A four-way distinction in English definite expressions

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Abstract. Analyses of pronouns, definite descriptions, and demonstratives range from treating them to be independent of each other to treating them with parallel semantics. In this paper, I compare the semantic contribution of different building blocks of these expressions and propose to delineate the semantic space of definite descriptions along two dimensions: between the form of the content (pronominal vs. description) and the mechanism of reference (anaphoric vs. deictic). To support this, I provide two pieces of evidence. First, I show that deictic and anaphoric pronouns have distinct semantic and distributional properties. Second, I show that the NP content of a definite description makes the same semantic contribution as the gender inference of a pronoun.

Keywords: pronouns, definite descriptions, demonstratives, presuppositions.

1. Introduction: definite expressions

It is well-known that a pronoun like English *she*, a definite description like *the linguist*, and a demonstrative description like *that linguist* overlap in their semantic contribution and distribution (Heim, 1983; Neale, 1988; Evans, 1980; Roberts, 2003; Elbourne, 2005, 2008: a.o.). For example, in a context where there is one unique female entity who is a linguist, as provided by the context in (1), it is possible for the three sentences in (1a), (1b), and (1c) to refer to the same entity.

(1) I have a meeting with a linguist who sent me her CV yesterday.
   a. It turns out that she studies semantics.
   b. It turns out that the linguist studies semantics.
   c. It turns out that that linguist studies semantics.

Despite this overlap, these expressions have important differences that are highlighted in the literature. For example, pronouns are highlighted for their flexibility in reference and assignment dependence (Sudo, 2012). Definite descriptions, on the other hand, are highlighted for their licensing requirements, with debates on whether they require uniqueness, familiarity, or something else (Frege, 1892; Heim, 1983; Roberts, 2003; Schwarz, 2009; Coppock and Beaver, 2015), or what the nature of this requirement is (Russell, 1905; Strawson, 1950). Demonstratives are highlighted for their deictic reference to entities in the physical context, and whether their reference is rigidly denoted (Kaplan, 1989; King, 2001; Roberts, 2002; Ebert et al., 2020). This is reflected in the general analyses we assume for these expressions, where pronouns are treated as variables, definite descriptions as carrying some uniqueness- or maximality-denoting operator, and demonstratives carrying some deictic component. Other analyses treat them as sharing the same underlying mechanism but minimally differing in their licensing condition or implications. For example, some analyze pronouns as definite descriptions with minimal differences (Evans, 1980; Elbourne, 2005; Abbott, 2008; Neale, 1988), while some analyze definite descriptions as variables that require familiarity like pronouns (Heim, 1982, 1983; Roberts, 2003). As for demonstratives, many have argued that they are marked definite descriptions, carrying some additional presupposition or restriction (Wolter, 2006; King, 2001; Elbourne,

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2008; Nowak, 2021; Roberts, 2002). I call the latter view where all three definite expressions are considered to share some underlying mechanism the 'uniform view'.

In this paper, I propose a variant of the uniform view, where pronouns, definite descriptions, and demonstratives share one general mechanism. I diverge from previous accounts in proposing a four-way distinction in English definite expressions where they differ along two dimensions. The first dimension is the form of the expression: pronominal vs. descriptive. The second dimension is the mechanism of reference: deictic vs. non-deictic. Thus, instead of a three-way distinction between pronouns, definites, and demonstratives, what results is a division as shown in (2), with some personal pronouns such as *he* and *she* occupying two cells.

(2) English definite expressions:

	pronominal	description
deictic	*he, she, that, those*	*that linguist*
non-deictic	*he, she, it, they*	*the linguist*

There are two parts to this analysis. The first is establishing that deictic expressions differ from anaphoric expressions in semantically-relevant ways. Specifically, I argue that deictic expressions carry an overt linker to the actual context, and that English pronouns are ambiguous between deictic and anaphoric forms and furthermore compete with demonstrative pronouns. In doing so, I diverge from the general practice of treating deixis as subsumed under anaphora (Heim and Kratzer, 1998: a.o.). I show that this analysis correctly captures the distribution of demonstratives that host relative clauses, and the distribution of different pronouns that have been pointed out by Elbourne (2013). Once the two underlying structures for anaphoric and deictic expressions are established, the second part of the analysis shows that pronominal expressions and descriptive expressions make the same exact semantic contribution, namely presupposing that the given referent meets some property. The only difference between a pronoun like *she* and a definite description like *the linguist* is what property it requires of the referent: ϕ-features like gender for the pronoun and the NP for the definite description.[1] This parallel between pronouns and definite descriptions is similar to what is assumed in familiarity theories of definites (Heim, 1982, 1983), though the formal details differ. In this work, I provide evidence that the semantic contribution of the NP restriction of a definite description is identical to that of ϕ-features of a pronoun. Specifically, I show that both are backgrounded in nature and show presuppositional behaviors.

After establishing the difference between anaphoric and deictic definites and the parallel between pronominal and descriptive definites, I propose an analysis of these expressions where the ϕ and NP contents are presupposed and the linker argument responsible for deictic reference is at-issue.

