# Definite expressions with and without deixis

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## 1. Introduction

Reference in language generally involves two main ingredients: the grammatical description and a way to link that description and the intended referent. Sometimes, this link is overtly given by gestural or linguistic content. At other times, the intended referent can be so salient that neither element needs to be overtly produced. This paper investigates definite expressions in the nominal domain that make use of these elements in different combinations. Focusing on definite descriptions and demonstrative descriptions, I argue that the denotational difference between these expressions lies in whether the linking argument is present or not. Demonstratives are argued to realize a binary structure that requires both the description and the linker, with cross-linguistic evidence suggesting that this linker is inherently deictic. Definite descriptions, on the other hand, are analyzed as realizing the unary structure that only contains the description and lacks the linker. The binary structure is argued to be universally marked by demonstratives, while the realization of the unary structure varies across languages: some overtly mark it with a definite marker like articles, while some lack overt marking of the unary structure and make use of bare nouns instead.

This analysis has implications for the analysis of demonstratives in formal semantics. Recently, there has been a number of works arguing that demonstratives encode an anti-uniqueness requirement, namely that the use of a demonstrative description of form *that F* requires that there be another entity that meets the denotation of *F* in some relevant domain (Nowak 2019, Wolter 2006, Dayal & Jiang 2021, Owusu 2022, a.o.). Analyzing definite expressions and their functions from the notion of reference redirects the view of demonstratives and identifies its main function, not in anti-uniqueness, but in linking two modes of language: description and deixis. The comparison between definites and demonstratives in terms of deixis highlights a general restriction on cross-modal semantic composition between descriptive and deictic expressions. Based on this, I propose the Unique Modality Hypothesis, a general ban against freely composing descriptive content and deictic content without the use of a specialized operator, and argue that across languages, demonstratives serve as this operator that links the two modes of language. I show that if we take this as the main function of demonstratives, we can derive the anti-uniqueness inference that arises with demonstratives from general pragmatic principles, instead of stipulating a lexical requirement, which is shown to undergenerate.

The outline of the paper is as follows. In the rest of this introduction, I will motivate the study of definite expressions that take demonstratives to be the starting point, which is opposite of what is often done in the formal semantics literature. In Section 2, I propose an analysis of demonstratives that focuses on their ability to compose with gestural content. Demonstratives are analyzed as carrying an argument slot that selects for deictic information. In Section 3, I discuss other uses of demonstratives that are often described as non-deictic, suggesting that while not picking out a referent in the actual world, the content that is hosted in the linker slot still has important similarities to the deictic use. In Section 4, I analyze definite descriptions as demonstratives without the linker argument: definites, unlike demonstratives, rely solely on the description to resolve to a unique entity. One consequence of this analysis is that the semantic meaning conveyed by definites and demonstratives overlap in anaphoric uses. I discuss the predictions from this, looking at the case of Mandarin demonstratives. Then I go on to discuss the main implications that this analysis has on semantic analyses of demonstratives. In Section 5.1, I discuss how this analysis naturally derives anti-uniqueness by simply assuming general pragmatic assumptions of language use. In Section 5.2, I present the Unique Modality Hypothesis and discuss the role of demonstratives as modality

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linkers. In Section 5.3, I go back to the cross-linguistic properties of demonstratives and show how the current analysis is compatible with those properties. I conclude in Section 6.

### *1.1. Demonstratives and full specification*

In investigating how definite expressions interact with deixis, we see that there are at least two main approaches with different assumptions on what is semantically primitive or default. Studies of deixis and gesture have for a very long time highlighted that deixis is ontogenetically prior to grammatical elements (Butterworth 1998, Diessel 1999, Levinson 2004) and that deictic expressions serve as a diachronic source for many non-deictic expressions such as pronouns and definite articles across languages (Diessel 2013). Related to this view are analyses of definite articles as deriving from deixis such as *there* (Thorne 1972), and the assumption that anaphora is secondary to deixis (Lyons 1975). In the formal semantic literature on definite expressions, the opposite assumption is often in place. For example, many analyses of demonstratives derive their meaning by adding some further constraints to the 'default' semantics of *the* (Dayal & Jiang 2021, Nowak 2019, Wolter 2006, King 2001, Elbourne 2008). Moreover, deixis is generally subsumed under anaphora, and referents of deictic expressions are assumed to be resolved in the same way referents of anaphoric expressions are (Heim & Kratzer 1998, Levinson 2004).

I argue that even in formal semantics literature, we should take demonstratives to be the 'default' and definites to be the 'marked' demonstratives. Semantic defaultness or primitiveness does not have to be defined in terms of semantic complexity. It may be that an expression is more complex in carrying more content, but is simpler in other ways, such as reducing ambiguity. Demonstratives are simpler in that they fully specify the intended referent by 'pointing' to the entity, while definites rely on contextual cues and remain underspecified. Reference generally involves two main ingredients. The first is the linguistic form used to describe the entity. The second is a way to link the said description to the intended entity. Often times the second element is only contextually provided and not overtly expressed. This means that expressions such as pronouns and definite descriptions are inherently underspecified, with their denotation dependent on linguistic and contextual cues (Roberts 2003, H. Clark 1975, Tanz 1980). On the other hand, deictic demonstratives where the speaker points to the intended entity does not have such ambiguity. Demonstratives seem to carry an unambiguous link to the actual world, which Levinson (2004) calls 'clearly inbuilt contextual variables'. I argue that the semantics of demonstratives should encode this characteristic. A specific implementation of this idea will be explored in the next section.

### *1.2. Note on terminology*

Throughout this paper, I will make use of the term *demonstratives* to cover both pronominal and adnominal uses. Following Ahn 2019, I assume that the only difference between pronominal and adnominal expressions is the amount of content in the description. Specifically, pronominal elements only carry $\phi$ information in their description, while descriptions carry full NPs. The denotations for the personal pronoun *she* and a definite description from Ahn 2019 are shown in (1) as illustration. While $\phi$ features on pronouns such as the gender inference are often assumed to be presupposed (Sudo 2012, Heim & Kratzer 1998), analyzing them as restrictions to some argumentizing operator has been independently motivated in other works as well (see Esipova 2019b, von Heusinger 2002, Postal 1966, Gutzmann & McCready 2014).

(1) a. $[\![\text{she}]\!] = \iota x.[+\text{fem}](x)$
b. $[\![\text{the linguist}]\!] = \iota x.\text{linguist}(x)$

While I focus on demonstrative and definite descriptions in this paper, the analysis is assumed to extend to pronominal uses as well. Thus, I will use the terms *demonstratives* and *definites* broadly without specifying whether they are descriptions or pronouns.

