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Mental Files and Non-Transitive De Jure Coreference

Filipe Drapeau Vieira Contim
(U. Rennes 1, EA 1270)

Abstract Among other virtues, Mental Files Theory provides a straightforward explanation of de jure coreference, i.e. identity of referent guaranteed by meaning alone: de jure coreference holds between terms when these are associated with the same mental file from which they inherit their reference. In this paper, I discuss an objection that Angel Pinillos raises against Mental Files Theory and other similar theories: the theory predicts that de jure coreference should be transitive, just like identity. Yet there are cases, involving 'slash-terms', in which transitivity fails, or so it seems. In his book *Mental Files*, Recanati replies that the mental files theorist can accommodate Pinillos' exceptions by offering a refined model of merging files, the 'partial merging' model. While agreeing with Recanati on the need for such a model, I contend that, *pace* Recanati and Pinillos, de jure coreference is transitive even in the presence of slash-terms. I will first show that paradoxical consequences ensue if slash-terms are said to de jure corefer with several basic terms at once. Then, building on two different accounts Recanati gives of referential confusion, I will show that on both views, de jure coreference cannot hold because of the behaviour of confused slash-terms. I will conclude that, in Mental Files Theory, a slash-term can, at most, de jure corefer with only one basic term per context.

Keywords Mental Files – De Jure Coreference – Referential Confusion – Identity – Reference

1 Introduction

Among other virtues, Mental Files Theory provides a straightforward explanation of de jure coreference, i.e. identity of referent guaranteed by meaning alone: de jure coreference holds between terms when these are associated with the same mental file from which they inherit their reference. In this paper, I present (§2) and discuss an objection that Angel Pinillos raises against all Fregean accounts of de jure coreference, including Mental Files Theory: if the theory were true, de jure coreference should be transitive, just like identity. Yet, there are cases, involving what Pinillos calls 'slash-terms', in which transitivity fails, or so it seems. In his book *Mental Files*, François Recanati replies that the mental files theorist can accommodate Pinillos' exceptions by offering a refined model of merging files, the 'partial merging' model (§3). While agreeing with Recanati on the need for such a model for slash-terms, I contend that, *pace* Recanati and Pinillos, de jure coreference is transitive even in the presence of slash-terms. I will first show (§4) that paradoxical consequences ensue if slash-terms are said to de jure corefer with several basic terms at once. Then, building on two different accounts Recanati gives of confused files, the presupposition view (§5) and the dominance view (§6), I will show that both views lead to the same result: de jure coreference cannot hold in such cases because of the behaviour of slash-terms in cases of referential

confusion. I will conclude that, in Mental Files Theory, a slash-term can, at most, de jure corefer with only one basic term per context.

2 The Transitivity Objection against Mental Files Theory

'Mental files' and akin terms have been coined by philosophers of language and mind to explain various semantic and cognitive data, the main type of which being de jure coreference. Two terms t and t' are said to *de jure* corefer with each other if and only if (i) t and t' refer to the same thing, (ii) it is a semantic fact, guaranteed by meaning alone, that they refer to the same thing if they refer at all (Fine 2009). Assuming that meaning is transparent, it means that a competent user of t and t' knows that these terms corefer if they refer at all. Conversely, anyone who wonders whether their reference is the same thereby betrays his lack of understanding of what the speaker means (Fine 2009). Referential links between anaphoric pronouns and their antecedents, and those between multiple occurrences of the same name[1], provide paradigmatic cases of de jure coreference.

In the mental files framework, de jure coreference receives a straightforward explanation: Mental files are postulated as mental correlates of referential terms, whose function is to gain, store and integrate information coming from a (presumed) unique source with which one is acquainted through various information channels (perception, proprioception, communication by names, etc.). That t de jure corefers with t' is then explained by the fact that these terms are associated with the same mental file from which they inherit their reference. In few words: de jure coreference rests on *identity* of files.

However, in his book *Mental Files* (Recanati 2012), the most thorough attempt to systematize the mental files approach, François Recanati admits exceptions: de jure coreference may hold even when terms are associated with *distinct* files. This concession is needed to account for counterexamples put forward by Angel Pinillos (2009, 2011):

(1) It turns out that Hesperus_1 is Phosphorus_2. Let's call $\text{it}_{1,2}$ ($\text{this planet}_{1,2}$)'Venus'.

(2) Hesperus_1 is Phosphorus_2 after all, so $\text{Hesperus/Phosphorus}_{1,2}$ (Hesperus alias $\text{Phosphorus}_{1,2}$) is visible both in the evening and in the morning.

Following Pinillos, I use co-indexing to indicate occurrences uttered with the intention to corefer. Likewise, for convenience I will refer to doubly indexed terms as 'slash-terms', and

[1] Here and in the following, by 'multiple occurrences of the same name' I mean occurrences uttered with a coreferential intention, when not specified otherwise. This restriction is needed to take into account 'Paderewski' cases in which a speaker utters two tokens of the same name while wrongly believing that they refer to different objects sharing homonymous names.

to singly indexed ones as 'basic terms'[2]. Two caveats are in order before proceeding. First, talk of slash-terms does not presuppose that these would de jure corefer with basic terms; the terminology used here is meant to be neutral with respect to this disputed issue. As I hope to show soon, coreferential intentions may indeed not result in de jure coreference, even when terms happen to corefer. So co-indexing indicates at most *putative* de jure coreference. Second, although slash-terms are so called in reference to compound names such as 'Hesperus/Phosphorus', some are simple expressions like the anaphoric pronoun 'it' in statement (1). There will be, therefore, slash-pronouns as well as slash-names. More surprisingly, even some slash-names are not complex expressions. Consider (1) again. The discoverer of the identity of Hesperus and Phosphorus coins a new name, 'Venus', in order to refer to what she takes to be the same planet named twice. She fixes its reference by using a slash-pronoun, 'it' (or 'this planet'), with the intention to corefer with both 'Hesperus' and 'Phosphorus'. 'Venus', as used by the stipulator of the name, will then presumably de jure corefer with 'it' – the stipulator cannot sensibly ask herself 'Is $it_{1,2}$ really Venus?' just after the baptism. Since 'it' is intended to corefer with both 'Hesperus' and 'Phosphorus', it follows that 'Venus', as used by the stipulator, will putatively de jure corefer with both basic names. Some occurrences of simple names may thus behave like occurrences of explicit slash-names[3].

This being said, let us turn now to Pinillos' objection. Pinillos argues that examples such as (1) and (2) show that de jure coreference is *not* transitive. Indeed, a speaker who understands (2) knows thereby that 'Hesperus/Phosphorus' corefers with 'Hesperus' if these terms refer at all. This is evidence that the slash-name de jure corefers with the basic name. The same holds with the coreference between the slash-name and 'Phosphorus'. Still, one can fully understand (2) while doubting that 'Hesperus' and 'Phosphorus' refer to the same planet; it would betray empirical ignorance, not misunderstanding. This shows that even if 'Hesperus' and

[2] Pinillos and Recanati make use of 'slash-terms' while 'basic terms' is mine.

[3] For another example of an ordinary name functioning as a slash-term, see also the following one given in (Pinillos 2011): "As a matter of fact, my neighbour $John_1$ is Professor $Smith_2$, you will get to meet (the real) $John\ Smith_{1,2}$ tonight". This may dispel doubts about the existence of slash-names. As an anonymous referee points out, one might indeed question that composite expressions such as 'Hesperus/Phosphorus' or 'Hesperus-alias-Phosphorus' are genuine names or even singular terms to which reference and related notions (e.g. de jure coreference) can be meaningfully applied. It could be argued, for instance, that 'Hesperus/Phosphorus' abbreviates the phrase 'Hesperus, which is identical to Phosphorus', or that, in accordance with the etymology of 'alias', 'Hesperus-alias-Phosphorus' is a shortcut standing for the metalinguistic claim 'Hesperus, which is also known as 'Phosphorus''. Note however that the fact that these expressions have names as components is by no means an argument against their being names, since this is true also of capitalized definite descriptions like 'The Eiffel Tower' that function as *bona fide* names. For the sake of the discussion, I will follow Pinillos and Recanati and treat such expressions as singular terms. For those who have qualms about compound slash-names, these can be replaced in all my examples by simple slash-names or slash-pronouns without affecting the discussion.

