP; a case in point is (57).

(57) Alex bumped into [what he thought wasn't {a dog, Fido}].

In this case, unlike in constructions like (50a), there is no specific entity that Alex bumped into in his think-worlds (at the moment of bumping), except in the very special context where Alex assumes that there are only two entities he could in principle have bumped into, say, Fido and Minnie. In such a context, the version of (57) with *Fido* says that Alex thinks he bumped into Minnie. In the general case, however, and especially in contexts where Alex makes no assumption about the entity he bumped into beyond assuming it was not Fido/a dog, the entity that Alex thinks he bumped into may be any of an arbitrarily large number of things that are not Fido/a dog.

In an earlier version of this paper, I proposed to capture this variability by assuming that CP must be allowed to denote a non-singleton of individual concepts, all of which have the same matrix value (i.e., the entity that Alex actually bumped into), but are distinct from each other in Alex's think-worlds. On this view, existential quantification is needed to randomly pick out one of these concepts, since using a sigma would give rise to the incorrect meaning that Alex thinks he bumped into everything that he viewed as different from Fido/a dog.

However, a reviewer pointed out that this analytical distinction between data like (57) and (50a) is not necessary, and that the two alternative analytical approaches proposed for (50a) in section 5.1 may also be assumed for (57), variability being expressible by simply assuming that a unique individual concept takes different values in different think-worlds of Alex. As the reviewer further notes, this approach, while compatible with the view that [MAX] is present in TFRs, does not necessitate it, just as I proposed to assume with respect to data like (50a). Since the reviewer's suggestion allows for a more unified analysis of TFRs, I propose to adopt it.

I provide in (57'b-d) the derivational analysis of (57'a) (= (57)), using – for concreteness – the approach that analyses DP by means of existential quantification. In the derivation below, P is a variable of type <<s,e>,t>.

(57') a. Alex bumped into [what he thought wasn't {a dog, Fido}].

b. CP $\rightarrow \lambda\mathbf{x}.\mathbf{C(x)} \wedge \forall w' \in \text{THINK}_{w,alex}$: {~(DOG$_{w'}$(**x**(w')), **x**(w') ≠ f}

c. DP $\rightarrow \lambda P \exists\mathbf{x}[\mathbf{C(x)} \wedge \forall w' \in \text{THINK}_{w,alex}$: {~(DOG$_{w'}$(**x**(w')), **x**(w') ≠ f} ∧ P(**x**)]

d. $\exists\mathbf{x}[\mathbf{C(x)} \wedge \forall i \in \text{THINK}_{w,alex}$: {~(DOG$_{w'}$(**x**(w')), **x**(w') ≠ f} ∧ bumped-into$_w$(alex, **x**(w))]

In words: *Alex bumped into the matrix value of a counterpart individual concept whose values in his think-worlds are different from {a dog, Fido}.*

I will conclude this section by making two brief points, for the sake of completeness.

First, just like TFRs without internal negation, TFRs with internal negation may occur in existential *there*-contexts (cf. (30b) with (58)). In both cases, this state of affairs is predicted by the fact that the denotation of the bracketed constituent is the indefinite value of the TFR.

(58) There is now [what can't possibly be {a dog, Fido}] in my garden.

Second, both kinds of TFRs are in principle compatible with negation in the matrix, at least, on certain readings. For example, (59) seems fine if *didn't bump* is construed as having the force of 'refrained from bumping.'

(59) Alex carefully didn't bump into [what he thought
was(n't) {a dog, Fido}].

5.3 An interlude on vacuity and focus

In section 2.2, I noted that TFRs without an overt intensional operator may be felicitous if a covert operator is suggested saliently enough by the pragmatic context (see examples (36a-b) and comments thereon in the text).

In the absence of a plausible covert operator, TFRs become infelicitous, and so do comparably structured FRs, as can be gathered from (60). In the absence of a special context, (60) is infelicitous, regardless of whether it purports to be a TFR, paraphraseable by (61a), or an FR, paraphraseable by (61b). Note also that the paraphrases are themselves infelicitous.

(60) #Bill is yelling at [what is {*a dog, Fido*}].
(61) a. #Bill is yelling at [something that is {*a dog, Fido*}].
b. #Bill is yelling at [the thing that is {*a dog, Fido*}].

