

How Mutual Knowledge Constrains the Choice of Anaphoric Demonstratives in Japanese and English

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Abstract

It has been widely acknowledged that the choice of Japanese demonstratives (the distal *a*-series, the medial *so*-series, and the proximal *ko*-series) in their anaphoric use is regulated by the rules concerned with the interlocutors' knowledge of the referent. In cross-linguistic discussions of anaphoric demonstratives, on the other hand, the effect of the interlocutors' knowledge of the referent has not received such recognition. This paper has the following goals. First, it critically reviews Susumu Kuno's seminal analysis of Japanese anaphoric demonstratives, and presents a modified version of it. Second, it argues that the interlocutors' knowledge of the referent is relevant to the choice of the English demonstratives *this* and *that* too. Third, it provides a formal semantic analysis of anaphoric demonstratives in the two languages.

1 Introduction

Since Kuno (1973), it has been widely acknowledged in Japanese linguistics that the choice of demonstratives (the distal *a*-series, the medial *so*-series, and the proximal *ko*-series) in their anaphoric use is regulated by the rules concerned with the speaker's and the hearer's knowledge of the referent. In cross-linguistic discussions of anaphoric demonstratives (e.g., Diessel, 1999), on the other hand, the effect of the interlocutors' knowledge of the referent has not received such recognition.

The purpose of the current work is three-fold. First, it critically reviews Kuno's seminal analysis of Japanese anaphoric demonstratives, and presents

a modified version of it. Second, it argues that the interlocutors' knowledge of the referent is relevant to the choice of the English demonstratives *this* and *that* too. Third, it provides a formal semantic analysis of anaphoric demonstratives in the two languages couched in the Discourse Representation Theory (DRT) framework.

It should be noted, before we proceed, that our discussion will focus on usage of anaphoric demonstratives in typical, two-agent conversations (dialogue); the question of whether and how the presented analysis can be extended to other discourse types, such as soliloquy (monologue) and nonfictional prose, will be left open. Also, our discussion will not cover the cases of demonstratives that do not refer to a specific entity (e.g., the "donkey anaphora" case, as in: *If a man is in Rhodes, that man cannot be in Athens*).

2 Distinct Uses of Demonstratives

Demonstratives in many, if not all, languages have several distinct uses. We adopt Diessel's (1999) classification and terminology, where the uses of demonstratives are first divided into the *exophoric* and *endophoric* uses, and the latter is further divided into subtypes including the *anaphoric* use.

The exophoric use is widely thought to be the most basic. Exophoric demonstratives (or expressions containing them) refer to entities present in the discourse situation.¹

¹For the sake of simplicity, we will say "adnominal demonstrative X refers to Y" to mean "an NP modified by X refers to Y". For example, *this* in *I read this book* will be said to refer to a book, although more precisely it is the NP *this book* that does

Anaphoric demonstratives, on the other hand, are coreferential with a noun phrase in the preceding discourse and keep track of the referents already introduced to the discourse (and are not present in the discourse situation), as in (1).

- (1) My neighbor has a dog, and **{this/that}** dog kept me awake. (Gundel et al., 1993: 279)

Anaphoric demonstratives must be distinguished from *recognitional* and *discourse-deictic* demonstratives, two other major types of endophoric demonstratives. A recognitional demonstrative does not have an antecedent in the surrounding discourse and refers to an entity that is “discourse-new” but is identifiable for both interlocutors by virtue of their shared knowledge (e.g., *Do you still have **that** radio that your aunt gave you for your birthday?*; Diessel, 1999: 7). A discourse-deictic demonstrative refers to a proposition expressed by, or a speech act carried out by, a chunk (clause, sentence, etc.) of the surrounding discourse (e.g., *John is not here. — **That’s** {false/a lie}.*)

3 Anaphoric Demonstratives in Japanese

3.1 Kuno (1973) on Anaphoric Demonstratives

Japanese has a three-term system of demonstratives, which consists of (i) the proximal *ko*-series (“close to the speaker”), (ii) the medial *so*-series (“close to the hearer and distant from the speaker”), and (iii) the distal *a*-series (“distant from both”). Each series contains several forms with different syntactic categories and meanings, e.g., pronouns *kore/sore/are* ‘this/that one (insentient)’, adnominal modifiers *kono/sono/ano* ‘this/that’, and manner adverbs *koo/soo/aa* ‘in this/that way’.