## 2. Demonstratives as modality linkers

In this section I develop an analysis of demonstratives as binary definite expressions that link two different kinds of information to resolve reference. I start in Section 2.1 by reviewing some existing analyses of demonstratives, including those that account for the distribution of demonstratives from the notion of anti-uniqueness and show that these proposals undergenerate. Then, in Section 2.2, I present an alternative analysis that builds on Ahn 2022.

### *2.1. Demonstratives as carrying anti-uniqueness requirements*

In the classic account of demonstrative expressions, Kaplan (1989) argues that they contribute direct reference rigidly. By 'direct', he refers to the idea that a demonstrative description such as *that linguist* simply returns the said entity as the output rather than going through operators like $\iota$ that search for some relevant entity that meets the NP restrictions in the given context. By 'rigid', he refers to the idea that the returned entity is always identified at the utterance context, regardless of the layers of displacement encoded in a sentence, similar to how indexical expressions such as *actually*, *here*, and *now* in (2) only refer to a specific group of people who are actually in the utterance context regardless of the temporal and locative displacement.

(2) It is possible that in Pakistan, in five years, only those who are actually here now are envied. [Kaplan 1989:(4)]

For example, in (3), regardless of the evaluation context in which the conditional is interpreted, the person I will talk to is the linguist pointed to at the time of speech.

(3) If I meet a singer in Korea next year, I will talk to [that linguist]$_{\rightarrow}$.

Since Kaplan 1989, many non-deictic uses of demonstratives have been identified and shown to not encode rigidity (King 2001, Roberts 2002). Demonstrative descriptions can be anaphoric and refer to entities introduced in the discourse as in (4-a) (Roberts 2002); be quantified over as in (4-b) (King 2001); and host relative clauses which identify the intended referent (Wolter 2006, Simonenko 2014, Nowak 2019).

(4) a. I met a linguist. That linguist looked happy.
b. Every university professor cherishes that first publication of theirs. [King 2001]
c. That hero who kills the dragon will inherit the kingdom. [Wolter 2006]

In this respect, demonstratives are rather similar to definite descriptions. Note that the demonstrative descriptions in (4-a), (4-b), and (4-c) can be replaced with definite descriptions without changing the truth-conditional meaning. This partial overlap between demonstratives and definites is observed across languages. Demonstratives in many determiner-less languages serve to mark definiteness or anaphoricity (Jenks 2015, Ahn 2017, Schwarz 2009, 2013). Even in languages that have definite articles like English and German, the distinction between definites and demonstratives turns out to be subtle, especially in anaphoric uses (Schwarz 2009, Roberts 2002, Wolter 2006, King 2001, Elbourne 2008). Due to this, many have tried to identify exactly in which way the two differ, by focusing on contexts where definite descriptions are licensed but demonstratives are not. For example, Nowak (2019) discusses the contrast in (5), where *the* is licensed but the use of *that* is degraded. Similarly, Roberts (2002) and Wolter (2006) argue that demonstratives are not licensed when there is a unique entity that meets the NP denotation.

(5) {The/#That} author of *Waverley* also wrote *Ivanhoe*. [Nowak 2019]

Thus, demonstratives are often analyzed as definite descriptions that have distributional restrictions. Nowak (2019) proposes that demonstratives must carry additional arguments that properly restrict the set denoted by the NP, while Dayal & Jiang (2021) argue that demonstratives presuppose anti-uniqueness, namely that there must be at least one other entity that meets the NP denotation at a situation larger than the situation in which uniqueness is evaluated.

However, this anti-uniqueness presupposition has been shown to be overly strong. Blumberg (2020) shows that a speaker can overtly reject the anti-uniqueness presupposition by saying (6-a) and still felicitously use a demonstrative description in sentences like (6-b).

(6) a. I don't know if there are any other cars available, but...
b. ...that$_{\rightarrow}$ car looks expensive.

Another simple counterexample to anti-uniqueness presupposition is presented in (7). It is unlikely that that there is another oddly shaped disc flying in the air at the time (7) is uttered, regardless of whether we are looking at a larger situation or not, but the demonstrative description is readily licensed.

(7) Look at that oddly shaped disc flying in the air right now.

Thus, analyses assuming anti-uniqueness presuppositions undergenerate, and we need an alternative account. However, the anti-uniqueness inference seems robust: demonstrative descriptions like *that universe* is odd unless we accommodate and assume there are multiple universes at issue. If adding presuppositions to demonstratives is too strong, how do we derive this anti-uniqueness inference? I take the intuitions from Blumberg 2020 and Ahn 2022 that this should be derived as a pragmatic inference. I discuss in Section 5.1 the details of how the anti-uniqueness inference is derived, and why this analysis, and not the previous accounts discussed here, correctly predicts this inference to only arise in anaphoric uses of demonstratives.

Note that the anti-uniqueness-based analyses of demonstratives look at contexts where definites are licensed but demonstratives are not. However, as will be shown later in the paper, this difference turns out to be pragmatically derived rather than semantically encoded. In order to identify the difference between definites and demonstratives that is semantically relevant, I argue that we need to focus on contexts where demonstratives are licensed but definites are not. Building on works that look at the interaction between demonstratives and gestures, I will focus on deictic contexts and show that only demonstratives allow noun-internal composition of deictic elements like pointing.

### *2.2. Demonstratives as modality linkers*

It is known that gestures and speech work together to convey thought (Kendon 1980, McNeill 1992), but gesture studies have shown that gestures often do not contribute at-issue or restrictive information to the rest of the linguist content (**schlenker2018**, Ebert & Ebert 2014, Ebert et al. 2020, Esipova 2019b, Ahn & Davidson 2018, Zlogar & Davidson 2018, Tieu et al. 2017, a.o.). One of the ways in which demonstratives differ from definite descriptions is that they allow noun-internal composition with gestures. Ebert et al. (2020) show that demonstratives differ from definites in making pointing information at-issue. For example, while (8-a) has an inference that the bottle Cornelia brought is identical to the one being pointed to, this inference is not-at-issue. On the other hand, in (8-b) where a demonstrative description is used instead, the identity inference is at-issue and can be directly negated.

(8) a. Cornelia brought [the bottle]$_{\rightarrow \mathrm{B}}$.
(i) **presupposition:** there is a unique (contextually salient) bottle
(ii) **at-issue:** Cornelia brought that bottle
(iii) **non-at-issue:** the gesture referent is that bottle and is itself a bottle
b. Cornelia brought [this bottle]$_{\rightarrow \mathrm{B}}$.
(i) **presupposition:** there is a unique (contextually salient) bottle
(ii) **at-issue:** Cornelia brought that bottle
(iii) **at-issue:** the gesture referent is that bottle (and is itself a bottle)

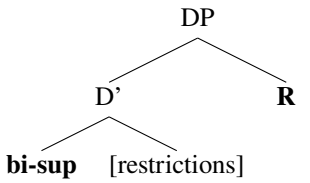
Based on this, they argue that demonstratives should be analyzed as an operator that takes the not-at-issue inference of the definite and shifts the dimension of that inference to at-issue.