The infelicity of these sentences appears to be due to the fact that they convey no information beyond what is conveyed by substituting the italicized expressions for the bracketed complex DP, as in (62). Alternatively put, the bracketed structures minus the italicized expressions seem to be informationally vacuous.

(62) Bill is yelling at {a dog, Fido}.

To be sure, unnecessary prolixity (which violates Grice's Maxim of Manner) does not always necessarily result in unacceptability, but it seems that in the case of complex DPs that include a relative clause, something like the following (pragmatic) felicity condition holds:

(63) The complex DP minus some phrase properly contained within it
must contribute in *a non-vacuous way* to the building up of the DP

interpretation and/or to the informativeness of the entire sentence.

In any event, I know of at least two other relative clause constructions in which something like (63) has been argued in earlier literature to hold.

One is the EIR construction illustrated in (54). As Grosu and Krifka observe, (64a) (= their (102)) intuitively purports to say no more than (64b) in a context where the fact that Mary is a secretary is assumed by every contextually relevant individual, and is plausibly infelicitous for this reason.

(64) a. #[The secretary that *Mary* is] works for Bill.
b. *Mary* works for Bill.

A second construction to which sensitivity to something like (63) has been attributed in earlier literature is the internally-headed relative clause construction of Japanese. Grosu & Hoshi (ms., section 8) argue that when the internal head of such a construction is a referential expression, e.g., a referentially used proper name or demonstrative expression, the remainder of the construction makes a vacuous contribution to the meaning of the complex DP, with resulting infelicity. For detailed discussion and illustration, see Grosu & Hoshi's study.

Nakau (1971) observed that sentences like (60) are improved if the copula (or some part of the pivot) is contrastively stressed, as in (65) (the acceptability mark is his); the parenthesized continuations provide illustrations of what the items in focus may be understood to be contrasted with.

(65) a. ?Bill is yelling at what IS {a dog, Fido} (even if some people think it can't possibly be that}
b. ?Bill is yelling at what is {A DOG, Fido} (even I some people think it is {a cat, Minnie}).

In checking with a number of native speakers, I found out that the acceptability of data like (65) ranges from completely unacceptable to marginal to fully acceptable. According to Rooth (1992), such sentences have an ordinary and a focus value. In the case of (65a), the ordinary value is (66a), and the focus value is the set in (66b).

(66) a. Bill is yelling at what is Fido.
b. {Bill is yelling at what is Fido, Bill is yelling at what isn't Fido}.

I conjecture that the speakers who dislike data like those in (65) feel that these data are informationally equivalent to (65'), and thus in violation of (63), and that those who accept (65) feel that in using it, they make more explicit the fact that they are directly responding to a contrasting claim concerning the characterization or identity of the entity in question than they would make by simply uttering (65').

(65') Bill is yelling at {A DOG, FIDO}.

Be this as it may, some analysis of these data is needed for the speakers who find (65) acceptable, and I suggest something like (66') for (66), where w' is a variable over worlds that have been made contextually salient, in the typical case, by being contained in the set of worlds denoted by a proposition that someone has asserted, and which is thus a candidate for being added to the Common Ground.

(66') $\exists \mathbf{x}.\mathbf{C}(\mathbf{x}) \wedge [\text{yell-at}_w(b, \mathbf{x}(w)) \wedge \{\text{DOG}_w(\mathbf{x}(w)), \mathbf{x}(w) = f\}]$

Inference: $[\exists w'.\ \text{yell-at}_{w'}(b, \mathbf{x}(w')) \wedge \{\sim\text{DOG}_{w'}(\mathbf{x}(w')), \sim(\mathbf{x}(w') = f)\}]$

In words: *Bill is yelling at {a dog, Fido}, which is the value in w of a counterpart individual concept whose value in a presupposed alternative set of worlds is different from {a dog, Fido}.*

(66') takes advantage of the fact that focus makes available an alternative set of propositions, each of which is a function from distinct worlds, thereby making it in principle possible to express two guises of something. Note that the variable **x** in the meaning and in the contextually salient inference are bound by a common (existential) quantifier. For detailed discussion of such situations and a proposed formalization, see Dekker (2008).

5.4 TFRs with a (strong) generalized quantifier as pivot

In section 5.1, we considered data whose pivot was either a definite or an indefinite nominal expresion, and whose ZP could be interpreted by relying either on equation or on predication. A nominal pivot can also be (strongly) quantified, as in (67) (and as earlier illustrated in (26)-(27)).