The organization of the paper is as follows. In the rest of the introduction, I present Elbourne's (2013) D-type theory, where pronouns are analyzed as definite descriptions with elided NPs. I will present some of the main aspects of the D-type theory and show its limitations, which will be addressed in the following sections. Because what I propose here is similar to D-type theory in spirit but has nontrivial differences, I will call the analysis in this paper the D-2 theory

[1] Gutzmann and McCready (2014) have already made this argument of locating the descriptive content of definite descriptions and pronouns at the use-conditional dimension, where they require the referent to meet the descriptive content.

of pronouns. In Section 2, I discuss the distinction between deictic and anaphoric content, focusing on demonstrative descriptions vs. definite descriptions. I show that demonstratives should be analyzed as carrying a linker to the actual world, which definite descriptions lack. Then, in Section 3, I add pronouns to the picture, showing that they realize the same anaphoric and deictic reference, but with ϕ information and not NP content. Then, in Section 3.1 I provide novel evidence that this content they carry is backgrounded for both pronouns and definite descriptions.

1.1. Pronouns vs. definite descriptions

Pronouns and definite descriptions are generally highlighted for different characteristics: pronouns for being flexible and assignment-dependent, and definite descriptions for their licensing condition such as uniqueness and existence. The different foci in analyzing them are reflected in the way they are analyzed in formal semantics. In general, a pronoun is analyzed as a variable that is sensitive to indexing (Heim and Kratzer, 1998). Thus, a pronoun *she* with an index *i* evaluated against the assignment *g* returns the individual that the assignment function *g* assigns *i* to. Their ϕ-features such as gender and number are assumed to be presupposed of that entity (Heim and Kratzer, 1998; Sudo, 2012; Elbourne, 2013: a.o.). A general denotation of a pronoun *she* is shown in (3).

(3) $[\![\text{she}_i]\!]^g$ = g(i), if g(i) is female; undefined otherwise

On the other hand, definite articles are often analyzed as taking an NP as an argument and returning some entity that meets that NP restriction. Under the Fregean account of definite descriptions, a definite description such as *the linguist* presupposes an existence of a unique entity that is a linguist and returns that unique linguist as an output. This is shown in (4a) from Heim and Kratzer (1998), where existence of a unique entity such that f(x) is true is specified, and in (4b) from Elbourne (2005), where this uniqueness is relativized to a situation variable.

(4) a. $[\![\text{the}]\!] = \lambda$f: f$\in D_{<e,t>}$ and there is exactly one x$\in C$ such that $f(x) = 1$. the unique $y \in C$ such that $f(y) = 1$ (Heim and Kratzer, 1998)

b. $[\![\text{the}]\!] = \lambda \text{f}_{<e,t>}.\lambda$s: s$\in D_s \wedge \exists!$x f(x)(s)=1. ιx f(x)(s) = 1

(i) [[the NP] s]

(ii) ιx f(x)(s) = 1 is defined if there is exactly one entity *y* such that f(y)(s) = 1; when defined it returns that very individual; if not defined, no semantic value is returned (Elbourne, 2005)

In the way the two kinds of expressions are analyzed, pronouns are seen as dependent, referring to something that is already established in the context, while definite descriptions are seen as expressions that can stand on their own, as long as some uniqueness condition is met.

The denotations in (3) and (4) make use of the same building blocks of meaning, though they are implemented through different mechanisms. Relativized uniqueness and existence, for example, are presupposed through the ι operator in (4) but are subsumed under the mechanism of anaphora in (3): for a successful anaphoric reference, the intended antecedent must exist uniquely in the relevant context. The information that restricts the entity is also present in the two denotations but derived in different ways: the gender information is presupposed of a given

entity in (3) while the NP information is taken to be restrictions of an ι operator in (4). These similarities have motivated a number of uniform analyses. For example, many have argued that pronouns are (elided) definite descriptions (Elbourne, 2005; Evans, 1980; Abbott, 2008; Hawthorne and Manley, 2012; Bi and Jenks, 2019), definite descriptions carrying index information (Schlenker, 2005; Royer, 2022), or descriptions with ϕ information (von Heusinger, 2002; Postal, 1966). Thus, these accounts derive the meaning of pronouns from definitions similar to (4). Others have argued that definite descriptions should be analyzed as being anaphoric, thus deriving the meaning of definites from definitions similar to (3). This view is represented by familiarity theory of definites (Heim, 1982, 1983; Roberts, 2003), where definite descriptions require their referent to be familiar to the discourse, just as a pronoun is. More recently, definite articles across languages have been observed to distinguish unique and familiar uses morphosyntactically, thus motivating accounts where definite articles have an option of carrying an anaphoric index in addition to the NP in its restriction in a structure similar to (4) (Schwarz, 2009).

1.2. D-type theory of pronouns

I take D-type theories of pronouns, specifically that of Elbourne (2013) as the departure point of this work because, as noted above, the main purpose of this paper is to argue for a nearly full parallel between pronouns and definite descriptions. While details differ, the main argument in D-type theories of pronouns is that pronouns have the semantics of a definite description. For example, Elbourne argues that a pronoun has the same semantics as a definite article in a definite description but with the NP deleted. The restrictions that come with NP ellipsis account for the formal link between the antecedent and the pronoun, while the similarities between the two expressions are captured through uniform semantics that presuppose the uniqueness of an entity meeting the NP denotation in a given situation.