Ahn (2022) extends the intuition in Ebert et al. 2020 and argues that demonstratives not only shift the dimension of the inference that results from producing the pointing gesture with a definite description, but also turn the pointing information into a property that can be composed noun-internally. The observation made in Ahn 2022 is that while it is true that definite descriptions with pointing often result in an identity inference as in (8-a), the kinds of inferences possible for a pointing is much wider, when the pointing is

directed to a different entity. For example, if the speaker utters the same sentence in (8-a) while pointing to a person instead of a bottle, the resulting inference would not be that of identity but that the person pointed to is relevant to the conversation. In this use, the pointing is adding some supplementary, propositional information that the person being pointed to is relevant to the conversation at hand. This flexibility in inference is not available when pointing occurs with a demonstrative: if the speaker changes the definite into a demonstrative in (8-b) but points to a person instead of the bottle, the only available inference would be that of identity, where the speaker ends up suggesting that the person is a bottle. Based on this contrast, Ahn (2022) argues that demonstratives takes the deictic information contributed by pointing as a locational modification, allowing and requiring that information to compose inside the restriction of a supremum operator that returns some maximal entity that is at that location.

Her analysis of demonstratives is shown in (9) and (10). She adopts the Hidden Argument Theories of demonstratives represented by King 2001 and Elbourne 2008, which argue that demonstratives have two restrictions rather than one. The idea is that while a definite description of the form *the F* returns the unique $x$ that is F, a demonstrative description *that F* returns the unique $x$ that is F and G. Instead of analyzing demonstratives as having two restrictions that are subject to the same $\iota$ operator, however, Ahn (2022) argues that the demonstrative realizes a binary-supremum operator that takes two separate arguments, where the second argument is restricted to a deictic pointing, an anaphoric index, and a relative clause.

(9)




(10) $[\![\text{bi-sup}]\!] = \lambda P.\ \lambda R.\ \iota x{:}\forall y\ [P(y) \wedge R(y) \leftrightarrow y \sqsubseteq x]$ [Ahn 2022]

I adopt the intuition in Ahn 2022 that the main role of demonstratives is to link the two argument slots and return the maximal entity that meets both properties, but add that the second argument should be restricted to deixis, namely some pointer to the actual world. This allows us to account for why only demonstratives, and not definites, can take deictic information restrictively in the NP restriction. I make two small modifications to (10): a) the second argument $R$ is specified to be some deictic element, represented with the subscript $\gamma$; b) $R$ is always interpreted in the actual world regardless of what world variable is provided from the context. That the $R$ property is evaluated against the actual world and not varied across the world of evaluation captures the rigidity effect discussed in Kaplan 1989.

(11) $[\![\text{DEM}]\!] = [\![\text{bi-sup}]\!] = \lambda P.\ \lambda R_\gamma.\ \lambda w.\ \iota x{:}\forall y\ [P(y)(w) \wedge R_\gamma(y)(w_0) \leftrightarrow y \sqsubseteq x]$

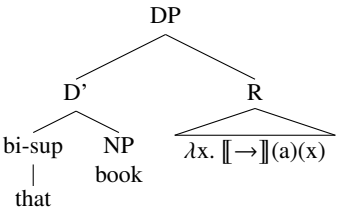
Thus, in this analysis, the presence of the second slot is motivated by the fact that the two kinds of information that a demonstrative takes are of different nature. The first argument is the NP content, which is descriptive in nature. The second argument is what I call the linker, and is inherently deictic. What this deictic linker does is refer to a particular event or entity in the actual world, much in line with what Kaplan (1989) calls the rigid reference of demonstratives. The observations in the literature that demonstratives necessarily make pointing information at-issue (Ebert et al. 2020) and restrictive (Ahn & Davidson 2018) are also compatible with this idea. Ahn & Davidson (2018) show in an experimental study that demonstratives require deictic content to be restrictive while pronouns allow it to be supplementary. In their study, the presence of pointing with a demonstrative description requires English-speaking participants to interpret the expression as deictically referring to an entity in the actual context and not anaphorically referring to an entity introduced in the discourse. This differed from the use of pointing with pronouns, where participants still interpreted them anaphorically even when a pointing was present. These findings are compatible with the analysis presented here, where demonstratives lexically select for a deictic element in their second argument slot, thus always taking it to be restrictive when present.

In summary, in order to highlight the function of demonstratives as linking two modalities and bringing gesture content into the noun-internal restriction, I argue that the second argument position should be restricted to deictic elements.

### *2.2.1. Deriving a deictic demonstrative*

Given the analysis laid out above, a deictic use of a demonstrative description can be derived straightforwardly. I provide below the analysis of a demonstrative description *that book* with a deictic pointing to a location $a$, which is represented with $\rightarrow$ and a subscript $a$.

(12) $[\![\text{that book}_{\rightarrow a}]\!]$ = *'the maximal entity x that is a book and is located at a'*




(13) $[\![\rightarrow]\!] = \lambda y.\ \lambda x.\ \lambda w.\ R_1(x,y)(w)$

a. $y$: location (demonstratum)

b. $R_1$: free variable over relations between $x$ and $y$
(identical to, looks like, located in, sounds like, ...)

The pointing gesture is analyzed as taking a locational variable $y$ from the actual world, an entity $x$, and returning true if and only if some contextually relevant relation $R$ holds between $y$ and $x$ in the actual world. In general contexts, this $R$ variable would default to 'located in', so that $R(x, y)$ returns true if and only if $x$ is physically located at $y$ in the actual world, but deferred uses are also possible. For example, the speaker might point to a poster of a book, in which case $y$ would be the poster and $R$ would be a more general relation between the poster and the book represented in the poster.

## 3. Linker possibilities: Deixis extended

As we saw already, demonstratives also allow non-deictic uses (Roberts 2002, King 2001, Elbourne 2008, Wolter 2006, Nowak 2019, Simonenko 2014). In addition to hosting a pointing gesture, demonstratives can also occur with prepositions as in (14-a) and relative clauses as in (14-b).

(14) a. That book in the corner is mine
b. That hero who kills the dragon will inherit the kingdom.

One could analyze the preposition in (14-a) and the relative clause in (14-b) as composing with the noun first, in which case they do not need to be hosted in the second argument slot of demonstratives. However, I argue that these expressions must occur separately in the second argument slot rather than combining with the noun. This can be shown by using pronominal demonstratives, which are often assumed to lack an NP restriction that can host such expressions.[1] In (15-a) and (15-b), the pronominal demonstrative *that* is used, but can still host prepositions and relative clauses.

(15) a. That in the corner is from Sweden, while that behind the door is from Germany.
b. That which rolls gathers no moss. [Elbourne 2013]

In addition, Yu (2023) shows that demonstratives in languages like Mandarin can also host a name in the $R$ position.

