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PROPER NAMES AS RIGID PRESUPPOSITIONS*

Emar Maier,
Radboud University Nijmegen & University of Amsterdam

emar.maier@gmail.com

Abstract

Since Kripke introduced rigid designation as an alternative to the Frege/Russell analysis of referential terms as definite descriptions, there has been an ongoing debate between 'descriptivists' and 'referentialists', mostly focusing on the semantics of proper names. Nowadays descriptivists can draw on a much richer set of linguistic data (including bound and accommodated proper names in discourse) as well as new semantic machinery (E-type syntax/semantics, DRT, presupposition-as-anaphora) to strengthen their case. After reviewing the current state of the debate, I argue for a referentialist semantics that incorporates some modern insights from the side of the descriptivists in order to account for the new data in a principled fashion.

1 From Frege/Russell to Kripke/Kaplan

Before Frege, proper names (*Luke*, *Amsterdam*,...) were commonly regarded as purely referential devices, i.e. their function is to designate a certain individual and that is all there is to their meaning. The main problems for this view are the obvious meaningfulness of names without bearers (e.g. in negative existential statements: *Santa Claus doesn't exist*), and cases of mistaken reference, like *Hesperus* and *Phosphorus*, both referring to the same planet, Venus, though we can safely say that the Babylonians believed that Hesperus and Phosphorus were distinct bodies, but not that Venus and Venus were distinct bodies. These and similar puzzles led Frege to his distinction between *Sinn* and *Bedeutung*. He says that in addition to reference, proper names also have a real meaning, some kind of descriptive content that allows the hearer to determine a referent. Frege's ideas are now commonly cast in a possible worlds framework: Sinn = intension = function from possible worlds to referents in those worlds, $[\![\alpha]\!] :\subseteq W \to D$; Bedeutung = extension = referent in the current world, $[\![\alpha]\!]_w = [\![\alpha]\!](w) \in D$.

In this setup, even if a name happens to lack a bearer (*Santa Claus*) or an unknown bearer (*Hesperus*/*Phosphorus*), it will still have a fully functional meaning, viz. the intension. But what exactly is the intension of a name? What descriptive content does it carry? For Frege, who wants it to play the role of cognitive significance in thought, it is something that differs for from person to person: for me, *Darth Vader* is synonymous with *Anakin*, meaning Luke's father, named Anakin, who was seduced by the Dark Side, though for the young Luke it may just be the Sith apprentice of the evil Emperor. In terms of intensions, Anakin's meanings are: $[\![\texttt{darth\_vader}]\!] : w \mapsto$ the individual in w who is, in w, the Sith apprentice of w's Emperor; $[\![\texttt{anakin}]\!] : w \mapsto$ the Jedi master known in w as 'Anakin Skywalker'.

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Russell takes this one step further, for him proper names are really abbreviations of definite descriptions at the level of logical form:[1] Darth Vader $\rightsquigarrow$ $\iota x \exists y[\texttt{sith}(x) \wedge \texttt{evil}(y) \wedge \texttt{emperor}(y) \wedge \texttt{apprentice}(x,y)]$; Anakin $\rightsquigarrow$ $\iota x[\texttt{jedi}(x) \wedge \texttt{hero}(x)]$. From a semanticist's perspective the differences between the Fregean and Russellian analyses disappear on a straightforward semantics of descriptions as denoting individual concepts, i.e. functions from worlds to individuals. A point of substantial disagreement between these and later versions of the descriptivist thesis lies in the exact description associated with a given name. This ranges from the fully personal descriptions we saw above, to the mere 'the person called *Anakin*'. I opt for the latter and associate with every name a condition like $\texttt{anakin}(x)$ meaning '*x* is called *Anakin*'. However, nothing hinges on this particular description, and you're free to interpret the proper name condition whichever way you like throughout this paper.

In the 1970's we see a revival of the so-called Millian analysis of proper names as simply referential. This is due in great part to Kripke's (1972) famous argumentation against descriptivism, in favor of an enhanced account of names as directly referential devices. Kripke convincingly shows that names lack descriptive content and proposes to analyze names within a possible worlds framework as rigid designators instead, i.e. as constants with a trivial, constant intension that has them refer to the same individual at all possible worlds. Thus, a proper name's meaning and reference once again coincide. The main motivation lies in the observation that proper names differ from definite descriptions in the fact that the first but not the latter are impervious to embedding under modal operators:

(1) Some feel that Luke Skywalker should have been given a more Tatooinean name

This sentence is quite true, but a compositional analysis would derive the LF below:[2]

(2) $\exists x[\textsf{feel}_x[\textsf{should}[\texttt{tatooinean\_name}(\texttt{luke})]]]$

On a descriptive analysis of `luke` this says that someone feels it should be the case that the (most salient) individual with the name 'Luke' should have a more Tatooinean name, which fails to ascribe the attitude to Luke, but instead is about whoever has the name 'Luke' in some hypothetical thought contexts. Kripke gets it right by analyzing names as simple constants whose interpretation at any remote possible world of evaluation is the same, viz. Luke Skywalker.

We might try to save descriptivism by introducing a stipulation to the effect that the proper name always takes widest possible scope in the logical form of the sentence:

(3) $(\lambda y[\exists x[\textsf{feel}_x[\textsf{should}[\texttt{tatooinean\_name}(y)]]]])\texttt{luke}$

In addition to being ad hoc and breaking compositionality, a wide scope stipulation will not help against Kripke's next argument, because it has no operators to take scope over. Consider the following sentences:

(4) a. Luke is called Luke
b. The person called Luke is called Luke

Both are well-formed and true (though perhaps a little strange on account of their triviality), but while (4b), on its most natural reading, expresses an analytic, tautological truth (cf. *bachelors*

[1] In Russell's system, definite descriptions in turn expand to conditions in an existential statement, but that doesn't concern us here.

[2] Though Russell's definition of the ι-operator makes this formula ambiguous between the sketched narrow and the correct wide scope reading.

are unmarried), (4a) expresses a contingent fact (for there will be possible worlds where Luke is called, say, Anakin II). A Kripkean analysis treating the name in (4a) as rigidly designating the actual Luke Skywalker and the description in (4b) as an intensional object gets this right, but the descriptivist would predict the sentences to be completely equivalent.

