

## On direct reference and perceptually grounded descriptions

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This paper examines identity questions which inquire about the identity of a person, as in (1).

- (1) a. Who is the violinist?
- b. Who is the man on the left?

Because of auxiliary movement, in matrix questions it is not possible to determine whether the (wh)-word originates in the pre-or post-copular position, which in turn, means that it is unknown if the definite description is in the pre or post-copular position. To avoid this issue, we will focus on embedded identity questions, as in (2)-(3).

- (2) a. Who do you think the violinist is \_ ?
- b. Who do you think the man on the left is \_ ?
- (3) a. Who do you think \_ is the violinist?
- b. #Who do you think \_ is the man on the left?

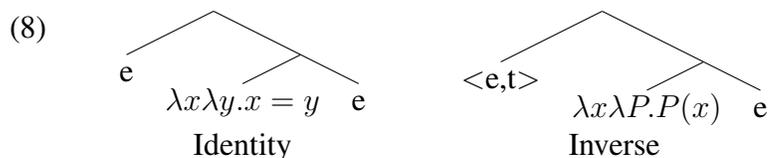
These embedded questions reveal an interesting contrast that was not apparent in (1): while *the violinist* is possible in both positions, this is not the case for *the man on the left*, which sounds odd in the post-copular position. The goal of this paper is to account for this contrast: we analyze these identity questions as predicational and explain why *the man on the left* cannot be a predicate while *the violinist* can.

The paper is organized as follows. In the next section we show that questions like (2)-(3) are predicational, in the sense of Higgins (1973). In section 2 we introduce data showing that the contrast in (3) is fundamentally pragmatic, as it depends on the interlocutors' perceptions of the physical context of utterance. We introduce the notion of "perceptually grounded" descriptions, and argue that these descriptions are directly referential, as proposed by Kaplan (1989a,b) for demonstratives. In section 3 we argue that directly referential expressions cannot be predicates because they do not undergo the Partee's (1986) IDENT type shifting rule. In section 4 we consider the implications of our proposal to the analysis of proper names.

Our analysis has significant implications beyond identity questions. First, we show a previously unrecognized constraint on semantic composition: not all definite descriptions make acceptable predicates. Second, we argue that under some pragmatic conditions certain definites are directly referential, a mode of reference which has previously been assumed to arise only from certain lexical items, like demonstratives.



Specificational sentences are not as well understood. Two main lines of analysis have been proposed: one which takes specificational sentences to be identity sentences (e.g. Heller 1999, Heycock and Kroch 1999, 2002) and one which analyzes specificational sentences as cases of inverse predication (originally due to Williams 1983; see also Moro 1997 and Mikkelsen 2004). The two lines of analysis are illustrated in (8). Specification as identity uses a “BE of identity,” and specification as inverse predication follows Partee’s (1986) analysis which uses the same “BE of predication” as predicational sentence, with the opposite order of arguments.



With this background in mind, let us return to sentences (2)-(3) and consider what type of copular sentences these identity questions exemplify. As we saw above, intuitions about meaning do not always clearly distinguish predicational and specificational sentences, and it is therefore necessary to consider other properties of these two classes of specificational sentences.

## 1.2 Diagnosing identity questions

The binding facts we saw above cannot be applied to identity questions to test whether they are predicational or specificational. The diagnostic we will use for this purpose is the extraction itself, as it has been known since Higgins (1973) that specificational sentences are inert with respect to movement. That is, while predicational sentences allow for *wh*- and other kinds of extraction, specificational sentences do not. As a result, ambiguous sentences like the ones we saw above become unambiguously predicational if a constituent is extracted. For example, when the post-copular phrase is extracted out of the ambiguous (9-a), the sentence in (9-b) is unambiguously predicational.