While this paper will adopt the main intuition of Elbourne (2013) and argue for a uniform account of pronouns and definite descriptions, there are two aspects of this work that will not be maintained. The first is the uniform treatment of deixis and anaphora. Many works in formal semantics subsume deixis under anaphora, formally deriving them through indices. This assumption is evident in Heim's (1983) treatment of contextually perceived entities as familiar entities, and Roberts's (2003) categorizing deictically available entities as weakly familiar. In Elbourne (2013), the difference between deixis and anaphora boil down to the difference in identifying the deleted NP. In anaphoric cases, the NP is present in the discourse and overtly mentioned, while in deictic cases, those that involve 'a strong visual clue in the immediate environment' (p.197), the NP is contextually provided and presumably shared across conversation participants. Crucially, there is no distinction in the semantics of the pronoun between deictic and anaphoric uses. I will discuss in the next section a motivation for making this distinction, which will categorize 'non-deictic' or anaphoric pronouns *it* and *they* separately from 'deictic' pronouns *that* and *those*, and ambiguous pronouns *she* and *he*.

Second, Elbourne (2013) abstracts away from discussing ϕ-features of pronouns, noting that they should be analyzed 'probably as presuppositions' (p.193). Thus, under this assumption, pronouns differ from definite descriptions in that they additionally carry ϕ-feature requirements

as presuppositions. In Section 3.1 I will argue for doing away with this distinction, showing that the NP property of a definite description shows the same presuppositional behavior as ϕ-features of a pronoun, thus occupying the same status as them.

2. Anaphoric vs. deictic definites

It has long been observed that definite expressions allow deictic reference to entities in the actual context, but different studies make use of the term 'deixis' differently. Some use the term 'deictic' for an entity as long as the entity is present in the context (Wolter, 2006; Heim, 1982; Heim and Kratzer, 1998), while others restrict it for cases where the speaker actually intends to point out or demonstrate an entity (Roberts, 2002; Ebert et al., 2020). In this paper, I follow the definition in the latter group, where there is a clear indication of demonstrating an entity. As shown in (5), it is often difficult to determine whether what is involved is a true deixis with a demonstration or an anaphoric reference to an already-established entity. For example, it is possible that after attending to the cat walking in, the discourse referent that corresponds to the cat has been introduced and established in the context for the speaker to refer anaphorically to it. The latter anaphoric option is what Heim (1982) assumes when she notes that definites can refer to entities introduced by context.

(5) a. (Context: a cat walks in) The cat is hungry.
b. (Context: a dog walks in) It is going to bite.

In order to clearly distinguish between deictic and anaphoric contexts, I focus on contrastive uses as in (6). If the speaker points to two different cats, the demonstrative is licensed, but the definite is not.

(6) a. That cat$_{\rightarrow}$ is happy, and that cat$_{\rightarrow}$ is not.
b. #The cat$_{\rightarrow}$ is happy, and the cat$_{\rightarrow}$ is not.

While the contrast in (6) may be seen as the failure of the uniqueness presupposition, I argue that this is a failure of the definite article to incorporate the pointing information restrictively (Ahn and Davidson, 2018; Ebert et al., 2020). Extending this to pronouns, we see that demonstrative pronouns such as *that* and *those* allow contrastive deixis in contrast to *it* (Maclaran, 1982). Animate pronouns also allow contrastive deixis as shown in (7c), though *they* shows some variation. Note that anaphorically, *they* can refer to animate and inanimate entities. In deictic uses, however, *they* is degraded with inanimate entities. For example, (7d) is felicitous if the speaker is pointing to two groups of people, but not as good if the speaker is pointing to two sets of computers.

(7) a. That$_{\rightarrow}$ is broken, and that$_{\rightarrow}$ is not.
b. ??It$_{\rightarrow}$ is broken, and it$_{\rightarrow}$ is not.
c. She$_{\rightarrow}$ is happy, and she$_{\rightarrow}$ is not.
d. ?They$_{\rightarrow}$ are {happy/broken}, and they$_{\rightarrow}$ are not.

Analyzing deixis as a restrictive incorporation of pointing information derives from intuitions of previous works. Ebert et al. (2020) show that demonstratives combine with gestures in restrictive ways while definite descriptions do not. Elbourne (2005); Nowak (2021); King (2001)

compare demonstrative descriptions to definite descriptions and argue that demonstratives carry an additional argument. Specifically, they argue that while the uniqueness operator takes just the NP argument as its restriction for definite descriptions, it takes an additional restriction for demonstrative descriptions. In Ahn (2022), the intuitions from Ebert et al. (2020) and the additional restriction view are combined: demonstratives are analyzed as realizing a binary maximality operator, so that it takes two arguments rather than one. One of the arguments is the NP while the other is a deictic 'linker' to the actual context. The main information that the linker takes is a depictive content from the actual world like location of an entity or iconic properties, but Ahn (2022) argues that clausal arguments can also be hosted in this linker position. While the grouping of depictive content and clausal arguments is not readily obvious, it aligns with the developmental path of pointing where it serves as 'proto-declaratives' and 'proto-imperatives' in language development (Bates, 1976), thus replacing entire clauses rather than just predicates.