Thus, referentialism beats Frege/Russell descriptivism in linguistic semantic predictive power. Yet it leaves open what is the nature of the relationship between name and bearer. How does 'Luke' get to refer to Luke? Kripke's answer goes beyond linguistic semantics proper: a proper name use is grounded in an initial act of baptism and a causal-historical chain of communications that transmit that original tagging to the current utterance. Note further that Kripke's referentialism suffers the reference problems that had led Frege and Russell to descriptivism in the first place. Numerous fixes, extensions and arguments have been proposed by referentialists, the most straightforward ones consisting in admitting that semantically such sentences may not come out as they should, though they might still be useful pragmatically (Soames 1985). In this paper I steer clear of these issues and restrict attention to names that have a bearer who is familiar in the common ground.

1.1 Indexicals

Kaplan (1989) extends Kripke's analysis to indexicals, which are similarly impervious to all types of embedding:

(5) Some people might think that I like Star Wars

The embedded *I* refers to me, Emar, not some possible entity in John's belief worlds. The problem is that indexicals obviously do have some kind of meaning other than mere reference, *I*, for instance means something like 'the speaker of the current utterance'. In fact, the reference-fixing that relies on a causal chain and dubbing in the case of a proper name, is taken care of by this lexically encoded meaning in the case of an indexical. The meaningfulness and immunity of indexicals naturally leads to a wide scope descriptivist analysis, as was attempted for proper names. However, the Kripkean knock-down argument against (wide scope) descriptivism for proper names applies here as well:

(6) a. I am speaking
b. The current speaker is speaking

These sentences exhibit the same contrast as (4): though neither is particularly informative, and both are true if someone utters them, (6a) is but contingently true (I might have remained silent) while (6b) on its preferred reading expresses a necessarily true, analytic statement. Conclusion: *I* is not synonymous with any definite description.

Since indexicals do refer, this reference must be rigid, which immediately explains the wide scope behavior. To account for the equally obvious context-dependence and linguistic reference fixing, Kaplan devises a two-dimensional semantics in which linguistic meaning is formalized as *character*, functions from contexts to intensions, which as we know are functions from worlds to extensions. In every context of utterance *I* rigidly refers to the speaker of that context. If we now stipulate that linguistic operators are only sensitive to intensional content ('Prohibition of Monsters'), we can unite immunity to embedding with context-dependence through lexical meaning. The central semantic notion becomes truth of a sentence/expression as uttered in a context c, evaluated at world w:

(7) a. I am speaking [=(6a)]

b. $[\![\texttt{speak(i)}]\!]^c_w = 1$ iff $[\![\texttt{i}]\!]^c_w \in [\![\texttt{speak}]\!]^c_w$ iff the speaker of c belongs to the set of speakers in w

Thus Kaplan passes the indexical version of the Kripke test (4), for the proposition expressed in a context is the set of worlds where the formula is evaluated true ($=\{w \mid [\![\varphi]\!]^c_w = 1\}$), which is a contingent proposition about a single individual for (7), but which will be tautological for its descriptive counterpart (6b). Note finally that the indexical `i`'s interpretation depends only on the context parameter (in other words, it is rigid with respect to evaluation in possible worlds), while the predicate is truly intensional but not context dependent. We'll return to two dimensional Kaplanian semantics, and to this observation in particular, in 3.

2 Names and other definites

Kripke's direct reference paradigm seemed theoretically and empirically superior to the descriptivist alternatives of the time. However, new data and new insight in the semantics of definites and pronouns slowly led to interesting new descriptivist proposals. In this section we take a look at two accounts of proper names that take their cue from the similarities between names and third person pronouns. Though this by itself doesn't put them in the descriptivist camp, it does constitute a move away from the direct reference paradigm in that in that framework names refer while anaphoric pronouns are bound variables. I will argue that these two recent pronoun-based semantic analyses are truly descriptivist.

Sommers (1982) was the first to note that, just like third person, anaphoric pronouns, names tend to pick up their referent from the common ground, i.e. it is hard to imagine that I go up to a stranger talking about 'Horace' or 'she' without prior introduction or pointing. First I need to introduce a particular individual to the conversation, after that I can use the name or a pronoun, e.g. as in the following mini-discourse:

(8) I have a poodle named Horace. {Horace/She} is five years old [(Geurts 1997)]

Note already that the analogy between names and pronouns is not perfect. For one, the distribution of proper names is generally more restricted. Once an individual is firmly established in the common ground, pronouns are usually the preferred way to pick it up.[3] This might be explained as an effect of some 'referential hierarchy' (Prince 1981, Zeevat 1999) or of what syntacticians used to call Principle C, both of which rule out proper names when pronouns would be felicitous:

(9) Luke thought {he/*Luke} was safe

Back to the similarities. An important characteristic names share with pronouns is the referentialist's starting point, that names generally do not contribute to the truth-conditional content, the proposition expressed. Since bound pronouns are represented as bound variables and bound variables contribute nothing but their assigned referent to the truth-conditions this holds for bound pronouns. But how about non-c-commanded pronouns such as the one in (8) or in donkey sentences?

(10) Every man who owns a donkey beats it

[3] There are of course also cases where proper names are preferred, for instance when there are several possible antecedents equally salient and with the same gender and person features.

Here it depends on your semantic framework: in dynamic semantics this discourse binding is treated as variable binding as well, so the same idea would apply. In a more traditional static framework these pronouns are sometimes referred to as 'E-type' which means they are analyzed as hidden descriptions.[4] Both the dynamic and the static approaches have been worked into an arguably descriptivist unified semantics of various definites (indexical, anaphoric and E-type pronouns as well as definite descriptions and names). Before we switch to dynamic semantics, let's first take a look at the more conservative E-type analysis of (Elbourne 2006).[5]

2.1 Names as E-type pronouns

Elbourne (2006) provides a unified analysis of third person pronouns, definite descriptions and proper names, in effect treating them all as descriptions. He starts from the well-known analysis of donkey pronouns as hidden descriptions, analyzing the *it* in (10) as *the donkey*. With the help of a fine-grained situation semantics, this picks out exactly those donkeys made available by the quantifier's restrictor, without letting go of the notion of binding as c-command. ELbourne's particular brand of E-type semantics holds that (i) a donkey pronoun has the syntax and semantics of the determiner *the*, and (ii) it is followed by a phonologically deleted NP at LF. The LF of (10) thus ends in ... *beats [it donkey]*, meaning ... *beats the donkey*. Indices are added to signify whether a hidden or overt description is bound ($i > 0$, co-indexed), E-type ($i = 0$), or referential ($i > 0$, free), like so:

(11) it $\rightsquigarrow$ [it ~~donkey~~]$_i$ [note: ⟦it⟧=⟦the⟧]
$i = 0$: $\iota x[\mathtt{donkey}(x)]$
$i > 0$: $\iota x[\mathtt{donkey}(x) \wedge x = x_i]$

But what about proper names? Like pronouns and overt definite descriptions they are definite NPs and they occasionally exhibit donkey-binding:

(12) a. If a child is christened Bambi and Disney Inc. find out about it, they will sue Bambi's parents [(Geurts 1997)]
b. Every woman who has a husband called John and a lover called Gerontius takes only Gerontius to the Rare Names Convention [(Elbourne 2006)]

This is a crucial new piece of empirical evidence against Kripkean referentialism, for it shows a proper name (the second occurrence of *Bambi*/*Gerontius*) not used to refer to an individual in the actual world or even in the common ground representation thereof. In positive terms, it's further evidence for Sommers' analogy between pronouns and names, for it shows that names, like pronouns (and definite descriptions) have referential as well as '(donkey-)bound' uses. Note that the basic Frege/Russell descriptivist account is already pretty well-suited to account for these cases, for a narrow scope construal of the second name's associated descriptive meaning, *the person called Gerontius*, derives the right reading (apart from some uniqueness issues dealt with by using 'minimal situations' (Heim 1990)). The final ingredient of Elbourne's E-type/descriptive semantics of proper names is Burge's (1973) analysis of names as nouns so let's briefly cover that first.

[4]Calling them 'E-type pronouns' suggests they are a different kind of pronouns from, say, anaphoric and indexical ones, but that of course is entirely theory dependent. In dynamic frameworks the intuitively bound pronoun in a donkey sentence is simply anaphoric.

[5]2.1 is based on and refines my review of Elbourne's book (Maier 2006).

Burge points out that in English names may be pluralized (13a) and quantified (13b) as if they were common nouns, and in other languages even the normal referential use is expressed with a definite determiner modifying the name (13c):

(13) a. There are relatively few Alfreds in Princeton [(Burge 1973)]
b. An Alfred Russell joined the club today [(Burge 1973)]
c. Der Alfred ist toll [cf. (Larson and Segal 1995)]
d. Alfred is cool

Burge concludes that names really are common nouns syntactically and semantically, so that *Alfred* refers to the property of being called Alfred. The referential, bare proper name we see occupying an NP slot in (13d) then must actually contain a phonologically deleted determiner at LF. Burge claims it's a demonstrative determiner, in order to account for direct reference, while Larson and Segal (1995) claim it's just a definite determiner. This last option seems to lead to a classical Frege/Russell analysis, which will do justice to the donkey names in (12) but is easily defeated by the Kripkean argument. Elbourne takes this option nonetheless, but indexes all his definites, using unbound indices > 0 force rigidity. Summarizing Elbourne's unified[6] proposal:

(14) a. it $\rightsquigarrow$ [it ~~donkey~~]$_i$
b. the woman $\rightsquigarrow$ [the woman]$_i$
c. Luke $\rightsquigarrow$ [~~the~~ Luke]$_i$ [note: $[\![\text{Luke}]\!]=\lambda x[\texttt{luke}(x)]$]
$i = 0$: $\iota x[\texttt{luke}(x)]$
$i > 0$: $\iota x[\texttt{luke}(x) \wedge x = x_i]$

We get the correct reading for the examples in (10), (8), and (12) if the bound pronouns and names bear the 'E-type index' 0. Syntactically bound (c-commanded) pronouns are also taken care of through co-indexing. As pointed out before, syntactic binding of proper names and of definite descriptions may be blocked for independent reasons, but should they rear their heads, they would be accommodated in the theory. On to the referential cases, supposedly handled by free indices. Elbourne doesn't talk much about referential pronouns, and they are not currently our concern either, for proper names he does claim a free index will indeed ensure rigidity. But does it? Let's apply the ultimate litmus test: the subtle contrasts of (4) showing the non-equivalence of *Luke* and *the person called Luke*. Following (14) we'll see that the E-type analysis can predict a contrast, and moreover it assigns a contingent proposition (of sorts) to (4a) and can assign a necessary one to (4b) (by choosing index 0). Unfortunately, his analysis doesn't predict exactly the right reading for (4):

(15) Luke is called Luke [$\approx$(4a)]
LF: [~~the~~ Luke]$_1$ is called Luke
lf: $\texttt{luke}(\iota x[\texttt{luke}(x) \wedge x = x_1])$
$[\![(15)]\!]^g_w = 1$ iff $g(x_1)$ defined and $g(x_1)$ is called Luke in w

So far so good, but under what conditions would this sentence be false? In order for the sentence to have any truth value in w, the description must be defined, i.e. there must be one (unique or most salient) x fulfilling its condition,[7] which means $g(x_1)$ must be called Luke. But then

[6] One point of criticism might be that the definition by cases ($i = 0$ and $i > 0$) in fact amounts to a genuine ambiguity in disguise, so the E-type and referential/bound uses are not given a fully unified analysis after all. However, the analysis still counts as a unification of definite descriptions, names and pronouns.

[7] Unless we adopt the real Russellian approach which makes *the king of France is bald* false when there is no such king. Nowadays, however, we favor an account where non-existence or non-familiarity of the entity described

that would immediately make it true, so the sentence is predicted always to be either true or undefined, but never false. In reality, there are plenty of worlds where Luke ($g(x_1)$) was given a different name and in which the sentence should come out false. The reason why this E-type analysis fails is that even with the addition of free indices the descriptive content associated with the proper name still enters the truth conditions, thus trivializing them.

In order to set the stage for the dynamic rival approaches below let me mention another objection, concerning accommodation. In his refutation of referentialism Geurts (1997) cites the following as an example of a proper name neither directly referential nor bound.