(16) Jin na-ge ren
Jin DEM-RC person
(lit.) 'Jin that person'

Demonstratives can also be used anaphorically without any overt material other than the NP, as in (17).

[1] D-Type theories of pronouns argue that pronouns also have NP restrictions, but Ahn (2019) argues that pronominal demonstratives and pronouns should be analyzed as only carrying $\phi$-features in their restrictions, not NPs.

(17) a. I met a linguist. That linguist looked happy.
b. Every dog has an owner who thinks that that dog is the best. [Roberts 2002]

That demonstratives can take CP arguments or some covert anaphoric argument in addition to overt deixis has been observed for English *that* in many previous works (King 2001, Elbourne 2008, Wolter 2003, Simonenko 2014, Ahn 2019, Nowak 2019, a.o.). Relatedly, Kim (2018) discusses constructions in English such as *That's a nice dress you have there* where a demonstrative occurs in a copular construction and requires a relative clause. The association between demonstratives and clausal arguments like relative clauses is also attested in many languages that make use of correlative structures like (18), which require demonstratives that refer to some entity defined by a clausal modification (Bhatt 2003).

(18) [jo sale-par hai] [Maya us CD-ko khari:d-egi:]
Rel sale-on be.Prs Maya.F Dem CD-Acc buy-Fut.F
'Maya will buy the CD that is on sale.'
(Lit. 'What is on sale, Maya will buy that CD.') [Hindi]

What unifies the expressions that can appear in the second slot, such as deixis, prepositions, names, and relative clauses? Nowak (2019) gives a syntactic argument, suggesting that the only arguments that demonstratives can take in addition to the NP are those that can appear outside the demonstrative-NP constituent. He subsumes deixis under anaphora, and adopts the analysis in Bach & Cooper 1978 where a clausal restriction of a definite element is syntactically located outside the constituent containing the D element and the NP. Under this account, a demonstrative can only host a relative clause or an index argument, which in turn can be anaphoric or deictic.

Ahn (2019), on the other hand, argues that the expressions that occupy $R$ form a natural semantic class based on their function, following Umbach & Gust 2014. Umbach & Gust (2014) argue that the role of a deictic gesture is similar to that of overt and covert reference arguments. For example, in describing how Anna cut the fish in (19), the reference argument can be deictic (19-a), anaphoric (19-b), or clausal (19-c).

(19) a. (speaker pointing to someone preparing a fish)
So hat Anna den Fisch (auch) zerlegt.
'Anna cut the fish like this, (too).' [deictic]
b. Berta zerlegte den Fisch in fünf Teile. Anna hat das auch so gemacht.
'Berta cut the fish in five parts. Anna did it like that, too.' [anaphoric]
c. Anna hat den Fisch so zerlegt, wie diese Person es tut.
'Anna cut the fish like this person did.' [clausal]
[Umbach & Gust 2014;(1c),(2c),(4c)]

Ahn (2022) relates this observation to what has been observed for comparatives and equatives in English. Degree heads as well as expressions such as *same*, for example, have been analyzed as taking an implicit, anaphoric argument or an overt, linguistic argument (see Carlson 1977; Alrenga et al. 2012; Bhatt & Takahashi 2011; Umbach & Gust 2014; Hanink 2018, a.o.). For example, in the equative expression in (20) and in the comparison in (21), the reference argument can be covert and provided by context, or overt and provided by a clausal element.

(20) a. I have the same book.
b. I have the same book as you have.

(21) a. My book is longer.
b. My book is longer than yours is.

Adding deixis to the set of reference arguments, Ahn (2022) argues that a deictic gesture can also serve as a reference argument for *same* as in (22), thus serving the same role as the anaphoric and the clausal argument in (20).

(22) I have the same$_{\rightarrow}$ book.

According to this analysis, what unifies a deictic information, an anaphoric information, and a clausal

information into a set of expressions that can be hosted in *R* is their ability to serve as reference arguments to linguistic expressions such as comparatives. Demonstratives require one of these to be present in its second argument, and so when a deictic gesture is not available for demonstratives, an anaphoric information or a clausal expression can fill the *R* slot and restrict the referent.

Recall that in Section 2, I have argued that demonstratives are lexically specified to take a deictic element in its *R* position. It is not immediately clear how an analysis of demonstratives that is inherently deictic can be extended to account for the hosting of relative clauses and anaphoric indices, which are not deictic in nature, without stipulating a set of rather arbitrary expressions that can be hosted in *R*. Moreover, the accounts presented in Nowak 2019 and Ahn 2022 do not include prepositions or names which have also been shown to appear in the *R* position. I argue that there is a way to extend the deixis-based analysis to account for this set if we assume that deictic reference can sometimes be rendered linguistically. For example, it seems possible to argue that a name is a linguistic version of a deictic pointing, given that they share the property of rigidly denoting an entity (Kaplan 1989, Ebert et al. 2020). A preposition phrase, too, can be seen as a linguistic version of pointing, given that the two can be interchangeable as in (23).

(23) a. (Pointing to a book behind the door) That book$_{\rightarrow}$ is expensive.
b. That book behind the door is expensive.

A similar argument can be made for other expressions that occur in *R*. The idea is that if a speaker were to use a description rather than deictic pointing to a particular event or entity, the kinds of descriptions that would be used are a clause, preposition phrases, and names. Thus, though descriptive in mode, it still functions as a deixis. Because a deictic pointing is analyzed as an $< e, t >$ property evaluated at $w_0$, we assume that the other expressions are also parallel in type and world selection. The resulting meanings for the uses in (14) are shown below.

(24) a. $[\![\text{that book in the corner}]\!]^w = \iota x{:}\forall y\ [\text{book}(y)(w) \wedge [\![\text{in the corner}]\!](y)(w_0) \leftrightarrow y \sqsubseteq x]$
b. $[\![\text{that hero who kills the dragon}]\!]^w = \iota x{:}\forall y\ [\text{hero}(y)(w) \wedge \text{kill-dragon}(y)(w_0) \leftrightarrow y \sqsubseteq x]$

Note that (30) has a free-relative-like reading, where whoever kills the dragon inherits the kingdom. This is not directly encoded in (24-b). However, free relatives in some works are analyzed as an iota operator taking the relative clause as an argument (Polian & Aissen 2020, Caponigro 2000, 2003). So (24-b) can readily be extended to allow free relative readings if we adopt this view.

For names appearing in *R* in languages like Mandarin, we can assume that the name is interpreted as a property of being called that name in the given world, or that there is some kind of a labeling function similar to an index function.