- (9)
- |    |                                |    |     |
|----|--------------------------------|----|-----|
| a. | What John is is important.     | pr | sp  |
| b. | How important is what John is? | pr | *sp |

Higgins (1973) further shows that the pre-copular phrase cannot be moved from a specificational sentence. This is illustrated using a raising construction in (10). The ambiguous (9-a) becomes unambiguously predicational in the raising construction in (10-b). Further, if we apply raising to the unambiguously predicational (5-a), we get the grammatical (10-c), but for the specificational (5-b), this results in the ungrammatical (10-d).

- (10)
- |    |  |    |     |
|----|--|----|-----|
| a. | What John is is important                  | pr | sp  |
| b. | What John is seems to be important.        | pr | *sp |
| c. | What John is seems to be important to him. | pr |     |



For the analysis of demonstratives, we follow the classic work of Kaplan (1989a,b). Kaplan observed the close connection demonstratives have with the physical context of utterance, and thus analyzed demonstratives as directly referential. Kaplan explains that

directly referential expressions are said to refer directly without the mediation of a Fregean Sinn. What does this mean? . . . the relation between the linguistic expression and the referent is not mediated by the corresponding propositional component, the content, or what-is-said (1989b, p. 568).

The intuition here is that while the denotation of other referring expressions is determined by the truth-conditional compositional semantics, the denotation of a demonstrative is determined by contextual factors such as speaker demonstrations or referential intentions. Kaplan argues that these contextual factors are pre-propositional; at the level at which the truth-conditional semantics of a sentence is computed, only the actual referent of a demonstrative is available.

If (14) is a predicational sentence, and *that man* is directly referential, that suggests that directly referential expressions cannot function as predicates. The idea that directly referential expressions cannot function as predicates is central to our analysis, and we return to the implementation of this proposal in section 3. First, however, let us consider how the approach we have just sketched for (14) can be applied to (12).

Kaplan himself applied the direct reference analysis to demonstratives and indexical expressions such as *I*, *here* and *now*. The definite description *the man on the left* is not strictly indexical. However, this description does have a close connection to the physical context of utterance: in the unmarked context, the addressee must use his or her perceptions of the physical surroundings in order to determine which man has the property of being on the left.

It is this dependence on the addressee's perception of the physical context of utterance that determines which definite descriptions are acceptable in the post-copular (i.e. predicative) position of questions like (12). We can see this by changing the context in which (12-b) is uttered. The unmarked context in which (12-b) would be uttered is one where there are two (or more) people standing in front of the interlocutors. In this context, *the man on the left* contains a property that is perceived and the question is infelicitous. What happens if we change the context such that the man on the left is no longer perceived? Consider a context of a game or some competition, where the two men are standing behind two doors. This change to the context is sufficient to make (12-a) felicitous. Note that what changes the status of (12-b) is not simply whether the referent is perceived, but rather whether there is a property description which is perceived as holding of the referent. This can be illustrated by examining (12-a). The unmarked context would be the one where two men stand in front of the interlocutors; in this context, the violinist, i.e.

the referent, is perceived, but the property used in the referring expression is not perceived, and the question is felicitous. Compare this with a context where these men are members of a trio, and they are holding their instruments preparing to get on stage: (12-a) can no longer be used to inquire about the identity of the person in question, and becomes infelicitous just like (12-b). This shows that the acceptability of definite descriptions in post-copular position of identity questions is associated with the pragmatic relationship between the content of the definite description and the physical context of utterance, rather than being tied to a certain lexical item like *that* or *left*.

Example (12-b) is crucially different from (12-a) in that the former contains a lexical item which is inherently perceivable (*left*), but the latter does not (*violinist*). So the fact that both are infelicitous when the description is linked to a perceived property and felicitous when it is not, indicates that the phenomenon we are considering here is not tied to lexical items that encode perceived properties, but rather arises from uttering a referring expression in a particular context. We will call descriptions that are linked to perceived properties *perceptually grounded*. Note that perceptual grounding does not simply depend on the property being perceivable; the property has to be assumed as perceived by the interlocutors in the context of utterance. This can be illustrated by going back to (12-b) and considering it in a context where the addressee is a four-year-old. Here the goal can be finding whether the child can tell left from right. In this context, (12-b) is felicitous. The young addressee can perceive the referent of *the man on the left*, but crucially we do not assume that the addressee verifies the property of being on the left by using his or her perceptions of the physical context.