'Phosphorus' refer to the same planet, they corefer *only* de facto, not de jure. So, de jure coreference fails to be transitive: the slash-name de jure corefers with both basic names whereas the latter only de facto corefer with each other.

Pinillos makes of the transitivity failure the starting point of a knock-down argument directed against all Fregean accounts of de jure coreference, including Mental Files Theory. For the files theorist, the objection proceeds thus: if de jure coreference rests on identity of files, then it should be transitive since identity is a transitive relation; yet we have just seen that de jure coreference fails to be transitive in the presence of slash-terms. Conclusion: de jure coreference cannot be explained by sameness of files; we must give up Mental Files Theory, at least as an account of de jure coreference.

3 Slash-terms and Partial Merging

In chapter 9 of *Mental Files*, Recanati concedes to Pinillos that de jure coreference may fail to be transitive. Recanati contends, however, that this does not threaten Mental Files Theory as the theory has the resources to accommodate Pinillos'exceptions.

Recanati asks us to distinguish between two kinds of cases. In standard cases, e.g. multiple occurrences of the same name, de jure coreference rests on identity of files. It is then transitive, just like identity. Yet, Recanati argues that de jure coreference can be grounded in some relation other than identity of files, specifically when in the presence of slash-terms. In such cases, de jure coreference is grounded on the *inclusion* relation that obtains between each of the files associated with the basitoc terms and what Recanati calls the 'inclusive file' associated with the slash-term. The particularity of the inclusion relation explains then why transitivity fails.

To illustrate this, let us go back to Pinillos' examples. A subject who understands the names 'Hesperus' and 'Phosphorus' in (1) and (2) deploys two different files, one for each name. As the files are utterly disjoint – they are not identical nor is one included in the other – an identity judgment is needed in order to represent that the names have the same referent. The cognitive effect of accepting an identity is what Recanati calls 'linking' between files (Recanati 1993, 2012). When two files are linked, information can flow freely from one file to another. The cognitive process of identification may stop there, but in many cases, it goes beyond mere linking. A third file is then created into which one feeds all the information stored in the two initial files. At first, this 'inclusive file', as Recanati calls it, does not suppress the initial files: all files coexist in a situation of *partial merging* (Recanati 2012; see also Lawlor 2001). This is where slash-terms come in: "It is, I take it, the function of slash-terms such as 'Hesperus/Phosphorus' to be associated with inclusive files in situations of

partial merging"[4] (Recanati 2012). Finally, when the identification becomes routine, it results in *complete merging*: the two initial files are suppressed and only the fusion file is kept. As I interpret Recanati's apparatus, perhaps beyond the intention of the author, linking, partial merging and complete merging are three successive stages of any cognitive identification process brought to fruition[5]. Insofar as slash-terms are involved in partial merging, their use is anything but marginal: it is a pervasive, though ephemeral, phenomenon that deserves more attention than it usually receives.

It seems then that Recanati's merging model can easily account for non-transitive de jure coreference: 'Hesperus/Phosphorus' de jure corefers with both basic names in spite of the difference of files, because the slash-name has its reference fixed by a composite file that includes each basic name's file. The inclusion relation between files guarantees that if the slash-name inherits a referent from the inclusive file, it will refer to whatever referent the basic names inherit from their respective files. So Pinillos' objection is dismissed: it shows, at most, that identity of files is a sufficient but *not necessary* condition of de jure coreference, since the latter can also be realized by files in inclusion relation[6]. Either way, the fact remains that it is the nature of files that explains de jure coreference. Mental Files Theory is safe.

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[4] That does not mean, however, that names of the form 'N1/N2' or 'N1 alias N2' are used only in situations of partial merging. I can sensibly say "Giorgione alias Barbarelli painted *The Tempest*" while my uses of 'Giorgione' de jure corefer with my uses of 'Barbarelli' by being associated with a single file of the famous painter. This is precisely what is expected with nicknames such as 'Giorgione'.

[5] Actually, Recanati (personal communication) does not exclude that partial merging may sometimes constitute the final stage of an entrenched identification. Notice that complete merging does not necessarily lead to simplifying the naming practice: one may still use both 'Emile Ajar' and 'Romain Gary' even though occurrences of both names now have their reference fixed by a single fusion file of the French novelist (more than 30 years have passed since the revelation of the identity of Ajar alias Gary). Likewise, complete merging does not result in strict synonymy – 'Gary' evokes *The Roots of Heaven* whereas 'Ajar' does not. It only guarantees that the two names have the same referent (if there is one).

[6] One may challenge the explanatory value of the partial merging model by arguing that non-transitive de jure coreference may occur without any merging, specifically in attitude reports. Consider for instance: "Hammurabi believes that Hesperus is Phosphorus, and thus that it is visible both in the evening and in the morning". Suppose that, in the conversational context, all participants (falsely) presuppose that Hesperus and Phosphorus are two distinct planets. There is then no linking, nor a fortiori merging of any sort; the speaker and the audience fully understand the statement while accessing two insulated files, one for each name. Still, the pronoun 'it' seems to de jure corefer with both 'Hesperus' and 'Phosphorus'. In support of Recanati's model, I will argue that, appearances notwithstanding, such examples do not involve de jure coreference. As the speaker takes for granted that there is no such thing as Hesperus-alias-Phosphorus, she indeed presupposes that the pronoun does not refer at all (on the emptiness of confused terms, see the next section). But then she cannot use a term she believes to be referentially empty in order to corefer with what she takes as two referential names. Hence, there is no de jure coreference here, for there is not even intended coreference. The false impression of de jure coreference stems from the fact that 'it' is used to *represent* (putative) de jure coreference within the reported thought as opposed to *express* de jure coreference in the ascriber's thought, on a par with 'she' in: "Hammurabi believes that he met a

I find Recanati's framework illuminating, and I readily endorse most of it, including the partial merging model. However, I think Recanati concedes too much to Pinillos by allowing for a transitivity failure of de jure coreference. I will defend here the orthodox Fregean view on which de jure coreference rests on identity of files and thus verifies transitivity. I will proceed first by showing that paradoxical consequences ensue if slash-terms are said to de jure corefer with basic terms. Building on Recanati's machinery, I will then explain why slash-terms can at most de facto corefer with basic terms. If I am right, Pinillos' objection is a non-starter: transitivity of de jure coreference admits of no exception, even in the presence of slash-terms.

4. A Paradox

Let's begin with a paradox. To get it, one only has to exploit an inference rule that is constitutive of de jure coreference. The rule says that if a term t' de jure corefers with a term t, the *immediate* inference from 'Φ(t)' to 'Φ(t')' – where 'Φ(t')' results from the substitution of an occurrence of t by an occurrence of t' – is valid[7]:

Φ(t)

Φ(t')

By specifying that the inference is immediate or direct, I want to stress that no identity premise is needed for the inference to be valid: the very meaning of t and t' guarantees that t and t' corefer if they refer at all. Conversely, if validity requires the mediation of an identity premise, or any other factual premise, it is evidence that the terms corefer at most de facto with each other, as in the following inference:

Hesperus is visible in the evening sky,
Hesperus = Phosphorus,

∴ Phosphorus is visible in the evening sky.

witch and that she cast a spell on him". More specifically, the speaker describes Hammurabi as being in a situation of partial merging without being herself in such a state. That is made possible because one can represent a file (here the fusion file represented by 'it') without sharing it. Cases like this would need, however, to go deeper into the description of the subtle interplay between the ascriber's files and the ascribee's. On the metarepresentational function of files in attitude reports, see the detailed analysis given in chapters 9 and 14 of (Recanati 2012).

[7] Here and after, 'valid' means 'valid a priori'. In this sense, a valid inference is recognized as such by any competent and reflective speaker.

The fact that the transition from the 'Hesperus' premise to the 'Phosphorus' conclusion depends on an identity premise linking both names – its being *identity-dependent* for short – reveals that 'Phosphorus' only de facto corefers with 'Hesperus'.