(25) $[\![\text{Jin that person}]\!]^w =$
a. $= \iota x{:}\forall y\ [\text{person}(y)(w) \wedge \text{named-Jin}(y)(w_0) \leftrightarrow y \sqsubseteq x]$
b. $= \iota x{:}\forall y\ [\text{person}(y)(w) \wedge y =_{w0} \text{Jin} \leftrightarrow y \sqsubseteq x]$

Finally, anaphoric uses of demonstratives would be licensed if the entity is salient enough that no overt expression is necessary, just as in the case of comparatives and equatives. Ahn (2022) analyzes anaphoric uses of demonstratives to carry an indexing property which takes an entity and returns true if and only if that entity is identical to the entity assigned at the given index. Others have argued that anaphoric uses are still based in deixis for demonstratives. For example, Roberts (2002) argues that anaphoric demonstratives still presuppose a demonstration, but the demonstration is to a linguistic entity rather than an entity in the actual context. Hinterwimmer (2019) argues that there are deictically-derived constraints visible on anaphoric uses of demonstratives that are not detected for definite descriptions. For example, when two antecedents are introduced in the discourse, the demonstrative descriptions cannot refer in a way in which their 'pointing' trajectories cross each other.

I adopt this deixis-based view of anaphoric demonstratives in Roberts 2002 and Hinterwimmer 2019 and argue that what is occupying *R* in anaphoric uses of demonstratives is some property that takes an entity and identifies it with the most recent entity discussed in the discourse. It seems that in this way, anaphoric demonstratives are quite similar to proximal demonstratives, which can refer deictically without an overt pointing. Ahn (2022) argues that entities in the proximity of the speaker are often easily identified, and thus there might be less need for pointing. The anaphoric uses of demonstratives

can also be analyzed as a similar extension of deictic uses. For example, an overt pointing gesture is not necessary in contexts where all of the interlocutors are already attending to the intended referent. Similarly, anaphoric demonstratives might be licensed without an overt *R* component because they are salient. This is compatible with the observation in Roberts 2002 that demonstratives show a 'recency effect', where they refer to the last-mentioned entity when more than one antecedent is possible.

To summarize this section, I have argued that demonstrative descriptions should be analyzed as binary definite expressions, that have both a descriptive form and a deictic linker. The deictic linker picks out a particular entity through deixis, or through descriptions that replace the deixis. Even when this linker is covert, I assume that what is underlyingly present in the linker slot is deictic in nature, following Roberts 2002 and Hinterwimmer 2019, which explains the way anaphoric demonstratives refer to the most salient and recently-introduced entity and are sensitive to pointing trajectories.

## 4. Definite vs. Demonstrative

Once demonstratives are established to be binary definite expressions, the analysis of definites can be extended from the demonstrative structure. I propose that definites are unary versions of demonstratives, expressions that only carry the descriptive argument and lack the deictic argument. Because it only has one argument rather than two, a definite description relies on the NP restriction alone to identify the referent. In languages like English, this unary definite expression is realized as a definite article *the*, while many other languages do not overtly mark this and simply make use of bare nouns. The denotation, which does not differ from the generally-assumed Fregean analysis, is shown below.

(26) $[\![\text{the}]\!] = \lambda w.\ \lambda P.\ \iota x\colon \forall y\ [P(x)(w) \leftrightarrow y \sqsubseteq x]$

Bare nouns in bare argument languages have been argued to either make use of covert $\iota$ or other type shifting to result in a definite interpretation (Jenks 2015, Dayal 2011, Jiang 2017, a.o.). What underlying mechanism is used to derive the definite interpretation is not critical to the main arguments of this analysis: as long as demonstratives and definites in these languages differ with respect to the presence of the linker argument, the main implications of this theory would remain consistent.

This analysis predicts the distribution of definites and demonstratives across languages to show some overlap. Definite markers in many languages have been shown to distinguish two different mechanisms of identifying a referent (Schwarz 2009). The first is through situational uniqueness, where some unique entity that meets the NP restriction is identified. The second is through familiarity, where some entity is identified through anaphoric relation to a previous mention in the discourse. Schwarz (2009) argues that the two mechanisms are morphosyntactically distinguished in many languages, calling the uniqueness-based definites 'weak definites' and the familiarity-based definites 'strong definites'. The strong definite, according to Schwarz 2009, carries an anaphoric index in its restriction in addition to the NP restriction.

In the proposal presented here, the only difference between a definite and a demonstrative is the absence and the presence of the linker argument, respectively. Also, I have argued that demonstratives can host anaphoric indices inside this linker slot, though its underlying mechanism may be deictic. Together with the argument in Schwarz 2009 that strong definites carry anaphoric indices in their restrictions, this analysis predicts an overlap between strong definites and anaphoric demonstratives, which is observed across languages (Schwarz 2009, Jenks 2015, Schwarz 2013). This has two main implications. First, because there are two expressions that overlap partially in their meaning, we expect some pragmatic effects of using one form over the other. I discuss this further in Section 5.1, where I argue that this overlap is the source for the anti-uniqueness inference of demonstratives. Second, given that the cues of distinguishing unary and binary definites would be conflated in anaphoric uses, we predict reanalyses that might lead to language variation or change. This aligns with the general direction in the diachronic development, where definite articles develop from demonstratives across languages. Many deictic demonstratives over time become anaphoric (Himmelmann 1996, Ahn & van der Wal 2019, Ahn 2017), and Simonenko (2022) argues that the strong definite is semantically in the intermediate stage between a demonstrative and a definite proper.

One possible evidence for such a variation is detected in Mandarin. It has been argued that the weak vs. strong distinction in definiteness also exists for languages that lack overt definite markers (Jenks 2015,

Ahn 2017, Cho 2016, a.o.). According to Jenks 2018, the strong definites are realized as demonstratives while the weak definites are realized by bare nouns. Bare nouns, however, have been shown to also have anaphoric uses (Dayal & Jiang 2021, Jiang 2012, a.o.). As mentioned earlier, while the overt marking of binary definites seems universal, the overt marking of unary definites varies across languages. Some languages are unary-marking languages, like English, while some only mark binary definites overtly. A language learner must rely on cues in their input to decide whether their language is unary-marking or not. The overlap between demonstratives and definites in anaphoric uses in a language that lacks overt marking of unary definites might suggest to the learner that their language is unary-marking, and that the demonstrative used in the anaphoric context is a unary definite marker. This kind of reanalysis of demonstratives could be a cause for the change from demonstratives to definites (Simonenko 2022). There is preliminary evidence that this kind of reanalysis of demonstratives might be taking place in Mandarin. Recent studies show that Mandarin demonstrative *na* shows more definite-like properties than demonstrative-likes properties. For example, Zhu & Ahn (2022) show from an experimental study that Mandarin demonstratives readily allow bridging, which is generally not available for demonstratives. For example, in (27), the demonstrative description *na-wei zuozhe* ('that author') refers to the author of the book introduced in previous discourse. Experimental study shows that participants's rating of this sentence is significantly higher than control sentences that are pragmatically or semantically odd.