Our collected observations about (14) and (12) lead us to propose that directly referential expressions cannot function as predicates, and furthermore that perceptually grounded descriptions are directly referential. This has the important implication that direct reference is not always triggered by specific lexical items, but may also be caused by the interaction of descriptive content, the physical context, and the interlocutors' epistemic states.

It should be noted that we are not arguing here with Kaplan's intuition that certain lexical items (demonstratives and indexicals) trigger direct reference.<sup>2</sup> In fact, (14) remains infelicitous even in contexts where the referent of *that man* is not perceived by the interlocutors, suggesting that the demonstrative is directly referential regardless of which properties are perceived by the interlocutors. Our argument is that the pragmatic phenomenon perceptual grounding is an additional trigger of direct reference.

It might seem at this point that we have shown that the identity of the man on the left cannot be asked about when it is already in common ground and the identity

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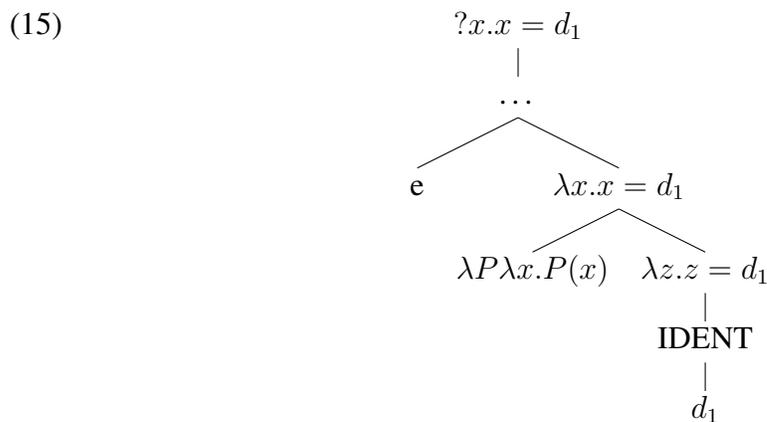
<sup>2</sup>Several researchers have recently argued, however, that not all demonstratives are directly referential (King 2001, Roberts 2002, Wolter 2006). Even indexical pronouns have been argued to have non-indexical uses (Kratzer 2009).

of the violinist cannot be asked about if it is in common ground. That would hardly be surprising. It is therefore important to point out that the puzzle we're aiming to explain is why this pattern exists when this information is in predicative position in (12), and the same issue does not arise when the same descriptions are in the pre-copular position, as in (11). So it is not the case that we cannot ask about the identity of the man on the left because we can see that he is the man on the left, but rather we cannot ask about his identity with using a perceived description in predicative position. We now turn to the question of what goes wrong with the formal composition when a directly referential expression occurs in predicative position in an identity question.

### 3 Directly referential expressions as predicates

#### 3.1 The role of IDENT

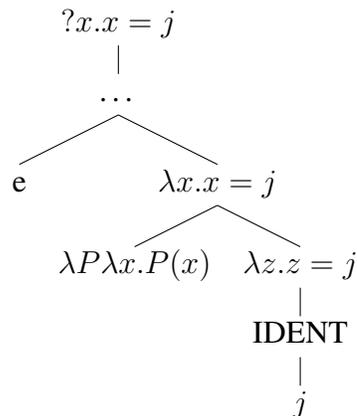
Let us examine the composition of (14) and (12-b) under the direct reference analysis, as shown in (15) (for expository purposes, we will use (12-b) on its perceptually grounded reading and (12-a) on its non-perceptually grounded reading). The direct reference analysis of demonstratives and perceptually grounded descriptions takes them to denote an entity — the referent — at the level at which the truth-conditional semantics are composed; at this level these expressions do not have internal structure with descriptive content. Since an expression of type *e* cannot compose with the BE of predication, we might expect the expression to be lifted to type  $\langle e,t \rangle$  via IDENT, just like we saw for the denotation of *the violinist* in (13). At the sentence level, the question would then be asking who is the individual that is identical to  $d_1$ .