Now, suppose that, following Pinillos and Recanati, we say that a slash-term 'a/b', e.g. 'Hesperus/Phosphorus', de jure corefers with two basic terms 'a' and 'b', e.g. 'Hesperus' and 'Phosphorus'. We then obtain two instantiations of the above rule, respectively, the *slash-introduction* rule and the *slash-elimination* rule[8]:

(Slash-I):	$\Phi(a)$		(Slash-E):	$\Phi(a/b)$
	---			---
	$\Phi(a/b)$			$\Phi(a)$

The problem is that such inferences, if valid, would lead to the unacceptable consequence that all identities are transparent, that is, knowable a priori by the following reasoning:

(i)	$a = a$	(reflexivity =)
(ii)	$a = a/b$	(i) × (Slash-I)
(iii)	$b = b$	(reflexivity =)
(iv)	$a/b = b$	(iii) × (Slash-I)

$\therefore$	$a = b$	(ii) × (iv) × (transitivity =)

The conclusion should be known a priori as it follows from premises and inferences that are presumed to be true or valid a priori. It will certainly be objected that self-identity premises cannot be known a priori since identity requires existence and concrete objects are known to exist only empirically. But this will not remove the difficulty. Even if we add the premises that a and b exist, we still obtain the unacceptable conclusion that, just by understanding 'a', 'b' and 'a/b', a speaker can know that a = b *if* a and b exist. Put in the formal mode: just by introducing 'a/b' into the language, one could know that 'a' and 'b' corefer with each other if 'a' and 'b' refer at all.

The same kind of paradoxical conclusion can be drawn by combining (Slash-I) with Existential Generalization (EG), without need of transitivity of identity:

(i)	$Fa \wedge Pb$	
(ii)	$Fa/b \wedge Pa/b$	(i) × (Slash-I)

$\therefore$	$(\exists x)(Fx \wedge Px)$	(ii) × (EG)

[8] 'a/b' stands for any slash-term, whether composite (e.g. 'Hesperus/Phosphorus') or not (e. g. 'it', 'this' or 'Venus' as used above).

In other words: a competent user of the slash-term ‘a/b’ is in a position to know thereby that ‘Fa’ and ‘Pb’ attribute properties to the same object, something that would normally require fastidious empirical investigation – think about how difficult it was to discover the identity of Hesperus and Phosphorus[9].

One could object that there is no real paradox here since from the fact that ‘a/b’ de jure corefers with ‘a’ and ‘b’, it simply does not follow that a user of ‘a/b’ could know that ‘a’ corefers with ‘b’ if ‘a’ and ‘b’ refer at all. What she knows, instead, is that ‘a’ corefers with ‘b’ if ‘a’, ‘b’ *and ‘a/b’* refer at all. However, the crucial piece of information that ‘a/b’ has a referent – in the material mode, the existence of a/b – is not something that one could know a priori just by grasping ‘a/b’. To know that, one has to know not only that a and b exist, but also that a = b[10], which requires empirical investigation in cases like that of Hesperus-Phosphorus. So, the most we can say here is that the user of the slash-term can know that ‘a’ corefers with ‘b’ if she has the previous empirical knowledge that a/b exists (besides knowing that a and b exist). The paradox appears then as a mere sleight of hand: in order to conclude that a = b in the first formulation of the paradox, we need the additional premise that a/b exists, which in turn requires that a = b is already assumed. The conclusion merely elicits what has been covertly endorsed in the premises.

I agree that here lies the fallacy responsible for the paradox but, precisely, the fact that the conclusion follows only if ‘a/b exists’ is added as a premise reveals that ‘a/b’ does not de jure corefer with ‘a’ and ‘b’. Let us still concentrate on the first formulation of the paradox. The reasoning is enthymematic, agreed, so let us find out which inferential steps require ‘a/b exists’ as an additional assumption. I see only two of them: the transition from (i) to (ii) and the transition from (iii) to (iv). Once properly completed, the former becomes thus:

(0) a exists,	(implicit premise)
(i) a = a,	(0) × (reflexivity =)
(i)’ a/b exists,	(assumption)
(ii) a = (a/b).	(i) × (i’) × (Slash-I)

This is rather disappointing: if ‘a/b’ truly de jure coreferred with ‘a’, we would not need to assume in (i’) that a/b exists in order to infer (ii) from (i). In virtue of the Slash-I rule, the transition from (i) to (ii) should be *direct*; we should have posited the existence of a/b by the very fact that we posited the existence of a. De jure coreference indeed makes such an

[9] The paradox is reminiscent of that of a priori contingent statements involving descriptive names (Kripke 1980; Evans 1979). Suppose Leverrier fixes the reference of the name ‘Neptune’ by means of the definite description ‘The planet, whatever it is, that causes perturbations in Uranus’ orbit’. Then it seems that, just by stipulating the name, Leverrier is now in a position to know a priori and effortlessly that Neptune deflects Uranus, a contingent fact that is normally known only through tedious astronomical observations.

[10] On the fact that a/b exists only if a = b, see the next section.

assumption superfluous: if t_2 de jure corefers with t_1, we know thereby that if t_1 has a referent, t_2 has a referent too, which is the same as t_1's; there is no room for a gap between the existence of t_1's referent and that of t_2's. On the other hand, if, as I believe, we claim that the existence of a/b must be posited in addition to that of a, then this shows that a *direct* transition from Φ(a) to Φ(a/b) is not valid. In other words, Slash-I inferences are not valid, which means that 'a/b' does not de jure corefer with 'a'. Moreover, suppose that we maintain that although 'a/b' de jure corefers with 'a', it is still necessary to posit first the existence of a/b in order to validly replace 'a' by 'a/b' in a statement:

Φ(a)
a/b exists

Φ(a/b)

If exploiting de jure coreference across reasoning required such an intermediary, it would lead to an infinite regress. After all, it is assumed here that the occurrence u' of 'a/b' in the conclusion de jure corefers with its occurrence u in the second premise. So, following the above requirement, we should posit first the existence of a referent for u' in order to use u' to corefer with u. But this in turn would lead to introducing a further premise involving a third occurrence u'' of 'a/b' and so on *ad infinitum*.

It should now be clear that slash-terms do not relate to basic terms in the way they would if there were de jure coreference. We got into paradox because of Slash-I inferences: we wrongly assumed that Φ(a/b) follows directly from Φ(a) as would be expected of terms linked by de jure coreference. Yet we have seen that such substitutions require the mediation of a further premise, either that a/b exists or, equivalently, that a = b. From this, I conclude that slash-terms do not de jure corefer with basic terms. There is at most de facto coreference in such cases.

The second lesson of the paradox is that de jure coreference *is* transitive. Consider the test that Pinillos and Recanati use to diagnose de jure coreference:

> *Knowledge Test*: to test if coreferential occurrences 'a' and 'b' exhibit de jure coreference, check to see if this is true: anyone who fully grasps 'a' and 'b' thereby knows that if 'a' and 'b' refer at all, then they refer to the same thing. If the answer is 'yes', then this is evidence that there is de jure coreference. If not, then this is evidence that there is only de facto coreference[11].

If accepted, the conclusion of the paradox would mean recognising that 'a' and 'b' pass Pinillos' test: *if* we assume that 'a/b' de jure corefers with 'a' and 'b', and with it the

[11] I borrow the formulation of the test from an unpublished manuscript of Pinillos: "De jure coreference and transitivity" (2009).

corresponding validity of Slash-I inferences, then a competent speaker can know that a = b through trivial inferences from the premises that a and b exist and are self-identical. Put into the formal mode, the speaker has knowledge of conditional coreference: she knows that 'a' corefers with 'b' if 'a' and 'b' refer. By the knowledge test, this is evidence that the basic terms de jure corefer with each other when the slash-term de jure corefers with both; de jure coreference proves to be transitive by Pinillos and Recanati's own criterion. Of course, to escape the paradox, transitivity should rather be used the other way around, in a modus tollens: since 'a' and 'b' only de facto corefer with each other, so, by transitivity of de jure coreference, the slash-term cannot de jure corefer with *both* basic terms at once[12]. But then, the transitivity of de jure coreference leads Recanati to a dilemma:

Either Recanati could escape the paradox by making the modus tollens inference. On the first horn of the dilemma, Pinillos' objection is dismissed but the partial merging model loses much of its appeal for it can not longer be held that the inclusion relation between files realizes de jure coreference: 'Hesperus/Phosphorus' corefers only de facto with at least one (if not both) of the basic names although the corresponding files are connected by the inclusion relation. The upshot is that identity of files is not only sufficient but also *necessary* for de jure coreference to obtain.