(16) If presidents were elected by alphabetical order, Aaron Aardvark might have been president [(Bach 1987)]

The name A. Aardvark here does not refer to a particular entity already established in the common ground/context. Moreover, the descriptive content of the proper name (having that name) plays a crucial role in determining the proposition expressed: that the mere property of having that name might land you the presidency. This is not too different from the bound Bambi and Gerontius examples in which the name itself played a special, metalinguistic role, yet here there is no available antecedent to bind to. It seems as though we are forced to create such an antecedent on the basis of the surrounding discourse context and world-knowledge. In this case it's not hard to infer that in the hypothetical world with alphabetical elections there might be someone called Aaron Aardvark and if so, *he* might have been president. We have, so to speak, *accommodated* the descriptive content of the name in the antecedens.

Now, to turn this somewhat vague meta-semantic story into a real account we need a framework that can deal with context change more naturally. This is where dynamic semantics and presupposition theory comes in. In the next section we'll see how Geurts and others account for (16) and (12) in a principled and unified fashion.

2.2 Names as presuppositions

Dynamic semantics and presupposition theory have given rise to another fruitful analysis of proper names as presupposition inducers, on a par with other definites. In this section we'll see how far this can take us.

Geurts's (1997) semantics of proper names as presuppositions is couched in Kamp and Reyle's (1993) DRT with van der Sandt's (1992) theory of presupposition-as-anaphora. One example should suffice to illustrate that framework. Imagine a discourse context where a man and a poodle have been introduced. This is represented as follows:

(17) a. There's a man and a poodle
b. $\left[\mathtt{x\ y} \middle| \mathtt{man(x)}, \mathtt{poodle(y)}\right]$

This forms the input context for the interpretation of the rest of the discourse. A sentence is given a *preliminary representation* where the contribution of pronouns and other definites is marked as presuppositional. The next step is to connect input context and sentence representation and *resolve* the latter's presuppositions, i.e. try to bind presupposed discourse referents to already established ones by matching the associated contents (*dog-poodle*):

(18) a. The dog is called Horace
b. **Prel**((18a)) = $\left[\middle| \mathtt{horace(z)}, \partial\left[\mathtt{z} \middle| \mathtt{dog(z)}\right]\right]$

amounts to presupposition failure, blocking the assignment of a truth value.

c. (17b)$\oplus$(18b)$=\left[\begin{array}{l|l} \mathtt{x}\ \mathtt{y} & \mathtt{man(x)}, \mathtt{poodle(y)} \\ & \mathtt{horace(z)}, \partial\left[\mathtt{z}\middle|\mathtt{dog(z)}\right] \end{array}\right] \rightsquigarrow_{\mathtt{z}\mapsto\mathtt{y}} \rightsquigarrow \left[\begin{array}{l|l} \mathtt{x}\ \mathtt{y} & \mathtt{man(x)}, \mathtt{poodle(y)} \\ & \mathtt{horace(y)} \end{array}\right]$

If binding should fail we fall back on accommodation, i.e. the creation of a suitable antecedent by simply dropping the presupposed referent and content at a suitable position in the DRS.

On to names. Like Elbourne, Geurts follows Sommers' idea that names behave rather like pronouns to arrive at a unification of names, definite descriptions and pronouns, but now all as presupposition triggers:

(19) a. Horace is three years old
b. **Prel**((19a)) = $\left[\middle|\mathtt{three\_years(u)}, \partial\left[\mathtt{u}\middle|\mathtt{horace(u)}\right]\right]$

The benefit of this analysis over naïve descriptivism is that we derive the wide scope behavior of names from the general pragmatic mechanisms of presupposition projection, fully worked out in the theory of presupposition-as-anaphora. Moreover, this is achieved without a need for ambiguities and with fully compositionally generated preliminary DRSs. One big advantage over the static E-type analysis is the unified analysis of syntactic and donkey binding as simply variable binding (brought about by presupposition binding) that is the hallmark of dynamic semantics.

(20) a. If a child is christened Bambi and Disney Inc. find out about it, they will sue Bambi's parents
b. $\left[\middle|\left[\begin{array}{l|l} \mathtt{x} & \mathtt{child(x)}, \mathtt{bambi(x)}, \mathtt{find\_out(y)} \\ & \partial\left[\mathtt{y}\middle|\mathtt{disney(y)}\right] \end{array}\right] \Rightarrow \left[\begin{array}{l|l} & \mathtt{sue\_parents\_of(y,z)} \\ & \partial\left[\mathtt{z}\middle|\mathtt{bambi(z)}\right] \end{array}\right]\right] \rightsquigarrow_{\mathtt{z}\mapsto\mathtt{x}}$
$\rightsquigarrow \left[\mathtt{y}\middle|\mathtt{disney(y)}\ \left[\mathtt{x}\middle|\mathtt{child(x)}, \mathtt{bambi(x)}, \mathtt{find\_out(y)}\right] \Rightarrow \left[\middle|\mathtt{sue\_parents\_of(y,x)}\right]\right]$

A second advantage over the E-type account is the sound formalization of accommodation that is relegated to meta-semantics in other, even (non-representational) dynamic, frameworks:

(21) a. If presidents were elected by alphabetical order, Aaron Aardvark might have been president
b. $\left[\middle|\left[\middle|\mathtt{presidents\_alphabetical}\right] \Rightarrow \left[\middle|\Diamond\left[\middle|\mathtt{president(x)}, \partial\left[\mathtt{x}\middle|\mathtt{a.aardvark(x)}\right]\right]\right]\right]$
$\rightsquigarrow \left[\middle|\left[\mathtt{x}\middle|\mathtt{presidents\_alphabetical}, \mathtt{a.aardvark(x)}\right] \Rightarrow \left[\middle|\Diamond\left[\middle|\mathtt{president(x)}\right]\right]\right]$

Unfortunately, Geurts' analysis still fails all possible dynamic versions of the Kripke test. The root of the problem lies in the version of the descriptivist premise he adopts, viz. that names are analyzed as presuppositions, *just like* definite descriptions. It is clear that the preliminary DRSs and thus the 'context change potentials' of (4a) and (4b) are exactly the same:

(22) a. {Luke/the person called Luke} is called Luke [cf. (4)]
b. $\left[\middle|\mathtt{luke(x)}, \partial\left[\mathtt{x}\middle|\mathtt{luke(x)}\right]\right]$

Both sentences have the same dynamic meaning, they impose the same restriction on input contexts and transform the same inputs to the same outputs. In particular, adding (22) to a context where a salient individual named Luke exists will have no truth conditional impact at all, while adding it to a context without a Luke will lead to interpretation failure or, depending on the rest of the context, accommodation of this individual. The important thing is that, contrary to Kripkean intuitions, there is no distinction between the name and the corresponding definite description, neither in dynamic sentence meaning, nor in admissible inputs, nor in static output truth conditions.