(67) Mary spoke with [what$_k$ she thought
[$_{ZP}$ t$_k$ were **{all, most} parliament members**]]

Much as in (50a), we have two potentially distinct guises, one being the unspecified entity or entities that Mary spoke with in the world of evaluation and most/all parliament members in Mary's think worlds. The meaning of (67) may be paraphrased as in (68).

(68) Mary spoke with a group/sum of entities that she thought consisted of all/most parliament members (but it was in fact {just a bunch of tourists/monkeys, fewer than half of the parliamentarians}).

If the boldfaced generalized quantifiers in (67) are down-shifted to sets of individuals whose members are most/all contextually relevant parlamentarians, the interpretation of (67) can follow the kind of derivational pattern exhibited in (56)-(57), with a predicational interpretation of ZP. The versions with *all* and *most* are comparable to (56a) and (57) respectively in that the value of the individual concept in Mary's think-worlds exhibits no variability in the former case, but does in the latter, since there is a (potential) plurality of sums of entities that constitute a majority of parlamentarians. In view of this similarity to earlier discussed examples, I confine myself to exhibiting the translations of the complete sentence in the two versions of (67), using, as before, existential quantification of the complex DP; this is done in (69)-(70), where the presence/absence of the superscript ^{D} corresponds, respectively, to a distributive reading (with ^{D}) on which Mary spoke with all the entities that she thought were in ALL/MOST-PARLAMENTARIANS and a reading (without ^{D}) on which she spoke with those entities as a group.

(69) $\exists \mathbf{x}[\mathbf{C(x)} \wedge {}^{(D)}\text{SPOKE-WITH}_{w}(\text{mary}, \mathbf{x}(w)) \wedge \forall w' \in \text{think}_{w,m}:$
$\text{MOST-PARLAMENTARIANS}_{w'}(\mathbf{x}(w'))]$

In words: *Mary spoke with the matrix value of an individual concept whose value in Mary's think worlds consists of all the parlamentarians.*

(70) $\exists \mathbf{x}[\mathbf{C(x)} \wedge {}^{(D)}\text{SPOKE-WITH}_{w}(\text{mary}, \mathbf{x}(w)) \wedge \forall w' \in \text{think}_{w,m}:$
$\text{MOST-PARLAMENTARIANS}_{w'}(\mathbf{x}(w'))]$

In words: *Mary spoke with the matrix value of an individual concept whose values in Mary's think worlds consist of some majority of parlamentarians.*

5.5 TFRs that denote properties

In this section, we address TFRs whose pivots are of category AP or AdvP. Much like simplex adjectives and adverbs, such TFRs may serve as properties predicated of a subject, or as modifiers of sets of entities or events. In view of the fact, noted in section 1, that TFRs need to be homocategorial with their pivots, the syntactic structure in (17) must be generalized to something like (71), where DP generalizes to XP and $\varnothing_X$ is an appropriate functional category whose semantics is essentially that of D in (17).

(71) $[_{XP}\ \varnothing_X\ [_{CP}\ \text{what}_i\ \ldots\ [_{ZP}\ t_i\ \text{(BE)}\ \mathbf{YP}\ \ldots]\ldots]$

As a preamble to analysing adjectival TFRs, we will take a look at adjectival FRs predicated of a matrix subject, in particular, at (72).

(72) [$_{IP}$ Bill is precisely [$_{XP}$ $\varnothing_X$ [$_{CP}$ what$_i$ Jack is t_i]]]
(e.g., quick, brave, brilliant, etc.).

Let t_i denote a variable ***P***, of type <s, <e,t>>, which will be evaluated at w, since there are no other contextually relevant accessible worlds. We obtain the following derivation.

(73) a. *Jack is* $t_i \rightarrow \boldsymbol{P}_w$(jack)
b. CP $\rightarrow \lambda\boldsymbol{P}.\boldsymbol{P}_w$(jack)
c. XP $\rightarrow \sigma(\lambda\boldsymbol{P}.\boldsymbol{P}_w(\text{jack}))$
d. IP $\rightarrow [\sigma(\lambda\boldsymbol{P}.\boldsymbol{P}_w(\text{jack}))]_w$(bill)

We now turn to TFRs, and start by addressing the example in (74), where the XP is also predicated of the matrix subject.