Or Recanati could endorse the conclusion of the paradox, by making a modus ponens: since 'a/b' de jure corefers with 'a' and 'b', then, 'a' de jure corefers with 'b' after all. Let it be conceded provisionally that there is some way to argue that the apriority of 'a = b' is not as paradoxical as it appeared at first glance[13]. Still, this move will make the partial merging model *useless* –this is the second horn of the dilemma. Indeed, as soon as the name 'Hesperus/Phosphorus' is introduced, the basic names de jure corefer with each other, and therefore can no longer have their reference fixed by the initial files: these preclude de jure coreference as they are utterly disjoint – they are neither identical nor is one included in the other. So the mental files theorist has no other choice here but to say that initial files are no longer operative: the basic names as well as the slash-name have all their reference fixed by the same inclusive file obtained by merging the initial files. But, if so, this brings us back to a dualistic 'linking vs. merging' model. Either the identification process stops at mere linking; then no slash-term is introduced and the basic terms keep having their reference fixed by their

[12] Notice, however, that this is compatible with the slash-name de jure coreferring with *only one* of the basic terms. For a defence of such a view, see section 6 more below.

[13] One way to dispel the odour of paradox surrounding the apriority of 'Hesperus = Phosphorus' would be to say that basic names switch their sense once the slash-term is introduced. What is paradoxical, indeed, is that the user of 'Hesperus/Phosphorus' could know that Hesperus = Phosphorus while the basic names retain the sense they had *before* introducing the slash-name, as if a stroke of the pen could exempt her from the burdensome empirical investigation normally required to know such identity. The difficulty vanishes if we say that introducing a slash-term converts the basic names into mere synonyms, or rather, cognitive equivalents, of the former. However, this raises insuperable problems for the partial merging model defended by Recanati. See more below and the next footnote for drawbacks of such a strategy.

respective files in spite of the linking operation. Or the process goes on up to merging: a slash-term is introduced in anticipation of a new name (e.g. 'Venus'), initial files are suppressed and all the terms, basic names included, refer through the same fusion file, becoming thus cognitively equivalent[14]. There is then no room for an intermediary stage in which linking would co-exist with merging.

Either way, the paradox shows that when 'a' and 'b' retain their meaning according to which 'a = b' is both empirical and informative, there is no valid (immediate) substitution between slash-terms and basic terms, and thus that there is no de jure coreference between them. Yet, saying this is not enough, we also need to explain *why* de jure coreference fails in such cases. In particular, we have to explain why Slash-I inferences are not valid. In the following, I argue that de jure coreference does not hold because of *referential confusion*. The behaviour of slash-terms in cases of referential confusion reveals that there is no guaranteed coreference between slash-terms and basic terms.

5 Slash-terms under Confusion[15]

Let us go back to Pinillos' examples. At first sight, they seem convincing for the slash-terms occur in contexts of successful identification. As it turns out that Hesperus is, indeed, Phosphorus, the slash-name in (2) and the slash-pronoun in (1) corefer with both basic names. What happens, however, in cases of misidentification? Remember the famous example of Madagascar discussed in (Evans 1973). When Portuguese sailors discovered the island in 1500, they named it at first 'Sao Lourenço'. As they had heard also of a place named 'Madagascar', they believed that Sao Lourenço was Madagascar. But they were wrong. At that time, the name 'Madagascar' was used by African natives in order to designate a portion of the East African coast. Suppose now Diogo Dias, the famous Portuguese sailor, said:

(3) Sao Lourenço$_1$ is Madagascar$_2$. So, Sao Lourenço/Madagascar$_{1,2}$ (it$_{1,2}$) is the unique island facing the East African coast.

The slash-name, or equivalently the anaphoric pronoun 'it', is referentially confused: Diogo intends to refer to a unique object whereas there are two candidates for being the referent, the

[14] Notice that in that case, the sense of the name 'Hesperus' (or 'Phosphorus') changes once the slash-term has been introduced. If, following Recanati, we equate the 'mode of presentation' or the 'Fregean sense' expressed by a referential term with its associated mental file, then 'Hesperus' referring through its initial file cannot express the same sense as 'Hesperus' referring through the fusion file.

[15] This section draws its material from a talk, "On the transitivity of de jure coreference – a reply to Pinillos", given at the International Workshop Research(es) in Epistemology, Lisbon 19th-20th May 2011. In a recent paper (Goodsell 2014), Thea Goodsell also uses referential confusion to test de jure coreference, but our analyses and conclusions differ widely.

island and the African coast. Does the slash-term corefer with both basic terms in such circumstances? Does it even refer to anything at all?

To settle the question, I will build on the analysis Recanati gives of referential confusion in chapters 10 and 11 of (Recanati 2012). Recanati does not address the question of the reference of confused slash-terms, but he discusses in detail referential confusion involving 'recognitional demonstratives'. Unlike inclusive files associated with slash-terms, recognitional demonstrative files do not stem from a merging of two initial files. Yet they are composite like merging files, for they are based on two different epistemic relations, memory and perception (Recanati 2012). So, I will transpose here to slash-terms much of what Recanati says about confused recognitional demonstratives.

In his book, Recanati explores two alternative conceptions of confused reference. I shall call them respectively the *presupposition view* and the *dominance view*. I will try to show that both views lead to the same result: a slash-term cannot de jure corefer with both basic terms.

Let us proceed first with the presupposition view. In Recanati's system, a slash-name such as 'Sao Lourenço/Madagascar' has its reference fixed by a composite file that results from the merging of the files associated with the names 'Sao Lourenço' and 'Madagascar'. When a file is composite, Recanati says that it 'embodies a certain presupposition of identity' (Recanati 2012). In the case at hand, I guess Recanati would say the following: the merging file associated with the name 'Sao Lourenço/Madagascar' embodies the presupposition that the source of the information obtained through conversations involving the name 'Sao Lourenço' is the same as the source of the information obtained through conversations with users of 'Madagascar'. We know that this presupposition is false since Sao Lourenço is not Madagascar. On the presupposition view, a file *fails* to refer if the presupposition built into it is false. Hence, the slash-name has no referent, and statements in which it occurs are either false or truth-valueless. So, in cases of misidentification, there is neither coreference, nor a fortiori de jure coreference between the slash-term and the basic terms: the former is empty whereas the latter designate their respective referents.

We are now in a better position to explain why Slash-I inferences are not valid. A subject is never justified in making such inferences because nothing in the meaning of terms guarantees that reference and truth will be conserved across reasoning: a misidentification may occur in which case the premise involving the basic term may be true whereas the conclusion is either false or truth-valueless because of the confused slash-term[16]. To restore validity, one must add an identity premise to the effect that the basic terms have the same referent:

[16] As an anonymous referee reminds me, opting for truth-valuelessness instead of falsity is not without consequences on validity, however. Suppose we hold that, rather than being false, a statement lacks truth-value or is not determinately true when it involves a confused term (on the indeterminacy view, see more below this section). The non-validity of Slash-I inferences depends, then, on how we define 'valid'. If, following the standard use, we define validity as preservation of *truth* (or *determinate truth* under the indeterminacy view),

(Slash-I)*: Φ(a)
a = b

Φ(a/b)

If true, the identity premise guarantees that the presupposition of identity built into the inclusive file is satisfied and thus that the slash-term will have the same referent as the basic term in the first premise. In cases of misidentification, the conclusion is false (or truth-valueless) but the reasoning remains valid since the identity premise is false. The need for an additional identity premise shows, *pace* Pinillos, that there is no special link between slash-terms and basic terms: the transition from a 'Hesperus' premise to a 'Hesperus/Phosphorus' conclusion is *identity-dependent*, as is the transition from a 'Hesperus' premise to a 'Phosphorus' conclusion. This is evidence that the slash-name only *de facto* corefers with each basic name in the same way as basic names do with each other.