There has been a vast amount of literature on anaphoric demonstratives in Japanese. Among the numerous existing studies, the chapter titled “the anaphoric use of *kore*, *sore*, and *are*” in Kuno (1973) has been one of the most influential. Regarding the contrast between the *a*-series and *so*-series, he essentially claims that the *a*-series is used to refer to an entity that both S (the speaker) and H (the hearer) know personally (know well, are acquainted with), and the *so*-series is used to refer to an entity that either S or H does not know personally (does not know so.

well, is not acquainted with). In accordance with these generalizations, in (2) an *a*-demonstrative is chosen to refer to a person that both S and H are acquainted with, and in (3) a *so*-demonstrative is used to refer to an individual that only one of the interlocutors (i.e., A) “knows personally”.²

- (2) A: Kinoo Yamada-san-ni hajimete
yesterday Y.-Suffix-Dat for.the.first.time
aimashita. **{Ano/*sono}** hito, zuibun
meet.Pst.Plt **{that_a/that_{so}}** person quite
kawatta hito-desu-ne.
strange person-Cop.Prs.Plt-DP
‘I met Yamada for the first time yesterday.
That_a man is a very strange person, isn’t he?’
B: Ee, **{Ano/*sono}** hito-wa
yes **{that_a/that_{so}}** person-Top
henjin-desu-yo.
eccentric-Cop.Prs.Plt-DP
‘Yes, that_a man is an eccentric.’
(adapted from Kuno, 1973: 283–284)

- (3) A: Watashi-no kinjo-ni
I-Gen neighborhood-Dat
Yamada-san-toiu hito-ga
Y.-Suffix-called person-Nom
sundeimasu. **{*Ano/sono}** hito-wa
live.Ipfv.Prs.Plt **{that_a/that_{so}}** person-Top
Porsche-o motteimasu.
P.-Acc own.Ipfv.Prs.Plt
‘I have a neighbor called Yamada. He_{so} owns a Porsche.’
B: **{*Ano/sono}** hito
{that_a/that_{so}} person
kanemochi-na-ndesu-ne.
wealthy-Cop.Attr-DAux.Prs.Plt-DP
‘So he_{so} is wealthy, I suppose?’

As for anaphoric *ko*-demonstratives, which are exemplified in (4), Kuno states that their referent must be something that S knows well but H does not, and

²The abbreviations in glosses are: Acc = accusative, Attr = attributive, Cl = classifier, Cop = copula, Dat = dative, DAux = discourse auxiliary, DP = discourse particle, Evid = evidential particle, Inf = infinitive, Ipfv = imperfective, Loc = locative, Neg = negation, Nom = nominative, Plt = polite, Pot = potential, Prs = present, Pst = past, Top = topic, Vol = volitional. Subscript *ko*, *so*, and *a* in the glosses/translations indicate that the corresponding Japanese expression is a *ko*-, *so*-, and *a*-demonstrative, respectively.

also point out that they add an emotional overtone to the utterance.³

- (4) Boku-no tomadachi-ni Yamada-toiu
I-Gen friend-Dat Y.-called
hito-ga iru-nda-ga,
person-Nom exist.Prs-DAux.Prs-and
{**kono/sono/*ano**} otoko-wa nakanaka-no
{this_{ko}/that_{so}/that_a} man-Top considerable
rironka-de ...
theoretician-Cop.Inf
'I have a friend by the name of Yamada, and
{this_{ko}/that_{so}} man is a theoretician of some
caliber, and ...'

(adapted from Kuno, 1973: 288)

3.2 Reconsideration of Kuno's Generalizations

While Kuno's analysis reviewed above captures well the way anaphoric *koso/so/a*-demonstratives contrast with each other, it leaves some room for refinements and elaborations. In the following, we address the following issues and present a modified version of Kuno's generalizations.

- (5) i. It can be shown that it is not "to know well/personally", but a weaker kind of cognitive relation (between an interlocutor and a referent) that affects the choice of the Japanese anaphoric demonstratives.
ii. Kuno does not explicitly discuss cases where neither S nor H knows (well) the referent.
iii. There are cases where a *so*-demonstrative is chosen despite its referent being known (well) to both S and H.

Our discussion here will have to be brief due to space limitation; see Oshima (2014) and Oshima and McCready (in preparation) for a fuller presentation and discussion of additional complications.⁴

³It is interesting to observe that *ko*-demonstratives of this kind have similarity with so-called "emotional-decitic" or "affective" demonstratives in English (Lakoff, 1974; e.g., *This Henry Kissinger really is something!*). A notable difference, however, is that *this* and *that* in their affective use tend not to have an explicit antecedent while an anaphoric *ko*-demonstrative needs one.

⁴The additional complications are mainly concerned with the use of an *a*-demonstrative for reference to an entity that H is not familiar with. It is observed in so-called *pseudo-soliloquy* (a type of speech that constitutes part of dialogue and yet is pre-

The borderline between "known" and "not known": The choice of Japanese anaphoric demonstratives largely hinges on the interlocutors' knowledge of the referent. Exactly what kind of knowledge matters, however, is a question that requires careful consideration.