(74) This house is [$_{XP}$ $\varnothing_X$ [$_{CP}$ what$_k$ Bill *would* consider [$_{ZP}$ t_k **beautiful**]]].

This example, as well as others to be considered below in this section, differ semantically from those discussed in earlier sub-sections of section 5 in the following way: In earlier examples, the two guises can differ significantly in their denotation. In (50a), e.g., one guise is a dog/Fido, while the other, denoted by the TFR, may be anything that one can bump into, in particular, a garden-gate. In (74), however, the TFR denotes a sum of unspecified physical properties of the house, e.g., oval windows, grey walls, an orange roof, wide terraces, etc., and these properties are **constant** in all contextually accessible worlds. The distinct guises concern the **evaluation** of houses possessing these properties in distinct worlds. Thus, in Bill's world view, such houses are beautiful, but other people may find them ugly. One way of describing the difference between (74) and the data addressed in sections 5.1 – 5.4 is that the latter are analyzable by intensionalizing the subject of ZP, while the former is only analyzable by intensionalizing the pivot.

Concerning the analysis of ZP in this example, a predicational analysis seems to be the optimal one. Under an equational analysis, it is implied that the sum of relevant properties possessed by the house is a sufficient **and** necessary condition for Bill to find a house beautiful, so that there is a unique sum of properties in all contextually relevant worlds that make a house beautiful in Bill's eyes. Under a predicational analysis of ZP, the possibility is left open that there may be a plurality of sums of properties that constitute sufficient, but not necessary, conditions for Bill to find a house beautiful, e.g., being small, endowed with a cupola and surrounded by a lush garden, or being more than twenty stories high and possessing highly orna-

mented balconies, etc. Since the latter type of interpretation, paraphraseable by (75), is the more general one, it is to be preferred to the former type.

(75) This house has some property (or sum of properties) that makes it count as beautiful in Bill's world view.

Note that in view of the fact that this property has a constant value in all contextually accessible worlds, there is no way of capturing the meaning that its matrix value is merely one out of a possible plurality of property-values other than by assuming that CP is not a singleton, and that XP is existentially quantified. To achieve this end, the feature [MAX], which I earlier proposed **need not** be present in the constructions addressed in section 5.1 – 5.4, **should not** be present in the type of construction under consideration here.

For completeness, and in response to a question asked by one of the reviewers, I note that the TFR in (76a) is construable as indefinite and as taking scope either above or below the distributive universal quantifier, as shown by the paraphrases in (76b) and (76c) respectively.

(76) a. Every house in this museum is [what Bill might consider beautiful].
b. There is some collection of properties that makes Bill view a house as beautiful and every house in this museum has it.
c. Every house in this museum has some collection of properties that makes Bill view a house as beautiful.

One way to capture the facts brought up in the three preceding paragraphs is to interpret the gap in [$_{ZP}$ t_k as beautiful] as a property variable ***P*** of type <s,<e,t>>, and the pivot's value in ZP as a second order property of type <<s,<e,t>>,t>, yielding (77) as the translation of ZP.

(77) ZP $\rightarrow$ BEAUTIFUL$_{w'}$(***P***)

(77) is a generic statement whose meaning is essentially as shown in (78).

(78) If a house has $\boldsymbol{P}_{w'}$ then, *ceteris paribus*, it is beautiful in w'.

However, countenancing second order properties and thereby adopting a theory that allows properties of any higher order is arguably a conceptually non-optimal step, as pointed out by Chierchia (1985) (thanks to an anonymous reviewer for reminding me of this). Chierchia develops a theory which allows 'unsaturated' properties, i.e., objects of type <s,<e,t>>, to be turned into 'saturated' ones, of type <s,e>, by means of a process of nominalization, indicated by the 'cap' symbol $\cap$. The theory also allows nominalized properties to be shifted back to their unsaturated image, a process indicated by the

'cup' symbol $\cup$. This theory makes it possible to avoid the non-optimal step noted above in the following way: The gap in ZP is interpreted as a variable over **nominalized properties**, represented as $\cap\boldsymbol{P}$, which has the type of individual concepts, and the pivot's value in ZP is a first order property of type <<s,e>,t>.

The derivation of (74), starting at the CP level, is shown in (79).