One important consequence of this view is that deixis is no longer subsumed under the general mechanism of anaphora but derived through a separate mechanism. Under accounts that subsume deixis under anaphora, it is difficult to explain why expressions that allow anaphora do not always allow deixis. For example, the definite description is known to allow anaphoric uses, but it does not allow deictic uses as in (6b). Under this account, deictic uses are not predicted to be possible with definite descriptions because deixis requires this linker argument, and only demonstratives carry an argument slot for this linker.

Now that deixis is argued to involve a separate mechanism from anaphora, the next question is whether and how this applies to pronouns. We have already noted that pronouns vary in whether they allow deixis. Singular animate pronouns *she* and *he* allow deixis freely, while *they* has some restrictions. In contrast, *it* does not allow deictic uses altogether. I argue following Ahn (2022, 2019) that just like descriptions, pronouns have demonstrative and definite, or deictic and non-deictic/anaphoric, variants. Pronominal demonstratives *that* and *those* naturally fit into the demonstrative category, but I further argue that animate personal pronouns *she* and *he* are ambiguous between the anaphoric and the deictic categories while *it* and *they* are in the anaphoric category. The categorization is not lexically specified, but derives from competition with the demonstratives. For example, the restriction of *it* and *they* seem to come from the competition with demonstrative pronouns *that* and *those*. Because English demonstrative pronouns are often restricted to inanimate entities, the animate pronouns *she* and *he* are not constrained by them and can be used both as deictic and anaphoric kinds. For example, note that in contexts where the plural demonstrative *this* is appropriate for animate entities and thus is available as in (8a), the use of the pronoun *she* is degraded as in (8b), supporting this competition-based account.

(8) a. This$_{\rightarrow}$ is my sister, and this$_{\rightarrow}$ is my mother.
b. ?She$_{\rightarrow}$ is my sister, and she$_{\rightarrow}$ is my mother.

Further evidence for dividing the set of English pronouns into deictic and anaphoric kinds comes from the observation that the pronouns vary in their ability to host NPs and relative clauses. Note that certain pronouns can co-occur with NPs as in (9) (Postal, 1966).

(9) You troops will embark but the other troops will remain.

While examples like (9) is used in Elbourne (2005) and Elbourne (2013) to support the idea that pronouns are semantically like determiners, what is interesting is that not all pronouns support this NP-carrying uses. As the sentences in (10) show, while the first-person plural pronoun *we* allows NP restrictions, other pronouns do not.

(10) a. We linguists agree.
b. ?{He/She} linguist agrees.
c. ?It cup fell.
d. ?They linguists agree.

This seems to be due to the competition with demonstratives: while *you* and *we* do not have corresponding first- and second-person demonstratives, the others can all be replaced with third-person demonstratives *that* and *those*.

Furthermore, pronouns allow relative clauses at varying degrees. Pronouns like *he* can host relative clauses with the absence of nouns, as in (11), as discussed in Elbourne (2013).

(11) He who reads never fails.

Elbourne (2013) notes that the hosting of relative clauses is one of the strongest arguments for analyzing pronouns as definite descriptions with NP deletion. Under this view, because relative clauses are commonly analyzed as being hosted by NPs, pronouns that carry relative clauses provide evidence that there is an underlying NP. However, Elbourne notes that not all pronouns host relative clauses. For example, *it* does not host a relative clause as shown in (12).

(12) *It which rolls gathers no moss.

Zobel (2015) also notes that while *he* and *she* allow relative clauses, *they* is quite degraded in such uses. This pronoun-internal variation is considered a puzzle in Elbourne (2013), where (12) is suggested to be due to *it* not being compatible with phonological stress. However, this explanation cannot apply to the degradedness of *they*.

I argue that this pronoun-internal variation in the ability to host relative clauses can be captured by the deictic vs. anaphoric distinction in pronouns and the competition with deictic demonstratives. Note that the variation resembles the variation we saw with the contrastive deictic uses of pronouns. Following Ahn (2022), I assume that the linker argument of a demonstrative can also host relative clauses. Because the linker argument is outside the NP restriction under this account, the presence of an underlying NP is not relevant to the ability to host a relative clause. Instead, what matters is which of the pronouns can be used deictically. Because English *it* and *they* are not deictic and do not allow this linker argument, the degradedness of relative clauses with these expressions is readily predicted.

Thus, in this section, I have proposed to move away from the general assumption of subsuming deixis under the mechanism of anaphora and deriving it through a separate mechanism. The analysis I adopt is that of Ahn (2022) where deictic expressions carry an additional linker argument that is specified to be a deictic pointing or a clausal argument. I show that this deictic vs. anaphoric distinction divides English pronouns into two categories, which resolves Elbourne's puzzle in the original D-type theory, namely that only certain pronouns host relative clauses. Under the current proposal, relative clauses are hosted by pronouns not through a hidden NP but through the linker argument, and thus non-deictic pronouns that lack this linker argument are correctly predicted to disallow contrastive deixis and relative clauses.