3 Rigid presuppositions

We have seen that descriptivism had problems deriving the wide scope behavior and the 'rigidity intuition' highlighted by the Kripke test. The first is accommodated in more modern descriptivist analyses like Elbourne's static E-type account and Geurts' dynamic, presuppositional account. I've shown how the second problem still haunts the neo-descriptivist proposals, making them ultimately unsatisfactory. On the other hand, the occasional binding and accommodation of proper names is left unexplained by the referentialists, but follows directly from esp. Geurts' neo-descriptivism. I propose a synthesis of dynamic semantics with presuppositions and direct reference.

3.1 Direct reference in DRT: anchors

Kamp and Reyle (1993) already proposed a way to incorporate a referential semantics of proper names in the otherwise descriptive framework of DRT using *external anchors*. I argue that their account is meta-semantic and ad hoc before proposing a more integrated *layered* account of direct reference in DRT.

Formally, anchors are partial assignment functions, or embeddings as they are often called in DRT semantics, mapping discourse referents to individuals. We can interpret a DRS φ relative to an anchor a containing the free variables of the DRS in its domain. Interpretation of an *anchored DRS*, $\langle \varphi, a \rangle$, proceeds as in standard DRT, (23a), but with the anchor restricting the set of verifying embeddings (23b):

(23) a. $[\![\varphi]\!]^f_w = 1$ iff there is an embedding $g \supseteq_{U(\varphi)} f$ with for all $\gamma \in Con(\varphi)$: $[\![\gamma]\!]^g_w = 1$
   (i) [atomic] e.g. $\gamma = P(x,y)$: $[\![\gamma]\!]^g_w = 1$ iff $\langle g(x), g(y) \rangle \in [\![P]\!](w)$
   (ii) [complex] e.g. $\gamma = \neg\psi$: $[\![\gamma]\!]^g_w = 1$ iff there is no $h \supseteq_{U(\varphi)} g$ with $[\![\psi]\!]^h_w = 1$

   b. $[\![\langle \varphi, a \rangle]\!]$ = the set of w in which there is a truthful embedding $f \supseteq a$ of φ $= \{w \mid [\![\varphi]\!]^a_w = 1\}$

The mechanism of anchoring can be used to fix the reference of a proper name's discourse referent. A proper name, we assume triggers an extension of the anchor linking the name's discourse referent to the designated individual directly:

(24) a. Luke is called Luke
   b. $\langle [\,|\texttt{luke(x)}\,], \texttt{x} \mapsto \mathit{Luke} \rangle$

This gives the correct, referentialist truth conditions: $[\![(24)]\!]_w = 1$ iff $[\![\mathit{luke}(x)]\!]^{x \mapsto \mathit{Luke}}_w = 1$ iff the actual Luke is, in w, named Luke. Crucially, this is a truly contingent proposition, as opposed to the representation of the descriptive, unanchored variant of (24), which is true (or undefined), in every world.

I have three objections against this analysis, the first of which is really an objection against direct reference as such: (i) being wholly referentialist, the anchoring account is 'too rigid' to account for the non-referential uses discovered by the descriptivists (cf. Bambi (12) and Aardvark (16)); (ii) in anchored representations the intuitive meaning associated with a proper name is lost completely, which is especially problematic in the case of indexicals, which obviously have such a meaning (as captured by its Kaplanian character, a notion absent from anchored DRT); (iii) the notion of an anchor is at odds with the representational architecture of DRT.

Let me elaborate on the last point. In Kamp's original DRT, and in the presuppositional extension we're working with here, DRSs form an intermediate representational level between the

sentence and the model theoretic interpretation. This level is not a merely a helpful notation, but an integral part of the interpretation process. First of all, this is due to Kamp's mentalistic philosophy (DRS representation as symbolic entities can, in a sense, fit in the mind), but, less philosophically, language interpretation, and presupposition resolution in particular, relies heavily on the manipulation of symbolic material in a DRS. It is unclear how anchors fit into this architecture, since an anchor consists of pairs of discourse referents and actual individuals from the domain, i.e. it is a mixture of symbolic and model theoretic entities, obviously unfit as a genuine part of a representation.

I propose to use Geurts and Maier's (2003) Layered DRT framework to represent names rigidly in DRSs, without mixing object- and metalanguage (cf. (iii)), instead retaining a representation of the descriptive meaning (cf. (ii)) within the DRS (at a separate layer). In the next section I will then address the first objection, (i), above by combining LDRT with presupposition theory.

3.2 Layered DRT

LDRT is a framework designed to model the interaction of distinct but not independent types of information contributed by an utterance. It introduces labels to store the information contained in a DRS at separate layers, which are connected by sharing discourse referents. The semantics relativizes the interpretation of an LDRS to a specific layer, in effect ignoring everything labeled otherwise. For our current purpose, we need two layers, one for the truth conditional contribution, labeled *fr*(egean), and one for the reference fixing content that comes from proper names, labeled *k*(ripkean). The syntax of this 2-layered fragment is like regular DRT except that every condition, atomic or complex, is marked with one of the two labels. If we assume that the content introduced by a proper name or other directly referential term is labeled *k*, while the rest is labeled *fr* we can already distinguish the representations for *Luke* in (4a) and *the person called Luke* in (4b), without anchors:

(25) a. Luke is called Luke
b. $\left[\mathtt{x} \middle| \mathtt{luke}_k(\mathtt{x}), \mathtt{luke}_{fr}(\mathtt{x})\right]$
c. The person called Luke is called Luke
d. $\left[\mathtt{x} \middle| \mathtt{luke}_{fr}(\mathtt{x}), \mathtt{luke}_{fr}(\mathtt{x})\right]$

But of course this is just symbols, we still need to set up the semantics in such a way that the *k* marked content gets separated from the propositional contribution and provide an actual individual. In fact, we'll turn the *k* content into an anchor that restricts the embeddings for the *fr* content in the Kampian way, but first we need the basic semantic notion of truth in a world with respect to a particular label:

(26) a. $[\![\varphi]\!]^f_{l,w} = 1$ iff there is an embedding $g \supseteq_{U(\varphi)} f$ with for all $\gamma_l \in Con(\varphi)$: $[\![\gamma_l]\!]^g_{l,w} = 1$
(i) [atomic] e.g. $\gamma_l = P_l(x,y)$: $[\![\gamma_l]\!]^g_{l,w} = 1$ iff $\langle g(x), g(y)\rangle \in [\![P]\!](w)$
(ii) [complex] e.g. $\gamma_l = \neg_l \psi$: $[\![\gamma_l]\!]^g_{l,w} = 1$ iff there is no $h \supseteq_{U(\varphi)} g$ with $[\![\psi]\!]^h_w = 1$

Now, we shouldn't evaluate the *k* material at the same possible world as *fr*, so we follow Kaplan and use contexts for the reference fixing stage. We assume here that evaluating a predicate at a context is exactly like evaluating it at a possible world except that the `speaker` predicate gets a singleton extension, as do all name predicates. This ensures that any plausible *k* part of an LDRS has (at most) one verifying embedding function in a context, whereas it generally has more when evaluating that same content at a world. Thus, we define *the* verifying embedding of the *k* layer of an LDRS at a context.

(27) $!\llbracket\varphi\rrbracket_{k,c}$ = the unique f for which $\llbracket\varphi\rrbracket^{f}_{k,c} = 1$ (undefined if there is no such f)

Then, to define the proper 2D notion of truth in a context, we simply use that context-based embedding as an anchor for the computation of the *fr* layer:

(28) $\llbracket\varphi\rrbracket^{c} = \left\llbracket\left\langle \varphi, !\llbracket\varphi\rrbracket_{k,c}\right\rangle\right\rrbracket$ = the set of w where φ has is a truthful embedding $f \supseteq !\llbracket\varphi\rrbracket_{k,c}$

Applying it to our examples, we can easily verify that this gives an adequate, rigid semantics of (referential) proper names. For the purely descriptive LDRS the context doesn't play any role for there is nothing in k: $\llbracket(25d)\rrbracket^{c} = \{w \mid$ there is someone called Luke in $w\}$. For (25b), we first evaluate the k layer at the context which gives us a unique verifier $!\llbracket(25b)\rrbracket_{k,c} = \mathtt{x}{\mapsto}\mathit{Luke}$ (= the person called Luke in c). Evaluating *fr* with respect to this verifier as anchor corresponds exactly to our earlier derivation of the anchored (24), which, as we saw there, has the right truth conditions. In conclusion, the LDRT analysis has addressed objections (ii) and (iii) by replacing the overt anchor with explicit descriptions at the DRS level. This is only preliminarily however, for we have not yet said how to derive these layered LDRS from a given surface structure.

3.3 Layered presuppositions

Now that we've switched to a 2D syntax and semantics for DRT the question becomes how to turn names, pronouns and descriptions into layered preliminary structures and how to resolve those. I'll consider two options: a lexical account that distinguishes two kinds of presuppositions, and a pragmatic account which leaves presuppositions underspecified with respect to their layer.

The lexical theory is based on Zimmermann's (1991) "Hypothesis (L): lexical items are always deictic or absolute." i.e. an expression's reference either depends only on the context (and is intensionally rigid), or it has intensional content but is contextually inert. In our LDRT terms, the content of an expression either wholly resides on k, or on *fr*, and which of the two is specified by the (L)exicon, and should thus be reflected in the preliminary LDRS. This means that there are two kinds of presupposition, k-presuppositions triggered by lexically rigid items, and *fr*-presuppositions triggered by definite descriptions and other, non-NP triggers. Our test sentences' PrelLDRSs thus look like this:

(29) a. Luke is called Luke
b. $\left[\left|\mathtt{luke}_{fr}(\mathtt{x}), \partial\left[\mathtt{x}\middle|\mathtt{luke}_{k}(\mathtt{x})\right]\right.\right]$
c. The person called Luke is called Luke
d. $\left[\left|\mathtt{luke}_{fr}(\mathtt{x}), \partial\left[\mathtt{x}\middle|\mathtt{luke}_{fr}(\mathtt{x})\right]\right.\right]$

As for layered resolution, we are tempted to introduce a "layer faithfulness constraint" to the effect that a layered presupposition must be resolved in its own layer, i.e. bound to a referent whose associated content semantically matches with respect to that layer, or to that layer by accommodation. This seems to make the right prediction for (29), because, when added to an empty context, (29b) would have to accommodate in k, which, presumably, is pretty hard (given the contextual givenness of k evaluation), while (29d) would accommodate in the descriptive *fr* layer, yielding the expected trivial LDRS in (25d). A more natural context for (29b) would be one that contains a contextually salient Luke represented in the k-layer. In such a context, (29b) will resolve to the contingent output (25b) with direct reference to Luke. In the same context LAYERFAITH currently blocks resolution of (29d) to the rigid output (25b), which may still conform to your intuitions, or, if not, allows a fix by bridging (i.e. adding the inference that the

fr-accommodated Luke is the same as the contextually given Luke). There are however other cases for where LAYERFAITH is clearly violated.

In particular, LAYERFAITH blocks the non-global resolutions needed to account for Bambi and Aardvark sentences. Consider Bambi first:

(30) If a child is christened Bambi and Disney Inc. find out about it, they will sue Bambi's parents

$$\left[\left|\left[\begin{array}{l|l}\mathtt{x} & \mathtt{child}_{fr}(\mathtt{x}), \mathtt{bambi}_{fr}(\mathtt{x}), \mathtt{find\_out}_{fr}(\mathtt{y}) \\ \partial\left[\mathtt{y}_k \middle| \mathtt{disney}_k(\mathtt{y})\right] & \end{array}\right] \Rightarrow \left[\begin{array}{l} \mathtt{sue\_parents\_of}_{fr}(\mathtt{y},\mathtt{z}) \\ \partial\left[\mathtt{z} \middle| \mathtt{bambi}_k(\mathtt{z})\right] \end{array}\right]\right]$$