But (14) and (12-b) are infelicitous. So why is this composition not possible? This is especially surprising if we consider the very similar composition of (16) in (17), noting that (16) is perfectly acceptable.

(16) Who do you think \_ is John?

(17)



We propose that directly referential expressions cannot be shifted by IDENT. Before we provide further evidence for our proposal, let us review Partee’s original discussion of IDENT.

In her original work on type shifting, Partee (1987) expects her type shifting rules to apply without restriction to all expressions that have the relevant input type: “all NPs in principle have an  $\langle e,t \rangle$  interpretation, but some of them (like *every island*, *most islands*) yield unsatisfiable or otherwise degenerate predicates” (pp.119-120). Nonetheless, it should be noted that Partee herself does not discuss definite descriptions and demonstratives in the predicative position of copular sentences. Her example of the range of possible predicates, shown in (18), does include proper names, though:

(18) John is {tall / in the room / a professor / Mr. Smith / mayor of Cambridge}

Furthermore, Partee notes that  $\langle e,t \rangle$  is the marked type for full noun phrases, so if we were to expect any restriction on type shifting, it would be a type shifting rule that shifts a nominal from an unmarked type like  $e$  or  $\langle \langle e,t \rangle, t \rangle$  to the marked type  $\langle e,t \rangle$ , as IDENT does.

### 3.2 Perceptually grounded description in copular sentences

If the reason (14) and (12-b) are unacceptable is that IDENT does not apply to directly referential expressions, we should observe this in other predicational sentences, not just in identity questions. That is, our proposal makes the prediction that demonstratives and perceptually grounded definite descriptions should not be acceptable in predicational sentences overall. This prediction is borne out.

First, the prediction is consistent with Higgins’ (1973:299) observation that if we replace the indefinite in the ambiguous (19-a) (repeated from (6)) with a demonstrative as in (19-b), the sentence becomes unambiguously specificational. This is exactly what we would expect given our proposal that directly referential expressions cannot function as predicates.

- (19) a. What I am pointing at is a kangaroo. pr sp  
 b. What I am pointing at is that kangaroo. \*pr sp

The same is observed with perceptually grounded definite descriptions. Consider (20) with *the man on the left* in post-copular position.

- (20) What I am pointing at is the man on the left.

In order to examine whether this sentence has a predicational reading, we apply two of Higgins's (1973) tests for distinguishing predicational and specificational sentences. Example (21-a) demonstrates that if we coordinate two copular sentences that are each ambiguous between a predicational and a specificational reading, and delete the second copula, only the predicational reading is still available. Example (21-b) demonstrates the same effect for the deletion of the post-copular phrase.

- (21) a. What John is is important, and what Mary is interesting. pr \*sp  
 b. What John is is important, and what Mary is is too. pr \*sp

Our prediction about the sentence of interest (20) is that it does not have a predicational reading because the post-copular phrase is a perceptually grounded description. If this prediction is correct, then (20) will be unacceptable in coordinate deletion structures like (21), which allow only predicational readings. Example (22) shows that this prediction is borne out.

- (22) a. \*What I am pointing at is the man on the left, and what you are pointing at the man on the right.  
 b. \*What I am pointing at is the man on the left, and what you are pointing at is too.

The examples in (19-b) and (22) thus provide support for our proposal that IDENT does not apply to directly referential expressions.