(79) a. CP $\rightarrow \lambda\cap\boldsymbol{P}.\forall w' \in$ BILL-VIEW$_w$: BEAUTIFUL$_{w'}(\cap\boldsymbol{P})$
type <<s,e>,t>

b. XP $\rightarrow \lambda x.\exists\cap\boldsymbol{P}\ [\cup(\cap\boldsymbol{P}_w)(x) \wedge \forall w' \in$ BILL-VIEW$_w$:
BEAUTIFUL$_{w'}(\cap\boldsymbol{P})$] type <e,t>

c. *this house* $\rightarrow$ h type e

d. IP $\rightarrow \exists\cap\boldsymbol{P}\ [\cup(\cap\boldsymbol{P}_w)(h) \wedge \forall w' \in$ BILL-VIEW$_w$:
BEAUTIFUL$_{w'}(\cap\boldsymbol{P})$] type t

In words: *There is a nominalized property of individuals **P** such that this house is in the value at w of its unsaturated image, and according to Bill, a house is beautiful if it is in the value of the unsaturated image of P (which is constant at all accessible indices).*

Property-denoting TFRs can be used not only as predicates of subjects, but also as adjectival adnominal modifiers and as adverbial modifiers, as in (80) and (81). As noted in section 3.3 in relation to (42), speakers tend to dislike data like the reduced version (80), while accepting the full version, a state of affairs which suggests that the reduced version is grammatical, but infelicitous for stylistic reasons. I thus feel entitled to analyze the reduced version of (80).

(80) This is a [$_{NP}$[$_{XP}$ (new and) what Bill *would consider* beautiful] house].
(81) She spoke with him [what one *might describe* as privately].

The derivation in (79) extends straightforwardly to the reduced version of (80) (and, with adjustments, to (81)). The only relevant part of the derivation of (80) is the translation of XP, which is the same as (79b), and is reproduced as (82a) below. (82a) shifts to modifier status and combines with the noun *house* by intersection, yielding (82b) as the translation of NP. The translation of IP is obtained by applying (82b) to the matrix subject.

(82) a. XP $\rightarrow \lambda x.\exists\cap\boldsymbol{P}\ [\cup(\cap\boldsymbol{P}_w)(x) \wedge \forall w' \in$ BILL-VIEW$_w$:
BEAUTIFUL$_{w'}(\cap\boldsymbol{P})$] type <e,t>

b. NP $\rightarrow \lambda x.$ HOUSE$(x) \wedge \exists\cap\boldsymbol{P}\ [\cup(\cap\boldsymbol{P}_w)(x) \wedge \forall w' \in$ BILL-VIEW$_w$:
BEAUTIFUL$_{w'}(\cap\boldsymbol{P})$] type <e,t>

c. this $\rightarrow$ th type e

d. IP $\rightarrow$ HOUSE$(th) \wedge \exists\cap\boldsymbol{P}\ [\cup(\cap\boldsymbol{P}_w)(th) \wedge \forall w' \in$ BILL-VIEW$_w$:

$\text{BEAUTIFUL}_{w'}(\cap \boldsymbol{P})]$ type t

In words: *This is a house and there is a nominalized property of individuals **P** such that this house is in the value at w of its unsaturated image, and according to Bill, a house is beautiful if it is in the value of the unsaturated image of P (which is constant at all accessible indices).*

The derivation of (79a) is similar, *mutatis mutandum*.

6. TFR semantics in the pivot-as-head and pivot-in-situ approaches

The semantics of English TFRs within a pivot-in-situ approach was examined in some detail in section 5, where it was also contrasted with the semantics of *what*-FRs. The various derivations in section 5 brought out the fact that the uncertain nature of the guise denoted by the TFR is naturally captured by the fact that the meaning of DP is built by means of D and *what*, which are severely under-specified. The slightly different properties of Romance constructions like (39)-(40) can be captured by assuming that the light D head retains its incompatibility with a human value of the TFR.

If the semantics of FRs and TFRs proposed in sections 4 and 5 are on the right track, how can it be captured within the framework of a pivot-as-head approach, in particular, the one which assigns to TFRs and FRs the structures in (14a-b) respectively?