3. Pronominal vs. descriptive definites

Now that the deictic vs. non-deictic distinction in English pronouns is motivated, I move on to discuss the difference between pronominal expressions and descriptive expressions. Unlike the deictic vs. non-deictic distinction, I argue that there is no structural difference between pronominal and descriptive expressions. They share the same exact structure, either the deictic one with the linker or the non-deictic one without, and only differ in the amount of content they carry: pronominal expressions simply carry ϕ-information while descriptive expressions carry the NP information. Thus, in this account, the semantic contributions of a pronoun's ϕ-features and a definite description's NP are exactly the same.

Gutzmann and McCready (2014) argue for a multidimensional analysis for definite descriptions, where their propositional content and the user-conditional content are distinguished. Truth-conditionally, all that the definite description returns is the relevant entity, while use-conditionally, it requires the referent to meet the NP property. In doing so, they draw a parallel to pronouns, where pronouns look the same except what they require use-conditionally is their ϕ-requirements. In support of this view, I provide evidence that the gender information of a pronoun and the NP description of a definite description have the same presuppositional nature. Specifically, I review the presuppositional nature of pronouns' gender inference as discussed in previous works and show that in anaphoric uses, the NP content of a definite description has the same exact properties. This motivates a fully parallel account of the two, which is what I present in the next section.

3.1. NP vs. gender information

The ϕ-features of a pronouns are generally assumed to be presuppositions (Sudo, 2012). I discuss the different characteristics identified for the gender inference of a pronoun and show that the NP inference of a definite description, namely that the given entity is in the set denoted by the NP, looks the same. In doing so, I will follow the arguments in Sudo (2012) closely, as this work provides a wide range of expected and unexpected properties of the gender inference. Throughout this paper, I focus on gender information that have semantic consequences, and leave other ϕ-features such as number and person aside (see Sauerland, 2008; Kratzer, 2009; Sauerland et al., 2005: for more discussion). The goal of this paper is not to evaluate whether the gender inference of a pronoun should be analyzed as a presupposition or not, but to show that the NP inference of a definite description behaves exactly like the gender inference.

3.1.1. ϕ-features as presuppositions

One of the defining characteristic of a presupposition is that it is not straightforwardly rejectable. This applies to the gender inference of pronouns as we see in (13), where rejecting the truth of this sentence does not reject the assumption that the agent is female.

(13) She$_7$ is drinking coffee.
  a. No that is not true. (*does not mean*: g(7) is not female.)

This presupposition is maintained in quantified contexts as well. In (14), what is presupposed is that every kid is female, and this does not get rejected if the sentence is false.

(14) Every kid drank her coffee.

Another defining characteristic of presuppositions is their projection behavior. In (15), adopted from Sudo (2012), the attitude holder of the sentence is implied to believe the gender inference of the phonologist.

(15) Kate said that John attended a talk by some phonologist. We have no clue whether or not she's telling us the truth. Kate believes/doubts/hopes that John criticized her. (attitude holder is implied to believe the gender inference) (Sudo, 2012: 25)

Gender features of a pronoun also show local accommodation. Local accommodation is shown with the presupposition trigger *stop* in (16a). While Sudo (2012) notes that local accommodation for gender inference is much harder, it is possible with prosodic stress, as in (16).

(16) a. Rafael did not stop using Mac, because he never owned a Mac. (Sudo, 2012: 24)
b. #I don't know her personally, because he is a man. (Sudo, 2012: 24)
c. I don't know HER personally, because he is a man.

Sudo (2012) notes that, unlike the presupposed content of the trigger *stop*, gender inference of a pronoun is not part of the asserted content. Consider (17) as an example. What (17) means is that exactly one student used to use Mac and no longer does. As for the others, the sentence requires that they either never used Mac or are still using it, thus showing that the presupposition that the student used to use Mac is part of what is negated.

(17) Exactly one student stopped using Mac. (Sudo, 2012: 59)

On the other hand, the gender inference of a reflexive pronoun *herself* in (18) is not part of the negation. Here, (18) means that only one student criticized their self and is female. The sentence also asserts that no one else, female or not, criticized themselves. Unlike (17), it does not mean that either they are not female or did not criticize themselves.

(18) Exactly one student criticized herself(, namely Mary) (Sudo, 2012: 61)

Sudo (2012) presents an analysis of pronouns that maintain their gender inference as presuppositions and accounts for the exceptional characteristics. Leaving the details aside, I assume that the gender inference of pronouns is presupposed. In the following section, I show that these properties hold of the NP restriction of a definite description as well.

3.1.2. NP restriction as presuppositions

We now go over the properties listed in the previous section and compare them to the NP inference of the definite description. First, we see that the NP inference is not straightforwardly rejectable when used with a definite description, as in (19). For example, even if the addressee rejects the two sentences in (19), the addressee is not rejecting the fact that the relevant individuals are linguists (see also Gutzmann and McCready (2014)).

(19) a. The linguist is drinking coffee.

b. Every linguist drank the coffee that the philosopher made for the linguist.