#### 4 A note on proper names

We are left with a final loose end, concerning the status of (16). If we follow Kaplan (1989a,b), who suggested that proper names are directly referential (after Kripke's 1982 influential analysis), we predict (16) to be unacceptable, just like (12-b) and (14). But we have seen that (16) is perfectly fine, so if our analysis is correct, proper names are not directly referential, and IDENT can apply to them. We also expect proper names to be possible predicates in all predicational sentences, not just in identity questions. This prediction is borne out. Unlike what we saw in the previous section for demonstratives and perceptually grounded definite descriptions, (23) shows that proper names are possible in predicative position. In particular, both diagnostics of the deletion of the copula in (23-b) and the deletion of the post-

copular phrase in (23-c) indicate that *John* in the first conjunct is a predicate, and the sentence in (23-a) is predicational.

- (23) a. The person I am pointing at is John  
b. The person I am pointing at is John, and the person you are pointing at Bill.  
c. The person I am pointing at is John, and the person you are pointing at is too.

We therefore depart from Kaplan and assume that proper names are not directly referential. In fact, Percus (2003) discusses identity questions with proper names like (16), and concludes that proper names in predicative position are predicates. But for Percus, proper names in predicative position are non-rigid, contra Kripke (1982). This, we argue, is not a necessary outcome: it is possible for proper names to be not directly referential and still maintain rigidity. For example, in her work on conceptual covers, which also includes an analysis of identity questions, Aloni (2001) takes proper names to refer indirectly via individual concepts. Similarly, in our own analysis of *-ever* free relatives (Heller and Wolter 2008), we have argued that proper names (like common nouns) denote sorts in the sense of Gupta (1980): sets of individual concepts. Importantly, both Aloni's and our analysis preserve rigidity for proper names. In short, our analysis here, in which proper names do not refer directly, is consistent in principle with a Kripkean analysis of names as rigid designators.

## 5 Conclusions

We began this paper with the novel empirical observation that not all definite descriptions can occur in the post-copular position of an (embedded) identity question. We showed that this restriction depends on the pragmatic phenomenon of “perceptual grounding:” the descriptions banned from this position are such that a property in the description is perceived by the interlocutors to hold of the referent. We established that this restriction has to do with the description occurring in predicative position by showing that the same expression can felicitously occur in the pre-copular position of an identity question. After determining that the identity questions under consideration are predicational structures, we analyzed the infelicitous questions by proposing that directly referential expressions cannot function as predicates because they cannot undergo the IDENT typeshift. This proposal is novel in that it has been standardly assumed that typeshifting rules are unconstrained. It should be noted that if such constraints indeed exist, they would be expected for typeshifts from an unmarked type to a marked type, which is exactly what IDENT does to NPs, shifting them from *e* to  $\langle e,t \rangle$ .

Our analysis has important implications that go beyond the interpretation of embedded identity questions and are relevant to all uses of referring expressions. First,

our analysis suggests that direct reference is not merely a lexical phenomenon, as originally proposed by Kaplan (1989) for demonstratives and indexicals. Instead, we propose that direct reference is a pragmatic phenomenon, more widely available in natural language. Further research on the use of a wide range of referring expressions should investigate in more detail which referring expressions can receive a directly referential interpretation.

Second, we concluded based on our analysis that proper names are not directly referential, as assumed by Kaplan. It should be pointed out in this context that Kaplan acknowledges that it is possible to maintain rigidity for proper names, as originally proposed by Kripke, even without an analysis of direct reference. Aloni's (2001) work on conceptual covers and our own work on *-ever* free relatives (Heller & Wolter 2009) both have proper names as denoting individual concepts. Future work should explore the implications of such analyses to the denotation of proper names in a wider range of constructions.

Finally, this work illustrates the deep influence of interlocutors' perceptions of their physical surroundings on natural language semantics. In particular, the analysis shows that pragmatic phenomena may determine the semantic type and therefore combinatorial possibilities of some expressions. We argued that direct reference can arise as a result of a certain relationship between the referring expression used, the state of the physical context and the knowledge state of the interlocutors (or the common ground). We have proposed that this relationship is one of "perceptual grounding," where a property in the description is a perceived property of the referent. Further research should address how this concept plays out in other uses of referring expressions.

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