Both definites (Disney and Bambi) are proper names and thus lexically specified as *k*. Intuitively we need to bind z (Bambi) to x (the hypothetical child called Bambi). In Geurts unlayered DRT this was possible because the two matched in content; here this won't work because with respect to *k*-interpretation they do not match (since nothing is predicated of x as far as *k* is concerned). It seems we have to allow "layer hopping" of the *k*-presupposition to get the desired output:

(31) $$\left[\mathtt{y} \middle| \mathtt{disney}_k(\mathtt{y})\ \left[\mathtt{x} \middle| \mathtt{child}_{fr}(\mathtt{x}), \mathtt{bambi}_{fr}(\mathtt{x}), \mathtt{find\_out}_{fr}(\mathtt{y})\right] \Rightarrow \left[\left| \mathtt{sue\_parents\_of}_{fr}(\mathtt{y},\mathtt{x})\right]\right]$$

The same applies to the Aardvark sentence where a name, lexically specified as triggering a *k*-presupposition, cannot possibly resolve in its own layer. To see what happens, consider the prelLDRS:

(32) If presidents were elected by alphabetical order, Aaron Aardvark might have been president

$$\left[\left|\left[\left|\mathtt{presidents\_alphabetical}_{fr}\right] \Rightarrow \left[\left|\Diamond_{fr}\left[\left|\mathtt{president}_{fr}(\mathtt{x}), \partial\left[\mathtt{x} \middle| \mathtt{a.aardvark}_k(\mathtt{x})\right]\right]\right]\right]\right]$$

Faithful resolution is impossible, because: (i) there is no *k*-information to bind to, (ii) global accommodation of *k*, if sound ever, yields an unintended reading about an actual Aaron Aardvark, and (iii) local, embedded *k*-layers simply don't make sense in the current formalization (as is appropriate given the fact that *k* corresponds to, in a sense, hyper-global information, i.e. information that is more global/contextual still than the global DRS context of vanilla DRT). The output we want is one where not the person but the name itself plays a role, which can only be achieved by accommodating the presupposition in *fr*:

(33) $$\left[\left|\left[\mathtt{x} \middle| \mathtt{presidents\_alphabetical}_{fr}, \mathtt{a.aardvark}_{fr}(\mathtt{x})\right] \Rightarrow \left[\left|\Diamond_{fr}\left[\left|\mathtt{president}_{fr}(\mathtt{x})\right]\right]\right]\right]$$

So, LAYERFAITH can be violated, but then why have it at all? First of all, I believe that layer hopping is exceptional and allowed only in special cases where interpretation would otherwise come to a halt. Also, if we were to say that a proper name is free to bind and accommodate in *k* as well as *fr*, we'd be giving up on Hypothesis L and end up with a descriptivist Geurtsian account where there is no more distinction between names and their descriptive counterparts. (Nonetheless I'll try to flesh out a proposal along these lines below.) Apart from these intuitions, there's a much stronger argument based on the behavior of indexicals, so we make a brief indexical excursion.

Presumably we will want to extend our analysis of names to indexicals, and we can: simply represent *I* as a *k*-presupposition *the speaker*. Now there are no contexts without a contextually given speaker, so it's safe to assume that every LDRS input context has a *k*-labeled speaker. This gives the following, correct, interpretation of the Kaplanian variant of the Kripke test:

(34) I am speaking [=(6a)]

$$\left[\mathtt{x}\middle|\mathtt{speaker}_k(\mathtt{x})\right]\oplus\left[\middle|\mathtt{speak}_{fr}(\mathtt{y}),\partial\left[\mathtt{y}\middle|\mathtt{speaker}_k(\mathtt{y})\right]\right]\rightsquigarrow\left[\mathtt{x}\middle|\mathtt{speaker}_k(\mathtt{x}),\mathtt{speak}_{fr}(\mathtt{x})\right]$$

Indexicals seem less eager to bind or accommodate in *fr* than proper names, let alone regular *fr*-presuppositions. It's easy to see that dropping LAYERFAITH for indexicals will generate many impossible readings. Take (35a): the consequent obviously says the actual speaker is nervous, not the student who's speaking, yet an unrestricted presuppositional account will generate the bound reading as shown in (35b):

(35) a. If a student$_i$ is speaking, I$_{*i}$ am nervous

b. $$\left[\mathtt{x}\middle|\mathtt{speaker}_k(\mathtt{x})\right]\oplus\left[\middle|\left[\mathtt{y}\middle|\begin{array}{l}\mathtt{student}_{fr}(\mathtt{y})\\ \mathtt{speak}_{fr}(\mathtt{y})\end{array}\right]\Rightarrow\left[\middle|\begin{array}{l}\mathtt{nervous}_{fr}(\mathtt{z})\\ \partial\left[\mathtt{z}\middle|\mathtt{speaker}_k(\mathtt{z})\right]\end{array}\right]\right]\rightsquigarrow$$
$$\rightsquigarrow \mathtt{z}\mapsto\mathtt{y}\rightsquigarrow\left[\mathtt{x}\middle|\mathtt{speaker}_k(\mathtt{x})\ \left[\mathtt{y}\middle|\mathtt{student}_{fr}(\mathtt{y})\right]\Rightarrow\left[\middle|\mathtt{nervous}_{fr}(\mathtt{y})\right]\right]$$

Since the antecedent's hypothetical speaker is closer to the presupposition in the projection path, we even predict that this should be the preferred reading, even though, in principle we can also derive the intended reading through global resolution. If on, the other hand we introduce LAYERFAITH, the intermediate option is blocked and we get only the correct, global *k* resolution. More has to be said about indexicals, for there are apparent cases of indexical shifting, which, interestingly, can be accounted for without layer hopping. I leave this for another occasion and instead consider analogous examples with proper names. There the interpretations can go either way, compare for instance (36) with the Bambi example. Where *Bambi* was bound, this *Gerontius* is easily read as referring to the actual Gerontius, who is proud of his name and doesn't want to share (or trade?) it with his friend:

(36) Horace$_i$ and Gerontius$_j$ are friends. If Horace had been named Gerontius, Gerontius$_{j/?i}$ would be irked.

Conclusion: Zimmermann's Hypothesis L and the indexical data supportwe hold on to the layer faithfulness constraint, but note that, at least for names, it may occasionally be overruled under pragmatic pressure (Bambi, Aardvark). In the next section we investigate what happens if we drop Hypothesis L.