One may reply that my argument works only because I rely on a certain conception of confused reference. On this conception, referential confusion results in *emptiness*: a confused singular term has no referent, period. Yet, this does not square with our pre-theoretical intuitions. Intuitively, 'Sao Lourenço/Madagascar' is not on a par with terms like 'Sherlock Holmes' or 'Vulcain' (as used by astronomers between 1860 and 1916). Whereas these are entirely devoid of referent, it seems that the slash-name manages to refer, although confusedly: it refers both to the island and to the African coast – hence confused *reference* – without representing them as distinct – hence *confused* reference. A confused term fails by having too many referents, not by having none.

On such view, the risk of referential confusion is no bar to de jure coreference between slash-terms and basic terms, nor can it be argued to save transitivity – or so it seems. Consider thus a listener who understands (1) but wrongly thinks that Hesperus is not Phosphorus[17]. Since she understands (1), she grasps the intention of the speaker to use 'Hesperus' and 'it', as well as 'Phosphorus' and 'it', to refer to the same object. Consequently, on the view considered here, the listener will take 'it' as referring confusedly to *two* (presumed) objects, Hesperus

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Slash-I inferences are not valid in this sense. But suppose we opt for a weaker sense on which validity is defined as preservation of *nonfalsehood*. Slash-I inferences are valid in this latter sense because such inferences guarantee that if the premise is true, the conclusion is not false: even if the slash-term turns out to be confused, the conclusion is not false or determinately false since it is truth-valueless or indeterminately true – untrue does mean false on non-classical valuations. For my purpose, I do not need to settle which notion of validity is more intuitive or useful. Suffice it to point out this asymmetry: when an occurrence u de jure corefers with an occurrence u', the immediate inference from Φ(u) to Φ(u') is valid in the strong sense whereas a Slash-I inference is not. This suffices to mark off the relation between slash-terms and basic terms from true cases of de jure coreference.

[17] I reproduce here an objection made by an anonymous referee.

and Phosphorus. Yet, by doing so, she does not misunderstand the pronoun; she makes a mere empirical mistake, on a par with her false belief that Hesperus is not Phosphorus. So even under the supposition that the slash-term is confused, it still corefers with each of the basic terms (if these refer at all). There is then guaranteed conditional coreference, as expected if the slash-term de jure corefers the basic terms.

I agree that there is a sense in which it can be said that a singular term has several referents in cases of confusion. However, some explanations are in order. Indeed, unlike putative plural names such as 'The Beatles', a slash-term such as 'Sao-Lourenço/Madagascar' in (3) is not intended to refer to several objects at once – if it were, it would not be *confused*. Its singular form constrains the reference relation to obtain only when the term relates to a unique object. So how can 'Sao Lourenço/Madagascar' refer to two objects at once, in the achievement sense of 'refer'? To my mind, the only way to account for this idea is to resort to the notion of *partial reference* as elaborated in (Field 1973). On this view, referential confusion results not in emptiness but in *indeterminacy*. Referential indeterminacy is defined in terms of partial reference: a singular term indeterminately refers, say, to two objects a and b when it partially refers to a and partially refers to b; it determinately refers or fully refers to an object when it partially refers to this object and to nothing else. As full reference or determinate reference corresponds to the ordinary notion of reference, we can retain the presupposition view under discussion and still say that a slash-term fails to refer when the presupposition of identity built into it is false, provided that 'refer' means here 'determinately refer' and not 'partially refer'[18]. Statements accordingly receive supervaluationist truth-conditions (Van Fraassen 1966), in roughly terms: a statement 'T is F' is determinately true iff all partial referents of 'T' satisfy the predicate 'F', it is determinately false iff none of them does, and it has an indeterminate truth-value – it is neither determinately true nor determinately false – iff only some of them do.

Can partial reference and related notions make sense of de jure coreference between slash-terms and basic terms? At first sight, it seems so. Note first that the meaning of a slash-term guarantees that it will inherit the *partial* reference of each basic term: just by understanding (1), one can know that 'it' partially refers to whatever 'Hesperus' partially refers to, even if the pronoun turns out to be referentially confused. Correlatively, some inferences are now valid in the way expected if de jure coreference obtained. All inferences of the following pattern are thus valid:

$\Phi(a)$
$\Phi(b)$

$\Phi(a/b)$

[18] Here and after, 'refer' and 'true', when not otherwise specified, correspond respectively to 'determinately refer' and 'determinately true'.

Consider for instance the inference below in which the pronoun is intended to corefer with the occurrences of 'Hesperus' and 'Phosphorus':

Hesperus$_1$ is visible in the evening,
Phosphorus$_2$ is visible in the evening,

∴ it$_{(1,2)}$ is visible in the evening.

While not valid under the emptiness view of confused reference, this inference proves to be valid under the indeterminacy view. Suppose indeed that the 'Hesperus' premise and the 'Phosphorus' premise are both true but that, unbeknownst to the speaker, Hesperus is not in fact Phosphorus. Notwithstanding the confusion of the pronoun, the conclusion remains true since all partial referents of 'it' satisfy the predicate.

As promising as the indeterminacy view may sound for the advocate of non-transitive de jure coreference, it is of no more help than the previous view. As I will show soon, one of the main problems is that if we reformulate Pinillos' test in terms of 'partial reference', slash-terms do not even pass the test: understanding a piece of discourse involving a slash-term does not bring knowledge of conditional partial coreference with each basic term. Above all, Slash-I inferences remain non-valid, as they were under the emptiness view. Consider the following inference:

Hesperus is visible in the evening,

∴ Hesperus/Phosphorus is visible in the evening.

Assuming that the premise is true, what does happen if, unbeknownst to the speaker, it turns out that Phosphorus is not Hesperus and not visible in the evening? The conclusion lacks truth-value; it is neither determinately true nor determinately false as one of the partial referents of the slash-name satisfies the predicate (i.e. Hesperus) while the other does not (i.e. Phosphorus). This shows that the Slash-I inference does not conserve truth, contrary to what we would expect if the slash-name de jure coreferred with the basic name[19]. The reason is that Slash-I inferences may not conserve reference, that is, determinate reference: in cases of misidentification, 'Hesperus/Phosphorus' does not determinately refer to the planet that 'Hesperus' determinately refers to.

[19] The above paradox finds thus its explanation: one cannot know a priori that a = b because the Slash-I inference from 'a = a' to 'a = a/b' (or from 'b = b' to 'a/b = b') is not valid. A subject can never exclude a priori that she misidentified a as b, in which case 'a = a' is determinately true whereas 'a = a/b' is neither determinately true nor determinately false. On the indeterminacy view, 'a = a/b' is determinately true iff it is true on all assignments of partial referents to 'a' and 'a/b'. Yet the statement is false when a and b are assigned as partial referents of, respectively, 'a' and 'a/b' (remember that a is not b in such scenario).

It appears, then, that on both versions of the presupposition view, emptiness versus indeterminacy[20], slash-terms relate to basic terms in a way that differs dramatically from de jure coreference since replacing the latter by the former does not guarantee that reference and truth will be conserved. So, whatever special relation a slash-term may have with the basic terms, it is not de jure coreference and it cannot be argued against its transitivity.

Still, one may object that something must be amiss with my argument since, after all, slash-terms pass Pinillos' test for de jure coreference: anyone who fully grasps 'a' and 'a/b' thereby knows that 'a' and 'a/b' (determinately) refer to the same thing if they (determinately) refer at all. Thus, a competent user of 'Hesperus/Phosphorus' knows that if the slash-name refers to anything at all, its referent satisfies the presupposition of identity built into the inclusive file, namely, the condition of being identical both to Hesperus and to Phosphorus. She knows, therefore, that if the slash-name and each of the basic names refer at all, they refer to the same thing. Knowledge of conditional (determinate) coreference holds even in cases of misidentification since the consequent is then false – e.g. 'Hesperus/Phosphorus' indeterminately refers and, as such, does not determinately refer to what 'Hesperus' or 'Phosphorus' determinately refers to – but the antecedent is false too as the slash-name has no determinate referent.