(27) zuo-tian wo mai le **shu**. wo hen xiang jianjian na-wei zuozhe.
yesterday I buy ASP book I very want meet NA-CL author
'Yesterday I bought the book. I really want to meet that author.'

It is possible to argue that in (27), the demonstrative is licensed because the underlying mechanism that allows bridging is anaphoric. Schwarz (2009) distinguishes two types of bridging based on whether the mechanism is uniqueness-based or anaphora-based. The part-whole bridging is licensed through a unique existence in the situation established by the antecedent, while the producer-product bridging is licensed through an anaphoric index that picks up the antecedent. Schwarz (2009) observes that part-whole and producer-product bridging are realized by weak and strong definites, respectively, in languages that distinguish the two. Since the mechanism used in (27) is based on anaphora, it is possible that a binary definite is used with an index in the *R* position. However, Zhu & Ahn (2022) show that even for part-whole bridging that is argued to be licensed by uniqueness, demonstrative descriptions are rated highly by participants, suggesting that *na* has uniqueness-based, unary uses.

(28) qu-nian wo mai le **che**. wo zong wangji jiancha na-ge shache.
last-year I buy ASP car. I always forget check na-CL brake.
'I bought the car last year. I always forget to check that brake.'

This kind of reanalysis and diachronic development from demonstratives to definites is readily predicted from the denotations proposed in this paper, where there is an overlap between definites and demonstratives in anaphoric uses, and the idea that languages parametrically have an option of marking unary definites. On the other hand, under previous analyses of demonstratives that rely on rigidity or anti-uniqueness, it is unclear why such change would occur given that the distribution of these two expressions are predicted to be either independent of each other or mutually exclusive.

## 5. Implications

### *5.1. Deriving Anti-uniqueness*

We saw in Section 2 that one of the prominent views of demonstratives argue that they require anti-uniqueness. I discussed how implementing anti-uniqueness through presupposition undergenerates. In this section, I first present one additional argument against the anti-uniqueness view by showing that this view also overgenerates when other uses of demonstratives are considered. Then, I show that the proposal in this paper in which demonstratives are analyzed as carrying a second argument that is deictic can better account for the empirical picture.

Recall the examples showing the so-called 'anti-uniqueness' effect in (29-a) and the counterexamples

to the anti-uniqueness view in (29-b) and (29-c), respectively.

(29) a. {The/#That} author of *Waverley* also wrote *Ivanhoe*.
b. I don't know if there are any other cars available, but that$_{\rightarrow}$ car looks expensive.
c. Look at that oddly shaped disc flying in the air right now.

What we see is that anti-uniqueness effects only arise when the *R* slot does not carry an overt element. In (29-b), there is overt deixis, while in (29-c), the imperative *look* creates a deictic context, and there is a relative clause following the demonstrative description. On the other hand, there is no noun-external element overtly occupying the *R* slot in (29-a). We have already established that for a demonstrative, the *R* slot is always filled, while a definite description lacks it. Thus, this analysis predicts the demonstrative description in (29-a) to at least carry some index information or deictic pointing to some discourse entity underlyingly.

What this means is that in (29-a) the definite and the demonstrative descriptions result in the same truth-conditional value, namely the unique author of *Waverley* in two different ways. The definite simply takes the NP restriction *author of Waverley* and returns the unique entity that meets that restriction, while the demonstrative takes both the NP restriction and some additional *R* property such as index and returns the unique entity that meets both of the properties. Thus, the demonstrative description is semantically more complex. That a more complex item is dispreferred when there is a simpler form available is an idea reflected in many pragmatic principles. For example, Grice's *Brief* requires that a cooperative speaker be as brief as possible. Meyer 2014 argues that if two LFs result in the same meaning, the simpler form must be used. Related are Schlenker's (2005) *Minimize Restrictors!*, which argues that a definite description with the least amount of modifiers is pragmatically preferred over that with redundant modifiers, and *Minimize DP!* in Patel-Grosz & Grosz 2017, which bans additional syntactic projections if not needed.

Thus, this analysis predicts that if the definite description and the demonstrative resolve to the same individual in the given context through anaphora, the demonstrative would be degraded. This pragmatically-derived prediction only arises for (29-a), but not for (29-b) or (29-c), where the demonstrative and the definite do not overlap in meaning. Recall from Section 2 that in deictic contexts, demonstratives and definites differ in the way deixis composes with the rest of the linguistic content: deixis is at-issue and noun-internally interpreted for demonstratives, but only plays a non-at-issue, supplementary role for definites. Given this difference in the resulting meaning, we do not expect the definite description to compete with the deictic demonstrative as a simpler alternative.

Note that anti-uniqueness also does not arise when demonstratives take relative clauses as in (30). The demonstrative description in (30) does not require there to be any other individual who kills the dragon.

(30) That hero who kills the dragon will inherit the kingdom.

This also seems to stem from the fact that the definite and the demonstrative differ in their meanings for such sentences. As mentioned already, the demonstrative allows a free-relative-like meaning in (30), where whoever kills the dragon is bound to inherit the kingdom. This reading is not available when a definite article replaces the demonstrative: the only possible reading is that some salient entity who is a hero that kills the dragon will inherit the kingdom. To see this difference, we can observe the scopal properties of similar expressions as in (31).

(31) a. At the conference, I repeatedly talked to the people who work on demonstratives.
b. At the conference, I repeatedly talked to those who work on demonstratives.

In (31-a), the definite description takes wide scope over the adverbial, and the resulting meaning is that the speaker talked to some salient group of people multiple times. In (31-b), there is another possible reading, where the speaker simply talked to whoever worked on demonstratives. Thus, in a context where the speaker talked to different people who worked on demonstratives each time, (31-b) would be true but (31-a) would be false. Given this difference, we correctly do not expect the pragmatic competition to take place for demonstratives that carry relative clauses in the *R* slot.

Thus, what we see is that the anti-uniqueness inference is only detectable in anaphoric uses, namely only in contexts where demonstrative descriptions and definite descriptions overlap in meaning.

Deriving anti-uniqueness this way is superior to stipulating a presupposition into the lexical denotation

of demonstratives for several reasons. First, because this inference only arises when a definite description competes with the demonstrative, the analysis correctly captures that anti-uniqueness would only arise in anaphoric contexts, and not in deictic or generic contexts. Second, because this is a pragmatically-derived inference rather than a presupposition, the analysis correctly predicts that this inference is cancelleable and that it can be bled by other pragmatic intentions. Ahn (2019) argues that the demonstrative description might be preferred in anaphoric contexts for some bare argument languages even if the simpler bare noun is available for anaphoric uses. She reasons that this might be due to the bare noun being compatible with many different interpretations such as kind and indefinite. Thus, the use of the demonstrative might signal to the addressee that an anaphoric interpretation is intended. This additional function of demonstratives may bleed the anti-uniqueness inference if it is a pragmatic inference, but not if it is a lexically-encoded presupposition.