(14) a. $[_{\text{Matrix Clause}}$ ..... $\mathbf{YP_k}$ .....$]$
$[_{\text{CP}}$ what_i ... $[_{\text{ZP}}$ what_i (BE) $\mathbf{YP_k}$ ...$]$...$]$

b. $[_{\text{Matrix Clause}}$ ..... what_i .....$]$
$[_{\text{CP}}$ what_i ... what_i ...$]$

The interpretation of FRs on the basis of (14b) is a reasonably straightforward matter. The three tokens of $what_i$ arise by virtue of one instance of Merger and two instances of Re-Merger, and thus form a sort of 'multi-dimensional chain.' Since Chomsky (1993), it is widely assumed that within CP, the initially merged token is construed as a variable, and the one in [Spec, CP], as a trigger for abstraction over this variable. The matrix token can then also be given an interpretation distinct from the interpretation of the other two tokens, in particular it may be construed as a definite D that applies to CP.

The interpretation of TFRs on the basis of (14a), however, requires more questionable steps. Without attempting to address all conceivable interpretive avenues, I will indicate what strikes me as the most economical way of achieving this result. Specifically, one may construe CP exactly as in section 5, and interpret the matrix token of $\mathbf{YP_k}$ in the way $\varnothing_{D/X}$ was in section 5. This is not different from what I suggested in the preceding paragraph in

relation to FRs, but the catch is that the matrix token of $\mathbf{YP_k}$ needs to semantically bind a variable that it does not syntactically bind, a move which, to my knowledge, is without precedent in the literature, and arguably has a Procrustean flavour to it. Furthermore, this line of analysis also requires a non-standard translation of the light demonstrative head that occurs in Romance TFRs (see (39)-(40)), which instead of being construed as a D, needs to be construed as a modifier of CP, with roughly the import indicated in (83), where □ is a modal logic necessity operator:

(83) Dem $\rightarrow$ λP.P: $\forall$x $\in$ P: ~[□HUMAN(x)]

The interpretation of TFRs on the basis of (14a) thus requires at least two arguably unnatural steps, which are both straightforwardly avoided if the syntactic basis for interpretation is (17)/(71).

7 Summary of results

In section 2, I proposed to pursue three inter-related goals, which I reproduce below for convenience.

[i] To provide a sharper characterization of how TFRs differ from comparably structured FRs than has so far been proposed in past literature.
[ii] To provide a detailed compositional semantics for TFRs, in particular, one that goes substantially beyond Grosu (2003, section 6) in breadth, depth and adequacy.
[iii] To carry out as comprehensive a comparison as possible between pivot-as-head and pivot-in-situ approaches, focusing on the abilities of the two approaches to account for the syntactic, morphological, semantic and pragmatic properties of TFRs, as well as for the distinctions between TFRs and comparably structured FRs.

With respect to [i], it was proposed that TFRs, unlike FRs, need to provide (at least) two potentially distinct guises of something, the characterization of one of them being free of presuppositions (except for restrictions imposed on it by the larger context), a state of affairs that results in an indefinite interpretation of the matrix value of the TFR.

Analytically, it was proposed that TFRs differ from FRs in the following ways: (i) the variable abstracted over needs to be of the type of individual concepts, (ii) CP must include an explicit or implicit intensional operator, (iii) the feature [MAX], which is necessarily present in FRs, need not, and in certain cases, should not be assumed for TFRs, and (iv) *what* lacks much of the featural content it has in FRs. The indefinite interpretation of the matrix value of TFRs is traceable to the conjunction of (i) and (ii).

With respect to [ii], section 5 offered explicit analyses for a number of varieties of TFRs. For the varieties that denote 'ordinary' individuals, which were discussed in sections 5.1 – 5.4, it was shown that the double-guise effect can be captured by intensionalizing the subject of ZP. For those that denote properties, it was argued in section 5.5 that it is the pivot that needs to be intensionalized.

With respect to [iii], a comprehensive comparison of the two approaches was undertaken in section 2 with respect to most aspects of TFRs, and this task was further pursued in section 6, where the two approaches were compared in relation to their ability to support the semantics proposed in sections 4 and 5. It was argued that while a pivot-as-head approach can successfully handle matching effects in syntactic category and number, it faces syntactic and morphological problems, and has no obviously natural semantic treatment of TFRs. In contrast, it was argued that the pivot-in-situ approach has a viable alternative treatment of the matching effects in syntactic category and number, that it naturally avoids the syntactic and morphological problems faced by the alternative approach, and that, last but not least, it is able to handle the semantics of TFRs in a natural way.

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