I reply that the fact that slash-terms pass Pinillos-Recanati's test reveals instead that the proposed test is far too liberal. This is made manifest by uncontroversial cases of mere de facto coreference that involve knowledge of conditional coreference. Suppose thus that the name 'Vesperus' is introduced according to the following reference-fixing rule:

'Vesperus' refers to Hesperus if $G = 6{,}67.\ 10^{-11}$ N. $(m/kg)^2$, and to nothing otherwise.

The rule ensures, at least for the stipulator, that if 'Vesperus' and 'Hesperus' have a referent, they refer to the same thing, viz. Hesperus. So the pair 'Vesperus'-'Hesperus' passes Pinillos' test. However, the notion of de jure coreference would loose all its meaning if 'Vesperus' were said to de jure corefer with 'Hesperus': it is not a semantic fact that the former corefers with the latter if the latter refers at all; assuming that 'Hesperus' has a referent, 'Vesperus' corefers with 'Hesperus' only conditionaly on the *extra-semantic* fact that the gravitational constant has such and such value – hence *de facto* coreference. The suspicion here is that slash-terms are exactly on a par with terms like 'Vesperus': assuming that 'Hesperus' has a referent, 'Hesperus/Phosphorus' in (2) or 'it' in (1) corefer with 'Hesperus' only conditionaly on the extra-semantic fact that Hesperus is Phosphorus. Likewise, Slash-I inferences are non-valid in exactly the same way as are the analogous direct substitutions of 'Hesperus' by

[20] These are not meant to be exhaustive, however. Another, though marginal, view of referential confusion holds that a confused term refers to a mereological sum of objects – those to which the term is confusedly applied (Fine 2007, Goodsell 2014). I will not consider it here as Thea Goodsell has shown that it does not allow for de jure coreference between slash-terms and their antecedents (Goodsell 2014).

'Vesperus'[21]. In any case, the counterexample of 'Vesperus' shows that we need a stronger test for de jure coreference.

An adequate test should reflect what is known in paradigmatic cases of de jure coreference, such as anaphoric pronouns or tokens of a same name. So let us take two occurrences of 'Hesperus' uttered with the intention to corefer. I agree with Pinillos and Recanati in saying that a competent speaker knows that the occurrences of 'Hesperus' refer to the same thing if they refer at all. Knowledge of conditional coreference stems from the fact that de jure coreference involves an *identity condition*:

> **Identity Condition**: An occurrence u de jure corefers with an occurrence u' only if it is a semantic fact that: $((\exists x)$ (u refers to x) $\wedge$ $(\exists x)$ (u' refers to x)) $\rightarrow$ (ref (u) = ref (u'))[22].

Yet, the fact that two coreferential occurrences verify the identity condition is necessary but *not sufficient* for de jure coreference to obtain. A competent speaker knows something *more*: she knows that one occurrence of 'Hesperus' refers to something if and only if the other does too. In other words, she knows that either both refer, or both fail to refer like tokens of a same empty name (e.g. 'Vulcain') or confused name (e.g. 'Sao Lourenço/Madagascar')[23]. Let us call this 'knowledge of correlated reference'. Such knowledge stems from the fact that de jure coreference involves, in addition, a *co-existence condition*:

> **Co-existence Condition**: An occurrence u de jure corefers with an occurrence u' only if it is a semantic fact that: $(\exists x)$ (u refers to x) $\leftrightarrow$ $(\exists x)$ (u' refers to x).

Putting both conditions together, I will say that de jure coreference involves *referential equivalence*:

> **Referential Equivalence**: An occurrence u de jure corefers with an occurrence u' only if it is a semantic fact that: $(\forall x)$(u refers to x $\leftrightarrow$ u' refers to x).

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[21] The analogous valid rule for the name 'Vesperus' would be thus:

(Vesperus-I)*: Φ(Hesperus)
G = 6,67. 10^{-11} N. $(m/kg)^2$

Φ(Vesperus)

The empirical premise about G plays the same intermediary role as the empirical identity premise in the Slash-I* rule seen above.

[22] 'ref(…)' abbreviates 'the referent of…'

[23] As indicated above, if not specified otherwise, 'refer' corresponds to 'determinately refer' in the indeterminacy view.

We thus obtain a stronger test than Pinillos and Recanati's: there is evidence that two coreferential occurrences u and u' de jure corefer in a piece of discourse when anyone who understands the discourse knows thereby that for all x, u refers to x if and only if u' refers to x. Clearly, anaphoric pronouns and tokens of a same name pass the test as they satisfy the condition of referential equivalence, even when reference fails: any competent and reflective speaker who utters (with the same referential intention) two tokens of the empty name 'Vulcain' knows thereby that they are referentially equivalent[24].

However, slash-terms fail the test: the competent user of 'it' in (1) or 'Hesperus/Phosphorus' in (2) can never exclude the possibility that a misidentification occurred, in which case there is no correlated reference: each basic name refers to its respective planet whereas the slash-term refers to nothing. This shows that the meaning of a slash-term does not guarantee referential equivalence with each basic term. Hence, by the referential equivalence test, there is at most de facto coreference here.

It will be replied that this result proves only that the equivalence test is too strong, as shown by the fact that my test is blatantly inaccurate for slash-*pronouns* – or so it may be argued. I did indeed say that slash-pronouns are *anaphora*. I recalled also that anaphoric links are cases *par excellence* of de jure coreference. Then, slash-pronouns cannot but pass the test for de jure coreference, at least insofar as the proposed test is accurate. If, as here, they fail, that should condemn the test, not the terms.

To my mind, this objection should be turned the other way around. *If*, following Pinillos, we assume that there are slash-pronouns, then we must be prepared to say that some special anaphora do not de jure corefer with their antecedent, as they do not pass the equivalence test. If, on the other hand, we hold that anaphora differ from tokens of names in that they admit of no such exception (as I tend to believe), then the best conclusion is that there is no – there cannot be – such thing as 'slash-pronouns'. But by no means does the latter option deny that 'it' or 'this planet' are anaphora in statements like (1). Such a position is utterly compatible with recognizing that (1) is a meaningful statement in which 'it' and 'this planet' function as genuine anaphoric pronouns. However, it asks us to not take Pinillos's coindexing at face value. On such view, 'it' is anaphoric on *only one* name, presumably 'Hesperus', with which it de jure corefers; the false impression that the pronoun would de jure corefer with both 'Hesperus' and 'Phosphorus' simply stems from the fact that 'it' de jure corefers with 'Hesperus' while Hesperus is believed to be Phosphorus. This impression vanishes when we consider related statements like:

[24] Of course the fact that two occurrences of 'Vulcain' verify the condition of referential equivalence does not mean that they de jure corefer since de jure coreference implies coreference *tout court* which in turn requires non-empty reference. Let us remind ourselves that referential equivalence is a necessary but not sufficient condition of de jure coreference. It can be used as a test only when combined with the empirical knowledge that the tested occurrences de facto corefer, and so have a referent.

If Hesperus$_1$ is Phosphorus$_2$, then it$_1$ is visible both in the evening and in the morning. However, all the observations indicate that it$_1$ is a distinct planet from Phosphorus$_2$.

Here, I will not try to decide between these two options, though for the sake of the discussion I will keep on talking of slash-pronouns as if there were some. Either way, the result is the same: the equivalence test shows that pronouns involved in Pinillos'examples do not de jure corefer with both antecedent terms.