### *5.2. Unique Modality Hypothesis*

In comparing how definites and demonstratives interact with deictic expressions, I have argued that only demonstratives allow noun-internal composition with deixis. The inability to compose with deictic elements is not limited to definites: that gestural content does not readily compose with the rest of the linguistic content with the same level of at-issueness and restrictiveness has already been discussed above (Ebert & Ebert 2014, Ebert et al. 2020, Schlenker 2018, Esipova 2019b, Ahn & Davidson 2018, Zlogar & Davidson 2018, Tieu et al. 2017).

Following and extending these previous observations, I argue for a general restriction against semantically composing content from different modalities. By 'modalities', I do not refer to the spoken vs. signed distinction in natural languages, but instead to general mechanisms of language. The discussion of different mechanisms of languages dates back to Charles Pierce's work, who identifies three main semiotic mechanisms: symbols, icons, and indices. Symbols convey meaning through arbitrary description, while icons do so through iconic depiction, and indices through direct pointing. The idea behind the general restriction I propose here is that while language users can make use of these mechanisms freely, they cannot co-occur for sentence-internal composition. I name this ban the 'Unique Modality Hypothesis' and define it as follows:

(32) **The Unique Modality Hypothesis**
Sentence-internal semantic composition such as Functional Application and Predicate Modification across modalities is banned without a lexical operator
a. modalities: description, deixis

What does it mean for expressions to have restrictions on sentence-internal composition? To elaborate on this notion, I first present the notion of a proto-declarative discussed in Bates 1976. Pointing occurs early in human development, with pre-linguistic infants starting to produce and respond to pointing between nine and twelve months. Bates (1976) argues that in this early stage, infants make use of pointing as 'proto-declaratives' or 'proto-imperatives', replacing full declarative or imperative sentences. As their language develops, pointing is incorporated into the rest of the linguistic context, as we saw from examples above. Extending this notion, I argue that the function of a deictic pointing remains declarative and clausal in nature. So regardless of where in the uttered sentence the pointing occurs, its contribution is not composed sentence-internally. All it does is add a declarative or an imperative information to the descriptive sentence, as a supplement. This supplementary function of pointing is illustrated in the sentences in (33).

(33) a. (Pointing to a coffee machine) The coffee machine is broken.
b. (Pointing to her tea) The coffee machine is broken.
c. (Pointing to another cafe) The coffee machine is broken.

In all three of these sentences above, the symbolic description – the grammatical sentence – remains the same, while the pointing is directed at different entities and locations. Based on where the pointing is directed, the resulting inference is different. In (33-a), the speaker seems to indicate which coffee machine is broken, in line with the identity inference argued for in Ebert et al. 2020. In (33-b), the speaker can be understood as explaining why she is drinking tea rather than coffee. In (33-c), the speaker might be

interpreted as telling the addressee to go to another cafe because the coffee machine at her own cafe is broken. In (33-a) and (33-b), the inference of the pointing is declarative, while in (33-c), the inference is imperative. It is of course possible to come up with other interpretations of the pointing in each of these cases, but the overarching generalization is that the pointing adds a declarative or an imperative information to the main sentence.

The Unique Modality Hypothesis restricts the role of pointing to this clausal-level, supplementary information. According to this ban, a description like an NP cannot simply compose with a deictic pointing to return a property of entities that meet the NP denotation and the information contributed by pointing. Instead, an operator that takes the expressions from the two modalities as arguments and returns an entity that meets both properties is needed. Crucially, I argue that demonstratives across languages play this role as a unique modality linker.

This analysis can derive a number of patterns observed in the literature. Demonstratives allow pointing to compose restrictively into the restriction of the argumentizing operator, be it $\iota$ or something else, as discussed by Ahn & Davidson 2018. This explains the contrast between (34-a) and (34-b), where only the latter allows pointing to be interpreted restrictively.

(34) a. #[The computer]$_{\rightarrow A}$ is new, but [the computer]$_{\rightarrow B}$ is old.
b. [That computer]$_{\rightarrow A}$ is new, but [that computer]$_{\rightarrow B}$ is old.

It also accounts for why demonstratives would turn the non-at-issue contribution of pointing to at-issue as argued in Ebert et al. 2020.

One question that remains is why cross-modal composition is restricted in this way. While the Unique Modality Hypothesis and the analysis of demonstratives as modality linkers capture the fact that deictic information does not enter noun-internal composition of the rest of the sentence unless there is a demonstrative, one may ask what the underlying cause for this limitation is. One possible explanation might come from a recent discussion in Davidson 2023 on how depictive content differs from descriptive content. According to Davidson, descriptive content, which often consists of arbitrary symbols in spoken or signed languages, function to form partitions of the world. For example, the word 'rainbow' gives a set of entities based on whether they classify as rainbows, but does not specify how each member of that set should be. On the other hand, a depictive content, such as iconic gestures and ideophones, specifies the characteristics of a particular entity or an event. For example, if one utters the sentence in (35) while iconically gesturing an arc, the implication would be that the speaker saw a rainbow that had that particular shape.

(35) I saw a rainbow$_{\text{[half-arc]}}$

Davidson (2023) notes that the particular-selecting semantics of depictive expressions show restrictions when composing with partition-based content such as negation and questions. For example, ideophones in Japanese have been shown to be degraded under negation (Kita 1997), as shown by the contrast between (36) and the negation in (37).

(36) tama ga **gorogoro** to korogat-ta no o mi-ta.
ball NOM mimetic roll-PAST Nominalizer ACC see-PAST
'(One) saw a ball rolled gorogoro.'
(gorogoro = movement of a heavy round object with continuous rotation)

(37) *tama ga **gorogoro** to korogat-ta no de wa na-i
ball NOM mimetic roll-PAST Nominalizer COP focus NEG PRES
'It was not the case that a ball rolled gorogoro.'

Note that with a regular, descriptive adverb, negation is perfectly fine, as shown in (38).

(38) tama ga **sizukani** korogat-ta no de wa na-i
ball NOM quietly roll-PAST nominalizer COP focus NEG PRES
'It was not the case that a ball rolled quietly.'

Davidson (2023) arguees that this restriction is due to the fundamental difference in how descriptive

and depictive content convey meaning. Depictive content selects for a particular event or entity while descriptive content gives a partition of the possible worlds. Thus, negation with *gorogoro* in (37) is unavailable because negation makes partitions of the worlds, which is incompatible with the particular-depicting function of mimetics. This limitation holds between all depictive contents like gestures and all partition-based semantic operators like questions.[2] Adopting this view, we would predict questions such as (39) to be degraded, given that partition-based semantics is applied to a particular-selecting depiction of a rainbow, while a similar example with a descriptive modifier as in (40) is predicted to be felicitous.