3.4 A pragmatic alternative?

If we simply focus on the proper name data (i.e. the Kripke test, Bambi, and Aardvark) it seems that we have paid a rather high price for maintaining a rigid lexical distinction (viz. the Bambi and Aardvark cases as violations of the constraint). What if we drop the labeling of unresolved presuppositions? As pointed out above, this easily leads to 1-dimensional descriptivism so we need something more to regulate correctly layered outputs. Instead of a lexical layer assignment at the level of PrelDRS construction, I now propose a more pragmatic layer assignment mechanism integrated in the resolution process.

The main idea is that names trigger simple, unlabeled presuppositions, which look through the various layers of the DRS for a suitable antecedent. Apart from the usual pragmatic and semantic constraints on presupposition resolution (van der Sandt 1992) we should add some pertaining to layer selection. We need to establish a proper order in which the layers are searched for matching antecedents, i.e. a refinement of the preferential order we already have, going from local binding, through global accommodation, to local accommodation.

In order to discuss the implications more effectively, I'll formulate the envisaged resolution preferences in terms of an Optimality Theoretic constraint ranking. I'll focus on the semantic

constraints, i.e. the ones having to do with the accessibility path, not the pragmatic ones having to do with coherence and informativity:

(37) $*$ACCOMMODATE $>$ $*k$-ACCOMMODATE $>$ $*$ACCOMMODATELOCAL $>$ $\{*$BINDGLOBAL, $*fr$-BIND$\}$

Let's examine this ranking a little closer. First is the familiar constraint favoring binding over accommodation[8]. Then we get a layer constraint: don't accommodate in *k*. Along the way, I've already provided the arguments for this: (i) local *k* layers do not make sense conceptually, and, in the current system, are not even interpretable; and (ii) global accommodation is rather dubious, for if an individual is available in the extra-linguistic context *c*, it will presumably be represented at the representational input level, available for binding, and if it isn't, we can't very well accommodate an extra-linguistic contextual entity. The third constraint encodes the well-known idea that accommodation has to take place as high up in the DRS as possible. The opposite is true for binding, which prefers local antecedents, hence our fifth constraint against global binding.

So far, the system makes the right predictions for Bambi (binding to *fr* antecedent), and for the Kripke test sentences, which both allow binding to contextually given antecedent in *k* when present (though in such a case, using the proper name variant is highly preferred, cf. discussion of (29)). However, in light of our observation that (36) admits two readings, I've tentatively introduced a final constraint against descriptive binding, ranked equal to $*$BINDGLOBAL. Let's see why:

(38) [Horace and Gerontius are friends.] If Horace had been named Gerontius, Gerontius would be irked. [=(36)]

$$\left[\begin{array}{l}\mathtt{x\ y}\\ \hline \mathtt{horace}_k(\mathtt{x}), \mathtt{gerontius}_k(\mathtt{y})\\ \mathtt{friends}_{fr}(\mathtt{x},\mathtt{y})\end{array}\right] \oplus \left[\left[\left[\begin{array}{l}\\ \hline \mathtt{gerontius}_{fr}(\mathtt{z})\\ \partial\left[\mathtt{z}\middle|\mathtt{horace}(\mathtt{z})\right]\end{array}\right] \Rightarrow \left[\begin{array}{l}\\ \hline \mathtt{irked}_{fr}(\mathtt{w})\\ \partial\left[\mathtt{w}\middle|\mathtt{gerontius}(\mathtt{w})\right]\end{array}\right]\right]$$

$$\rightsquigarrow \mathtt{z}\mapsto\mathtt{x} \rightsquigarrow \left[\begin{array}{l}\mathtt{x\ y}\\ \hline \mathtt{horace}_k(\mathtt{x}), \mathtt{gerontius}_k(\mathtt{y}), \mathtt{friends}_{fr}(\mathtt{x},\mathtt{y})\\ \left[\mathtt{gerontius}_{fr}(\mathtt{x})\right] \Rightarrow \left[\begin{array}{l}\\ \hline \mathtt{irked}_{fr}(\mathtt{w})\\ \partial\left[\mathtt{w}\middle|\mathtt{gerontius}(\mathtt{w})\right]\end{array}\right]\end{array}\right]$$

(i) $\rightsquigarrow \mathtt{w}\mapsto\mathtt{x} \rightsquigarrow \ldots$

(ii) $\rightsquigarrow \mathtt{w}\mapsto\mathtt{y} \rightsquigarrow \ldots$

Option (i) is local, Bambi-like binding into the *fr* layer, and it gives the output, suboptimal in this particular context, where the hypothetical name change affects the interpretation of the name in the consequens. Option (ii), global, *k*-binding, is the reading where Gerontius is the one who's annoyed about the name change. Without a sixth constraint this last reading would be out, while with $*fr$-BIND $>$ $*$BINDGLOBAL, we'd block (i). More intuitions about similar cases (with names and other definites[9]) are required.

So far the pragmatic layers version seem quite promising, for names if not for indexicals: in addition to Bambi, Aardvark (prediction: local accommodation in *fr* since all binding and global resolutions in whatever layer are suboptimal) and Luke sentences, it also appears to account for the ambiguity in (38). Moreover, it does not rely on the extra assumption of Hypothesis L and gives an even more unified account of definites, without falling into pure Geurtsian descriptivism on account of our layered outputs. But is this really true? We can have layered,

[8]Perhaps, this constraint is not universal for all presuppositions, but for (short) definites at least I think it's pretty well-established. Note that the optimal output may still be overridden by higher ranked pragmatic constraints.

[9]I'd expect definite descriptions to pick up descriptive material quite easily.

semantically rigid reference in our outputs, but only if those rigid entities were already represented in the input, and in that case, we predict we can bind to them with names as well as with descriptive triggers. In other words, since we do not distinguish the presupposition triggered by a name from the one triggered by its definite descriptive counterpart, we will not do justice to the contrast in the Kripke test. The dynamic meanings (context change potentials, preliminary LDRSs) are the same for *Luke* and *the person called Luke*: $\partial\left[\mathtt{x}\middle|\mathtt{luke}(\mathtt{x})\right]$. I conclude that the lexical alternative beats the pragmatic, underspecified one, which in the end, turns out to be only a minor amendment to Geurts's (1997) proposal, failing to fix its fatal flaws despite the layered semantics.

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