We also see that the NP inference projects, as shown in (20). Here, the attitude holder is implied to believe that the person is a phonologist.

(20) Kate said that John attended a talk by some linguist. We have no clue whether or not she's telling us the truth. Kate believes/doubts/hopes that John criticized the phonologist.
(attitude holder is implied to believe that the person is a phonologist)

The NP inference can also be locally accommodated. Just as prosodic stress on *her* highlights the gender property which then can be rejected in subsequent discourse, prosodic stress on the noun highlights the NP property which then can be rejected. This is shown in (21).

(21) a. #I don't know the linguist personally, because she is a philosopher/not a linguist.
b. I don't know the LINGUIST personally, because she is a philosopher.

Similar to gender inference and different from presuppositions of *stop*, the NP inference is also not part of the asserted content. This is much harder to detect for descriptions because of binding restrictions, but we can come up with a variable-bound reading of a definite, which we know is possible from works like Elbourne (2013), Schlenker (2005), and Schwarz (2009). Consider the discourse in (22). When the question under discussion (QUD) is set properly for a bound reading, the NP inference of the definite description *the student* is not part of the asserted content. For example, this sentence means that only one student complained, and is a student, and that no one else, student or not, complained. It does not mean that for others, either they were not students or did not complain. To get this reading to be prominent, we need broad focus on both *one* and *student* (Uli Sauerland, p.c.), or specify the student as 'one particular student' or 'this one student' to ensure a referential reading rather than a quantified reading.

(22) QUD: Did anyone from the conference complain about the poster dimension?
Only ONE STUDENT complained that the poster dimensions provided by the conference were not compatible with what the student prepared.

In summary, what we see is that in anaphoric uses, the NP restriction of a definite description makes the same contribution as the ϕ-features of a pronoun: providing a presupposition that the entity under discussion meets a certain property. The only difference is that what a pronoun requires of the entity is that the entity meets one of a few grammatically-determined set of properties such as gender or animacy, while the requirement of a definite description is more flexible given the wide range of NPs that can be used. Semantically, however, the contribution is the same. This presupposition can remain backgrounded, or become at-issue and thus locally accommodated with appropriate prosodic marking, but remain not part of the asserted content otherwise.

4. Analysis: a four-way distinction

In the last section, I motivated two divergences from Elbourne (2013). The first was a distinction internal to pronouns that corresponded to deictic and anaphoric kinds. The motivation for this was that not all pronouns allow deictic reference or hosting of relative clauses. By deriving

deixis not from anaphora but from a linker argument of a demonstrative, I showed that only demonstrative pronouns, namely animate pronouns such as *he* and *she*, are correctly predicted to allow deixis and to host relative clauses. Definite pronouns that lack the linker argument were correctly predicted to disallow such uses. The second divergence was removing the difference between pronouns and definite descriptions in Elbourne (2013), namely in that pronouns presuppose ϕ-features. I showed through a comparison of properties of the gender inference of a pronoun and the NP restriction of a definite description that the semantic contribution of the two kinds of information are the same.

Based on this, I propose a uniform analysis of pronouns and definite descriptions that a) distinguish deictic and anaphoric uses and b) treat ϕ-features on par with NP restrictions.

The distinction between deictic and anaphoric pronouns results in a four-way distinction in definite expressions along two dimensions. The first dimension is anaphoric vs. deictic, where the difference is that the latter has an additional linker argument that can host deixis or relative clauses. The second dimension is the content of the restriction where pronouns carry ϕ-requirements and descriptions carry NP restrictions.

As for the denotations, I adopt the analysis in Ahn (2022), whose denotations are shown in (23). In the anaphoric expressions *it* and *the book*, a supremum operator is used to take restrictions and return a unique entity that meets those restrictions. For the demonstrative expressions, the binary supremum take an additional restriction. The denotations in (23c) and (23d) show deictic uses of *that* and *that book*, respectively, where the speaker points to some location A. The predicate $\rightarrow (A)(x)$ is true iff x is located at A.

(23) a. $[\![\text{it}]\!] = \text{sup}[\lambda \text{x.inanimate(x)}]$
b. $[\![\text{the book}]\!] = \text{sup}[\lambda \text{x.book(x)}]$
c. $[\![\text{that}_{\rightarrow \text{A}}]\!] = \text{bi-sup}[\lambda \text{x.inanimate(x)}][\lambda \text{x.}\rightarrow\text{(A)(x)}]$
d. $[\![\text{that book}_{\rightarrow \text{A}}]\!] = \text{bi-sup}[\lambda \text{x.book(x)}][\lambda \text{x.}\rightarrow\text{(A)(x)}]$