(39) ?Did you see rainbows$_{\text{[half-arc]}}$?

(40) Did you see rainbows with small arcs?

The Unique Modality Hypothesis presented in this section can be recast as blocking semantic composition across expressions that give a partition of the possible worlds with expressions that depict a particular entity or an event. Because I analyze pointing as a locational modification, deixis can be subsumed under the larger category of depiction, thus making the same two-way distinction in semiotic strategies as in Davidson 2023. Subsuming deixis into depiction, the modalities of languages under this analysis would refer to symbolic description and deictic depiction.

This predicts that demonstratives would serve as an operator that can link depiction to description as well. This prediction is borne out. While information contributed by iconic gestures do not readily contribute at-issue content (Zlogar & Davidson 2018, Esipova 2019b,a, Schlenker 2018, Ebert & Ebert 2014, Ebert et al. 2020), this information becomes at-issue and restrictive when demonstratives are used, as in (41): while the gestures that depict the respective shapes of the tables are incompatible with definite descriptions in (41-a), they become much more natural with demonstratives in (41-b).

(41) QUD: I have two tables, one rectangular and one circular.
Which table did you see?

a. #I saw the[circle] table, but not the[rectangular] table.
b. I saw this[circle] table, but not this[rectangular] table.

Moreover, we predict demonstratives to make the degraded examples such as (39) felicitous, since they allow particular-selecting, depictive content to compose with the rest of the descriptive content. This is borne out, as shown in (42). By adding a modifier that contains a demonstrative as *like this*, or producing the gesture at the utterance time of the demonstrative, we can compose the depictive element with the partitioning-based semantics of questions and negation.

(42) a. Did you see rainbows like this$_{\text{[half-arc]}}$?
b. Did you see these$_{\text{[half-arc]}}$ rainbows?
c. I did not see rainbows like this$_{\text{[half-arc]}}$.
d. I did not see these$_{\text{[full-arc]}}$ rainbows, but I saw these$_{\text{[half-arc]}}$ rainbows.

### *5.3. Properties of demonstratives*

Across languages, demonstratives are observed to have certain shared properties. First, demonstratives are argued to be universal across languages, while definite markers are not (Diessel 2013). Demonstratives also precede other definite expressions in acquisition, where they are one of the few functional terms acquired in the one-word stage. (E. Clark 1978, Diessel 2013). They also serve as the source for other grammatical forms in many languages, such as pronouns, complementizers, and definite articles (Diessel 2013, Himmelmann 1996).

In general, what we observe is that demonstratives seem to be the default element that appears first in language and in development, and is found in all language systems. At a first glance, this does not

[2] Note that it is not the case that all depictive elements are particular-selecting and descriptive elements are partitioning. Davidson (2023) argues that the more conventional a depiction like a gesture becomes, the more partition-like its semantics becomes. So the contrast between (39) and (40) is not necessarily clearcut: if the half-arc gesture is contextually familiar to the interlocutors, the gestural component would also serve as a partioning element that returns a set of entities that have small arcs.

seem readily compatible with the analysis proposed here because demonstratives are more complex than definites by making use of a binary structure, and because all of the ingredients needed to build a definite is already present in the demonstrative. The question I address here is why the more complex form is found earlier and more frequently across languages.

To answer this question, I suggest that the key is not in the amount of information carried in the denotation but the ease with which reference can be made and resolved. In explaining why demonstratives are acquired so early in acquisition, Diessel (2006) notes that deictic pointing that demonstratives occur with allows children to make reference to entities without needing to know the labels. Note that this naturally follows from the binary view of demonstratives presented here: since deixis can easily be used to point to the referent, there is less dependence on the descriptive part.

The main consequence of the binary analysis of demonstratives, which is not shared by other accounts, is that the reference is always fully specified: in addition to the descriptive content, there is a particular-selecting element added to the second argument slot. With demonstratives, reference is not left unspecified. In this respect, demonstratives are simpler than definites, which must rely on contextual cues to resolve to the intended referent (see Tanz 1980 for related discussion on the underdetermined-ness of sentences).

Another interesting implication from this analysis comes from the extension of deixis to clausal arguments. Recall that in this analysis, the deictic argument has an option to be expressed descriptively, using a preposition phrase, a name, or a relative clause. This explains why demonstratives in English allow relative clauses to occur in the *R* slot, even for pronominal demonstratives where there is no noun to host the relative clause. The association of demonstratives with clausal complements is found across languages. Many languages make use of demonstratives as complementizers, like English *that*, and also use them in correlative structures. While it is not possible to give analyses of complementizer *that* or the correlative structure in this paper, the commonly-found association between demonstratives and clausal elements is not surprising given the account proposed here.

## 6. Conclusion

In this paper, I have proposed that the only semantically-relevant distinction between definites and demonstratives is the presence of a linker argument. While demonstratives are binary in taking both the descriptive content and the deictic content as arguments, definites only take descriptive content. Focusing on the notion of deixis allows us to delineate the semantic and pragmatic effects that are visible in the distribution of these expressions. Semantically, demonstratives allow at-issue and restrictive contribution from deixis and gestural content. Definites, on the other hand, do not allow such content to enter the noun-internal composition, leaving them as supplementary. When demonstratives take covert, anaphoric indices inside the linker slot, they overlap with definites in their use. This overlap has different implications for different kinds of languages. For languages like Mandarin where there is no overt marking of unary definites, the overlap and the resulting vagueness in the input may result in reanalyzing the demonstrative as a marker of a unary definite, which explains why Mandarin speakers allow bridging uses of demonstratives readily. For languages like English where there is an overt definite marker, pragmatic economy principles choose the simpler definite over the demonstrative, resulting in anti-uniqueness inferences when the demonstrative is used. I showed that this way of deriving anti-uniqueness has not only a theoretical advantage of minimizing stipulations but also an empirical advantage over previous, anti-uniqueness-based accounts: because it is only predicted to arise when demonstratives and definites overlap in meaning, it correctly predicts only anaphoric demonstratives to carry anti-uniqueness inferences. Finally, I argued for a general ban against sentence-internal semantic composition of different modalities of language, such as descriptive and deictic content. The role of the demonstrative is that of linking the two modalities, taking a particular-selecting depiction like deixis and turning it into a element that can compose with the rest of the descriptive content inside the noun. Analyzing demonstratives as modality linkers is compatible with different properties of demonstratives observed from typological studies as well as acquisition studies. First, because they fully specify an entity using deixis, demonstratives are universally found and acquired early in development. Second, because the deictic argument slot can also host descriptive content that can replace the deixis, demonstratives across languages take clausal arguments and appear in correlative structures.

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