Would the same conclusion follow, however, if we formulated the referential equivalence condition in terms of *partial* reference rather than in terms of full reference? We would then test de jure coreference by testing de jure partial coreference. At first sight, this version of the test is more hospitable to de jure coreference since slash-terms seem to verify the coexistence condition for partial reference. Indeed, anyone who understands (2) appears to be in a position to know that 'Hesperus' partially refers to something if and only if 'Hesperus/Phosphorus' does too: if 'Hesperus' has a partial referent, it is *eo ipso* inherited by 'Hesperus/Phosphorus', which ensures that the slash-name partially refers even in case of misidentification. Conversely, if 'Hesperus/Phosphorus' has partial reference, it seems that it should inherit at least one of its partial referents from 'Hesperus', which means that the basic name has partial reference too. However, let us look more closely at the latter conditional. Is it so obvious that a basic name partially refers if the slash-name does too? Could a speaker exclude a priori that 'Hesperus/Phosphorus' is in a situation comparable to that of 'Sao Lourenço/Madagascar'? According to one version of the history of the name 'Madagascar' (Grandidier 1891), the name was not referring to anything at all, even partially, when Portuguese discovered the island known today under this name. Following a misinterpretation made by Marco Polo on a hearsay report of Arab sailors, the geographer Martin Behaim coined 'Madagascar' to name a hypothetical island located off the north shore of Zanzibar. Unfortunately, there was no such thing. This first mistake led the Portuguese to believe wrongly that what they knew as 'Sao Lourenço' was in fact the sought-after island. Suppose now that Diogo Dias asserts (3). The slash-term has partial reference since it partially refers to Sao Lourenço[25]. Yet the basic name

[25] Cases like this raise an interesting complication for the indeterminacy view of referential confusion championed by Hartry Field. Assuming that this version of the history of 'Madagascar' is true, it turns out that 'Sao Lourenço/Madagascar' has a *unique* partial referent, viz. Sao Lourenço Island. On Field's view, a singular term determinately refers when it has a unique partial referent, from which it follows that 'Sao Lourenço/Madagascar' is not referentially confused after all: it fully refers to Sao Lourenço Island just like the name 'Sao Lourenço'. To my mind, this result is altogether counterintuitive. Intuitively, the slash-name is no less confused than if 'Madagascar' had a referent. The difficulty we face here comes from a more general problem: How to define confusion for empty or partially empty terms? Although it does not seem to be intractable, I leave it aside for another occasion.

'Madagascar' is devoid of partial referent. The possibility that only one of the basic terms might be empty reveals that, unlike true cases of de jure coreference, the link between slash-terms and basic terms does not guarantee correlated partial reference.

Things don't get better if we test slash-terms by means of the identity condition for partial reference:

> **Identity Condition***: An occurrence u de jure corefers with an occurrence u' only if it is a semantic fact that: $((\exists x)$ (u partially refers to x) $\wedge$ $(\exists x)$ (u' partially refers to x)) $\rightarrow$ $(\forall x)$(u partially refers to x $\leftrightarrow$ u' partially refers to x).

In other words, if two occurrences de jure corefer one with each other, it is guaranteed that they have the same partial referents if they partially refer at all. Correlatively, Pinillos' test proceeds now by testing knowledge of conditional partial coreference. Now, suppose again that, unbeknownst to us, Hesperus and Phosphorus turn out to be two distinct planets. Does the pair 'Hesperus' and 'it' (equivalently, 'Hesperus/Phosphorus') satisfy the identity condition* in (1)? The antecedent is true: both 'Hesperus' and 'it' partially refer to something, Hesperus for the former, and both Hesperus and Phosphorus for the latter. The consequent is false, however, because the pair of terms falsifies the conditional from right to left: not all partial referents of 'it' are partial referents of 'Hesperus'; 'it' partially refers to Phosphorus whereas 'Hesperus' does not. This shows that there is no guaranteed conditional partial coreference between a slash-term and the basic terms. Yet there is such a guarantee in paradigmatic cases of de jure coreference. It appears then that whatever relation one tests, partial reference or full reference, the relation between slash-terms and basic terms lacks crucial features of de jure coreference. This is evidence, again, that there is nothing more than de facto coreference in such cases.

6 The Dominance View

This conclusion is too hasty, however. The foregoing considerations rest on what I have called the 'presupposition view' about confused reference, yet I have said that (Recanati 2012) offers a more sophisticated account of confused reference: the dominance view. On such view, a composite file embodies a certain presupposition of identity but this presupposition does not automatically constrain the reference of the file. As Recanati puts it: "the failure of the presupposition built into the file may be harmless" (Recanati 2012). Suppose that the presupposition built into the file of 'a/b' is falsified, as it turns out that a is not b. What then will determine the reference of the slash-term if the presupposition has no reference-fixing or reference-constraining role? Recanati's response is twofold: first, the referent of the composite file is not what is identical to both a and b – there is no such thing – but the object which is the *dominant source* of the information stored into the file (Recanati 1993, 2012; see also Evans 1973). Second, what counts as the dominant source depends on *context*: in a context in which the subject exploits only information coming from a, it is the

part of the composite file which stored information coming from a that will be activated. This makes a the dominant source of information of the file, and so, on the view discussed here, the referent of the whole file. But in another context in which b outweighs a in terms of information, b captures the reference of the whole file. Hence, an assumed consequence of the dominance view is that the reference of a confused name *shifts* across contexts (Recanati 2012).

Now, does the dominance view plead in favour of de jure coreference between slash-terms and basic terms? At first sight, it seems so.

Consider indeed Slash-I inferences. While not allowed by the presupposition view, such inferences appear to be valid under the dominance view. Suppose, thus, that a subject infers that *a/b is F* from the premise that *a is F*. The way the conclusion is obtained entails that the subject will activate the part of the inclusive file that stores information coming from a. In such a context, a is the dominant source of the file associated with the slash-term, and it is then guaranteed that the slash-term will corefer with the basic term when the premise is true. Moreover, this fact is transparent to the speaker: if she acquires the information that a/b is F through a Slash-I inference on 'a is F', she will know, at least implicitly, that a is the dominant source of information for her thought that a/b is F. The transparency of dominance justifies her in making the inference. Now comes the important point: even if the presupposition of identity built into the inclusive file is false, the slash-term keeps on coreferring with the basic term, so that reference is conserved across reasoning. It would be easy to show that in such contexts, terms pass the test of referential equivalence given above. It is evidence that de jure coreference holds between a slash-term and each basic term in the context of a Slash-I inference.

However, things go wrong if we consider the reverse pattern of inference, i.e. the Slash-E rule. Here, it is exactly the other way around: while allowed by the presupposition view[26], Slash-E inferences are no longer valid under the dominance view.

Suppose for instance, that Diogo Dias, our Portuguese sailor, says:

(4) Sao Lourenço/Madagascar is the only place to find lemurs.

Suppose, moreover, that Diogo does not remember how he got this information: he does not remember whether he got it in the first place from users of the name 'Sao Lourenço', or

[26] The reason is the following: suppose that 'a/b is F' is true. Then 'a/b' refers to something since a statement is not true when it involves an empty term. On the presupposition view, 'a/b' refers to a certain object x only if x satisfies the presupposition of identity built into the inclusive file associated with 'a/b', this presupposition being that the referent is identical to both a and b. So, the truth of 'a/b is F' implies that something, which is identical to a, is F, in other words, that a is F.

whether he got it from users of the name ‘Madagascar’. He cannot, of course, scrutinize the content of his initial files to settle the question, because the two files have exchanged their content as a result of the linking operation. Suppose now that he obtained the information through conversations with users of ‘Sao Lourenço’. It follows that the island is the dominant source of the inclusive file associated with the name ‘Sao Lourenço/Madagascar’. So, on the dominance view, the slash-name refers in (4) to the island, and not to the African coast. Crucially, this fact is *not transparent* to the speaker: understanding a slash-term does not put one in a position to know what is the dominant source of the inclusive file in the current context. Is Diogo, then, justified in making the following inference?

Sao Lourenço/Madagascar is the only place to find lemurs,

∴ Madagascar is the only place to find lemurs.

No, he is not, because reference shifts across reasoning: the premise is true since the slash-name refers to the island and the island is the only home for lemurs, but the conclusion is false as the basic name refers to the African coast where there are no lemurs. Slash-E inferences are thus non-valid under the dominance view: understanding a slash-term never guarantees that the reference will be conserved across such reasoning. This shows, again, that there is no de jure coreference between slash-terms and basic terms.

It can be replied that my objection proves nothing for it exploits a very general phenomenon, namely the context-sensitivity of reference. It affects not only slash-terms, but all kinds of referential terms, including those that provide uncontroversial cases of de jure coreference. Take, for instance, ordinary names. Suppose that I assert (5) while seeing Paderewski haranguing the crowds:

(5) Paderewski is a great politician.