Note that in (23), the contribution of the gender inference of pronouns and that of the NP inference of definite descriptions are the same: they both serve as restrictions to the supremum operator. These denotations are sufficient to derive the similarities between pronouns and descriptions, but there is an additional distinction that needs to be made between this restriction (gender or NP) and the restriction added by the linker. As we saw in Section 3.1, the gender and NP restriction of a pronoun and a definite description, respectively, were backgrounded. The backrounded nature of gender inference is what motivates a presuppositional analysis of gender inference (Sudo, 2012) and the use-conditional analysis of NP and ϕ (Gutzmann and McCready, 2014). On the other hand, the linker argument seems to be never backgrounded always at-issue. Ebert et al. (2020) specifically argue that the role of demonstratives is to make the pointing at-issue, analyzing demonstratives as 'dimension-shifters', that shift the originally not-at-issue information of the pointing gesture to at-issue. Adopting this intuition, I argue that the linker argument should be at-issue by default while the description is not-at-issue by default. I further extend the at-issue analysis of Ebert et al. (2020) by arguing that what is at-issue is not just the pointing gesture but anything that is hosted by the linker argument of a demonstrative. Consider (24) from Wolter (2006) for example. Wolter (2006) notes that the intended reading of (24) requires the prosodic stress on the relative clause as indicated by brackets and capitalization.

(24) [THAT hero] [who KILLS the dragon] [will INHERIT the kingdom].

What we observe is that the content of the relative clause is at-issue, while the referent of the entity that meets the relative clause is not. The resulting interpretation is similar to a free relative: *whoever* kills the dragon will inherit the kingdom. In other words, it is the content of the relative clause that entails the content of the VP rather than the entity itself. This is also supported by a modified example in (25), where the content of the two relative clauses are what entail the content of the respective VPs, and there is no specific entities that the speaker has in mind.

(25) That hero WHO KILLS THE DRAGON will become the king, and that hero WHO FINDS THE DRAGON will become the next king.

Combining the two intuitions, the two dimensions in which definite expressions differ are formalized as follows. The deictic and non-deictic difference is encoded by the presence and the absence of an at-issue linker restriction. Demonstrative pronouns and demonstrative descriptions carry a linker restriction that definite pronouns and description do not. The pronominal vs. descriptive distinction is made in the content carried in the presupposition: pronominal expressions presuppose ϕ-features while descriptive expressions presuppose NP restrictions. The proposed denotations are shown in (26).

(26) a. $[\![\text{it}_i]\!]^g = \iota x{:}\phi(x).x{=}g(i)$
b. $[\![\text{the book}_i]\!]^g = \iota x{:}\text{book}(x).x{=}g(i)$
c. $[\![\text{that}]\!]^g = \lambda y.\iota x{:}\phi(x).R(x,y)$
d. $[\![\text{that book}]\!]^g\ \lambda y.\iota x{:}\text{book}(x).R(x,y)$

The main novelties of the current proposal is that non-deictic pronouns and descriptions are analyzed against the assignment function and simply returns the entity that carries the given index, which could also be abstracted later in the derivation for quantificational binding. The contribution of the ϕ and the NP information are presuppositions added to the entity. Analyzed this way, the pronoun does not differ from common assumptions. What is different is that a definite description has the same exact denotation except with an NP presupposition rather than a ϕ presupposition.

The deictic expressions, however, do not simply return the entity from an assignment function, and instead takes an additional argument y and returns the unique entity that stands in some relevant relation R with y. For example, a deictic use of the pronominal *that* would take a location variable for y and return the unique entity x such that the 'located-at' relation holds between x and y. For *that* hosting a relative clause such as *that which rolls*, y would have to be a clausal argument, with R denoting a 'defined-by' relation. While I leave the possibilities of y and R open here, it is possible to constrain them further as in Ahn (2022). There might also be language-specific constraints for which kinds of relations are denoted by which demonstratives: not every language allows deictic demonstratives to host relative clauses, restricting them for only deictic reference (Ahn, 2017). Yu (2023) argues that Mandarin demonstratives should also be able to take prepositions and names as arguments in addition to locations and clausal arguments. How the parameters of deictic demonstratives are further constrained is left for future investigation.

I elaborate further on the idea of a definite description carrying NP presupposition. Generally,

definite descriptions are analyzed as carrying uniqueness and/or existence presuppositions (cf. Coppock and Beaver (2015) for an analysis of English *the* as lacking an existence presupposition). Gutzmann and McCready (2014) argue instead that the contribution of the NP and the gender content should be located in the use-conditional dimension, where they simply require the referent to meet the descriptive information. Thus, in famous misdescription contexts as in (27) from Donnellan (1966) where the speaker mistakes someone for drinking a martini, the NP content does not affect the propositional content. Instead, all it does is check whether the entity returned by the definite description meets that description at the user-conditional dimension.

(27) The man drinking a martini is tall. (Donnellan, 1966)

While the formal details differ, the argument in this paper is fully parallel to that of Gutzmann and McCready (2014). Instead of analyzing the misdescription in (27) as a presupposition failure, where the presupposition that is not met is the *existence* and the *uniqueness* of a man drinking a martini, I argue that the presupposition that is not met is that of the NP content: namely that the entity in question *is* a man drinking a martini. Describing this context as a case of an NP presupposition failure rather than a case of existence and uniqueness presupposition failure does not change the resulting interpretation. Moreover, analyzed this way, we have a full parallelism with the oddity that results when a speaker mistakenly uses a female pronoun for a given entity when the conversation participants are aware that the entity is male and uses masculine pronouns.