To begin with clear-cut cases, entities such as one's close friends, personal items that one uses day-to-day, and places that one often visits will be the central cases of referents that are "known (well)". Also, as pointed out by Kuno (1973: 285), public figures (e.g., film actors, politicians) that one knows of through public media (e.g., magazines, TV) have a good potential to be treated as, or as if they were, "known (well)", as long as the choice of anaphoric demonstratives is concerned. A referent that an interlocutor came to know through hearsay (including the other interlocutor's previous utterances), on the other hand, is not regarded as "known (well)", so that reference to it is made with a *so*-demonstrative, as in (3B) above.

According to Kuno, entities that an interlocutor had only a casual encounter with and does not know well (e.g., a person that he met briefly on the street) constitute a borderline case, and it is possible for him (or his conversation partner) to refer to them with the *so*-series.⁵ This claim is hard to maintain, however, in view of data like the following:

- (6) (A and B go to the cinema together. During the movie, they hear the person sitting behind them sob loudly. After leaving the theater, they talk about this person.)

A: Ushiro-no hito naiteta-yone.

back-Gen person cry.Ipfv.Pst-DP

'The person sitting behind us was sobbing, wasn't he?'

B: {**Ano/*sono**} hito-no sei-de

{that_a/that_{so}} person-Gen cause-by

eiga-ni shuuchuu-dekinakatta-yo.

movie-Dat concentrate-do.Pot.Neg.Pst-DP

'I couldn't concentrate on the movie because

sented as if it were part of monologue), as well as in a discourse situation where (i) it is assumed that H is looking for an entity with some property P (e.g., a good piano instructor), and (ii) S introduces such an entity to H.

⁵See Oshima (2014: 9–10) and Oshima and McCready (in preparation) for discussion of the data which led Kuno — wrongly, in our view — to this conclusion.

of that_a person.’

Unacceptability of *sono* in (6B) shows that, contra Kuno, any kind of contact involving direct perception, even if it is as casual/slight as just hearing sobbing noise, implies that the referent is in the realm of “known (well)”. Henceforth, we will use the term “recognize”, in place of Kuno’s “know well/personally”, to refer to the relation that may hold between an interlocutor and a referent and that affects the choice between the three series of Japanese anaphoric demonstratives. Along with close friends and some public figures, entities that one has had some kind of perceptual contact with belong to the domain of “recognized”.

Reference to an entity that neither S nor H recognizes: Taken literally, Kuno’s generalizations (with an amendment on the relevant cognitive relation) predict that the *so*-series and not the other two series can be used to refer to an entity that neither S nor H recognizes. This is because that “neither S nor H recognizes the referent” logically entails that “either S or H does not recognize the referent” (where “or” is understood to be inclusive). This prediction needs to be empirically tested, however, because the data discussed by Kuno do not preclude the possibility that the *so*-series can be used only when one of the interlocutors knows well the referent and the other does not (cf. the discussion of English *this* in §4).

Data like the following show, however, that Kuno’s generalizations deal well with the situation where “neither S nor H recognizes the referent”. Such a referent can be referred to with a *so*-demonstrative, but not with a *ko*- or *a*-demonstrative.

(7) (A and B are helping with the organization of an academic conference as research assistants. They were told that another research assistant would join them in the afternoon, but they are not acquainted with him.)

A: Ato-de moo hitori kuru-yone. Kono
later more one.Cl come.Prs-DP this
shigoto-wa {sono/*ano/*kono} hito-ni
task-Top {that_{so}/that_a/this_{ko}} person-Dat
tanomoo.
ask.Vol
‘Another person will come in the afternoon,
right? Let’s ask that_{so} person to do this task.’

B: {Sono/*ano/*kono} hito-ga
{that_{so}/that_a/this_{ko}} person-Nom
kuru-no-wa
come.Prs-Pro-Top
nan-ji-da-kke?
what-o’clock-Cop.Prs-DP
‘What time is that_{so} person supposed to
come, again?’

Reference to an entity that (i) both S and H recognize but (ii) H does not know S recognizes: The use of the *so*-demonstrative in (8B) does not conform to Kuno’s analysis (the use of *ano* in this place is possible, but seems to be slightly less natural than that of *sono*).

(8) (A comes to visit B’s home.)

A: Ekimae-de keeki-o
station.front-Loc cake-Acc
katta-nda-kedo, sono mise-no
buy.Pst-DAux.Prs-and that shop-Gen
tenchoo-san, sugoku omoshiroi
manager-Suffix very interesting.Prs
hito-datta-yo. Sono hito, wakai
person-Cop.Pst-DP that person young.Prs
koro, Paris-de okashi zukuri-no
time P-Loc confectionary making-Gen
shugyoo-o shita-nda-tte.
training-Acc do.Pst-DAux.Prs-Evid
‘I bought some cake near the station. The
manager of the cake shop was an interesting
person. He told me that he received his training
as a confectioner in Paris in his youth.’