Later, I hear Paderewski at a piano concert, and I say:

(6) Paderewski is a brilliant pianist.

Suppose moreover that, unlike in Kripke’s original story, the possibility of a confusion between homonymous names does not occur to me at the time of (6). This is, then, a paradigmatic case of de jure coreference holding between tokens of the same name. The time goes by, and now I remember uttering (5) and (6). Can I know that the occurrences of the name corefer (if they refer at all) just by understanding (5) and (6)? Not under the dominance view, even if the two occurrences were uttered with a coreferential intention. For all I know, I cannot exclude that my use of the name ‘Paderewski’ is confused. Maybe I confused twins, one of whom is a politician and the other a pianist. If so, the file associated with my uses of the name ‘Paderewski’ stores information coming from two distinct sources, Twin1 and Twin2. If Twin1 was the object of my visual experience, then Twin1 was the dominant source

of information at the time of (5), and my use of the name referred to Twin1 in such context. Similarly, if Twin2 was the one I heard at the piano concert, Twin2 was the dominant source at the time of (6) and my use of the name referred to Twin2 in this context. This shows that even the best candidates for de jure coreference are vulnerable to reference shifting. So there is nothing special with slash-terms, and my objection proves too much: if the context-sensitivity of files prevents de jure coreference from obtaining between slash-terms and basic terms, then it prevents it from obtaining everywhere else.

Agreed, but I think that this line of defence is unconvincing. Referential confusion still reveals a deep asymmetry between slash-terms and paradigmatic cases of de jure coreference. To clarify this I will, once more, draw on Recanati's analysis of confused reference. I recalled that, on the dominance view, the failure of presupposition may be harmless: a file that stores information coming from different sources may nevertheless succeed in referring to one of its sources insofar as that one dominates. Yet, Recanati points out that a presupposition failure may be *operative* even under the dominance view: it impacts reference whenever the presupposition has "relevance to the current train of thought" (Recanati 2012). To illustrate this, let's go back to the 'Paderewski' example and suppose that the name confusedly refers to twins. If, as happens in the original example, I assert the statements (5) and (6) *separately*, without intending to mix the information, the reference of the file associated with the name will obey the dominance rule, from which it follows that reference shifts. But suppose I assert (5) and (6) *in the same breath*, and conclude from there that Paderewski is both a great pianist and a great politician. In such a case, Recanati says that the presupposition rule outweighs the dominance rule. Indeed, by conjoining (5) and (6) in the same reasoning, I *trade upon the identity* of two distinct informational sources (Recanati 2012; Campbell 1987); I reason as if the information stored into the file came from a unique source. In the first 'Paderewski' example, I merely presupposed that my occurrences referred to the same individual through the same name; that was the effect of the coreferential intention accompanying my utterances. In the current example, I effectively *exploit* this identity presupposition in order to integrate and transform information in reasoning. Thus, trading upon identity adds something substantial to mere coreferential intention, with the main effect being to reactivate the presupposition of identity built into the file, that is, that all pieces of information collected in the file derive from the same object. As this presupposition is false, the occurrences of the name 'Paderewski' in (5), (6) and the conclusion are all denotationless (or referentially indeterminate). However, this does not jeopardize de jure coreference nor the validity of the reasoning, since even in case of referential confusion, it remains that occurrences of a same name are such that either all refer to the same thing, or all are denotationless (or indeterminate).

Contrast this with what happens when the premises and the conclusion of such 'integrative' reasoning involve, respectively, some basic names and a slash-name. Suppose, for instance, I reason as follows:

Sao Lourenço is full of lemurs,
Madagascar is so-called by African natives,

∴ Sao Lourenço/Madagascar is a place full of lemurs, which is called 'Madagascar' by African natives.

As seen above, the presupposition rule prevails in such a context. Whatever is the dominant source of the file associated with the slash-name, the file will refer only if the presupposition of identity built into it is satisfied. In the case of an inclusive file, the presupposition is that the sources of the initial files are identical, and it turns out to be false here. The slash-name has then no (determinate) referent and the conclusion is either false or truth-valueless. However, referential confusion does not affect the reference of the basic names, nor the truth of the premises. This shows that, in contexts in which the rule of presupposition prevails, there is no guarantee that reference and truth are preserved when slash-terms are substituted for basic terms. It is evidence, once more, that slash-terms do not de jure corefer with basic terms.

Let's recap the main points of the dominance view. It asks us to distinguish between two cases:

1°) There are, first, contexts in which the speaker trades on identity of reference. In such cases, the presupposition rule prevails, and the risk of confusion entails that the preservation of reference is not guaranteed, especially across Slash-I inferences. There is, then, no de jure coreference between the slash-term and the basic terms. A fortiori, there is no transitivity failure of de jure coreference.

2°) Second, there are contexts in which the dominance rule prevails, as the presupposition of identity is not operative. In such cases, I concede to Recanati that a slash-term may de jure corefer with *one* of the basic term *singly taken*, especially in a context of a Slash-I inference, but note that such link is much more restricted than Pinillos and Recanati thought: as soon as a Slash-I inference is made in a context involving more than one basic term, this reactivates the presupposition of identity built into the inclusive file, thus breaking the link between the slash-term and the basic terms.

Of course, a speaker can make valid Slash-I inferences in different contexts, starting each time from a different basic term. Thus, one may validly infer that *a/b is F* from the premise that *a is F*, and, later, validly infer that *a/b is P* from the premise that *b is P*. Since 'a/b' de jure corefers with 'a' in the first context, and since it de jure corefers with 'b' in the second context, this may give the false impression that there is a single context in which the slash-term de jure corefers with both basic terms. The fallacy here lies in neglecting the effect of context change. The slash-term de jure corefers with the basic term 'a' in the first context, c_1, because a is the dominant source of information in such a context. But it is crucial to note that

for the same reason, the slash-term does not de jure corefer with the basic term ‘b’ in the context c_1. When the second inference is made, this creates a new context, c_2, in which the role of the dominant source shifts, from a to b. Accordingly, de jure coreference obtains between the slash-term and the basic term ‘b’, but in that case then, it no longer holds between the slash-term and the term ‘a’. Likewise, the first occurrence of the slash-name in c_1 does not de jure corefer with its second occurrence in c_2 – reminding us of the referential shift of the name ‘Paderewski’ seen above. In other words, I suspect that the misleading impression that a slash-term de jure corefers with *several* basic terms *at once* has its roots in the following fallacy[27]:

Inferring from

(∃c) (‘a/b’ corefers_{dj} with ‘a’ in c) (true)

and

(∃c) (‘a/b’ corefers_{dj} with ‘b’ in c) (true)

to

(∃c) (‘a/b’ corefers_{dj} with ‘a’ in c ∧ ‘a/b’ corefers_{dj} with ‘b’ in c) (false)

I take it as one of the merits of the dominance view that it explains this false intuition away. The upshot is that a slash-term may de jure corefer which each basic term singly taken, but in two different contexts. There is no single context in which a slash-term would de jure corefer with both basic terms. I conclude that even when the dominance rule prevails, there is no transitivity failure of de jure coreference.

7 Conclusion

I have endeavoured to show that, whatever view one takes about confused reference, there is no context in which a slash-term would de jure corefer with several basic terms coreferring only de facto with each other. A slash-term can at most de jure corefer with only *one* basic term *per context*. So Pinillos is wrong: slash-terms are not a case against transitivity of de jure coreference. Still, I concede to Recanati a slight infringement on the Fregean orthodoxy by allowing that de jure coreference is sustained not only by identity of files but also by the inclusion relation that holds between initial files and fusion files. These exceptions are very limited however: they occur only in some (not all) Slash-I inferences, under the contextual condition that the presupposition of identity is not operative. The *raison d’être* of a mental file is to collect and mix information derived from a presumed unique source. As soon as a file is exercised in accordance with its natural presupposition, de jure coreference cannot be realized by anything else but by identity of files.

[27] The variable ‘c’ takes its values among contexts. In accordance to the contextualism conveyed by the dominance view, de jure coreference is relativized to context, resulting in a 3-places relation between a pair of terms and a context.

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