One important consequence of this analysis is that all definite expressions are seen as either anaphoric or deictic. There is, for example, no separate denotation for definite descriptions that are solely based on uniqueness, as there is in Schwarz (2009). For this, I adopt the intuition from the familiarity theory of definites as in Heim (1983) and Roberts (2003), assuming that definites always refer to something that is familiar to the conversation participants. Specifically following Roberts (2003), I assume that when familiarity is not met, uniqueness is implicated through conversational expectations, accounting for the use of definite expressions in non-familiar contexts (see Köpping (2020) for a more recent attempt to subsume uniqueness under familiarity).

4.1. Accounting for the differences

Despite the uniform analysis proposed and the many similarities observed above, the question remains as to why pronouns and definite descriptions differ so much. For example, we rarely see pronouns used attributively while definite descriptions are used attributively very frequently. Also, gender information, which seems conventionalized and grammaticalized, seems to be fundamentally different from NP information which is lexical and arbitrary.

While this distributional difference is real, they don't necessarily challenge the view that pronouns and definite descriptions are parallel in their underlying semantic structure. Note that under this analysis, pronouns and definite descriptions still do differ in the presupposition content: pronouns presuppose ϕ-information while definite descriptions presuppose NP information. I argue that this difference is sufficient to account for the distributional differences. Consider the first difference that definite descriptions seem to be used attributively much more often than

pronouns. Attributive uses of information are licensed when the information is helpful in disambiguating interpretation. It seems natural that an NP would be more helpful in disambiguation than gender, which can only divide the set of possible entities into a few classes depending on the language inventory. Moreover, attributive uses of pronouns are indeed possible, when gender is sufficiently informative. Consider for example the sentence in (28), where the gender information of the two pronouns are sufficient to distinguish the two guests in discussion.

(28) Every time I invite a man and a woman, he brings the flowers and she brings the wine.

Thus it seems more economical to assume that pronouns and definite descriptions are parallel in their semantic structure but the difference in the rate of attributive uses is due to the fact that NPs help identify the intended referent out of alternatives more readily than gender information.

The second difference is that gender information is much more conventionalized than lexically specified NPs. This difference is simply a reflection of the difference in the content, and thus not problematic for the analysis. However, analyzing pronouns and definite descriptions as only differing in the conventionalization rate of the presupposed content does result in an interesting prediction that pronouns are special definite descriptions that develop after definite descriptions. This prediction does not seem to be met on the surface given that many languages make use of pronouns and lack definite determiners. However, if we consider the fact that even in those languages bare nouns can be used to refer anaphorically to a familiar entity, the pattern does seem to hold. Across languages, anaphoric reference with nouns (with or without determiners) is possible, but not every language has pronouns that are morphologically independent from nouns. Many languages instead make use of demonstrative descriptions that contain lexical or conventionalized nouns such as *thing* and *human* (Ahn, 2019). Of course this is not necessarily claiming that pronouns always develop out of nouns through conventionalization. However, this seems to be compatible with the current state of many languages that do not have separate pronouns and instead a limited set of demonstrative descriptions with (conventionalized) nouns such as Korean, Japanese, and Turkish. For example, in Korean, a morphologically-complex expression that contains a demonstrative and the noun *ay* (‘kid’) phonologically reduced to a single syllable is often used like a pronoun in the informal register.

(29) *kyay*: *ku* (demonstrative ‘that’) + *ay* (NP, ‘kid’)
  a. Ecey kyay pwa-ss-ta.
  yesterday her see-PAST-DECL
  ‘I saw her yesterday.’

In Japanese, the pronouns make use of a demonstrative accompanied by a small set of nouns indicating people. For example, (30a) combines the demonstrative with a free morpheme *hito* (‘person’), while (30b) combines the demonstrative with a bound morpheme *itsu* meaning ‘guy’, which is not a free morpheme in the language.

(30) a. a/so-no hito
  DEM-GEN person
  ‘that person’
  b. ko/a/so-itsu
  DEM-guy
  ‘this/that guy’

Leaving aside the diachronical prediction of this analysis, what we can conclude is that the difference between gender information and NP information seems to be a language-specific development that can differ across languages. Some languages make use of animacy distinction but not gender distinction for their pronouns as in Thai or Mandarin.

5. Conclusion

In this paper, I have argued for a four-way distinction in definite expressions. While maintaining the intuitions of previous accounts that have considered pronouns, definite descriptions, and demonstratives in a uniform way, this analysis makes two important divergences. The first is in semantically distinguishing the mechanism in which deixis and anaphora arise. Deixis is realized through a separate linker that deictic expressions carry as additional arguments, while anaphora is realized through indexing. Pronouns are argued to be ambiguous between deictic and non-deictic types, which resolve a puzzle presented in Elbourne (2013). The second is in semantically equating the contribution made by gender information of pronouns and the NP information of descriptions. Both kinds of information are shown to be backgrounded and presupposed, with the ability of being prosodically stressed and highlighted for local accommodation. The final analysis places the NP and the gender information in the presupposition and the deictic linker argument in the restriction of an ι operator. I argue that the distributional differences – specifically where attributive uses of pronouns are much more restricted – are simply due to pragmatics of informativity rather than semantic differences.

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