B: {Sono/(?)ano} hito, watashi-no
{that_{so}/that_a} person I-Gen
osananajimi-de, ima-demo, yoku
childhood.friend-Cop.Inf now-even often
issho-ni tsuri-ni ittari
together fishing-Dat go.Representative
suru-ndesu-yo.
do.Prs-DAux.Prs.Plt-DP
‘He is a childhood friend of mine. We still
hang out often, and do such things as going
fishing together.’

At the time (8B) is uttered, (interlocutor B knows that) the cake shop manager is recognized by both A and B, and thus, if Kuno’s analysis is taken at face

value, the use of the *so*-series must be blocked. Such data suggest that the choice between the three series of anaphoric demonstratives hinges not on whether (S knows that) the referent is recognized by S and H, but rather on whether it is *presupposed* (i.e., is considered a mutual knowledge of the interlocutors) in the discourse situation that the referent is recognized by both S and H.

Taking into consideration the points made above, we put forth the following generalizations:

- (9) i. The *a*-series can be used only if it is presupposed that both S and H recognize the referent.
 ii. The *so*-series can be used only if it is presupposed that either S or H does not recognize the referent.
 iii. The *ko*-series can be used only if it is presupposed that S recognizes the referent and H does not.

The (somewhat degraded) acceptability of the *a*-demonstrative in (8B) can be accounted for in terms of *pragmatic accommodation*. Upon hearing the use of *ano hito* in (8B), interlocutor A will quickly update the common ground — the collection of mutual knowledge of the discourse participants — adding to it the information that interlocutor B recognizes the referent.

4 Anaphoric Demonstratives in English

English has a two-term system of demonstratives, consisting of proximal *this* (and *these*) and distal *that* (and *those*). These forms can be used as a pronominal (nominal head), a nominal determiner, or a degree adverb (e.g., *this big*, *that expensive*).

This and *that* used anaphorically are often interchangeable, but sometimes they are not. Lakoff (1974: 350) remarks that *this* has a more colloquial tone than *that*, and suggests that the former is not permissible in (10a) for this reason.

- (10) a. John likes to kick puppies. {**That**/***this**} man's gonna get his one of these days!
 b. John likes to kick puppies. {**That**/**this**} man has been under surveillance by the SPCA for 5 years now.

It is possible to find, however, instances of anaphoric *this* occurring in colloquial discourse.

- (11) I've got a new roommate. I'll ask **this** guy if he'd be interested in buying your heap.

Gundel et al. (1993: 279) present another case, namely (12), where *that* cannot be replaced with *this*.

- (12) A: Have you seen the neighbor's dog?
 B: Yes, and {**that**/***this**} dog kept me awake last night.

They claim that anaphoric *this* is subject to the “speaker-activation” constraint, i.e., its referent must be something introduced to the discourse by S, as in (1) and (11), rather than by H.

An alternative way to account for the contrast between (1) and (12) is to suppose that *this* is subject to some constraint related to the interlocutors' mutual knowledge, so that it, like Japanese *so*- and *ko*-demonstratives, cannot be used to refer to an entity that (it is presupposed that) both S and H recognize (note that interlocutor A of (12), but not the hearer of (1), is assumed to recognize the dog in question).

This line of analysis seems to be applicable to the contrast between (10a) and (10b) as well. When one interprets discourse segment (10a) in isolation, it is most natural to presume that John is a mutual acquaintance of S and H. (10b), on the other hand, may be taken more easily to be an utterance where S describes some malicious person previously unknown to H.

It is furthermore possible to find evidence against the “speaker-activation”-based account. The following discourse segments show that *this* sometimes can be used to refer to a “hearer-activated” entity.

- (13) A: John has a pet tortoise.
 B: Oh really? How big is {**that**/**this**} tortoise?
 (14) A: My neighbor downstairs asked me if I'd be interested in buying opium.
 B: You should tell the police about {**that**/**this**} guy.

There are also cases where S has to choose *that*, rather than *this*, to refer to a speaker-activated entity. (10a) above is one such case, and (15) is an

additional example.

- (15) (Both S and H have driven Mary’s Corolla several times.)
 Mary decided to sell her Corolla. {**That**/***this**} car is now 20 years old, and she’s had it with all the maintenance problems it causes.

It seems thus that the “mutual knowledge”-based account is the more appropriate. What exactly, then, is the discourse-configurational constraint that *this* is subject to? As has been seen above with (13)/(14), unlike a *ko*-demonstrative, and like a *so*-demonstrative, *this* may be used to refer to an entity that H recognizes but S does not. *This* differs from a *so*-demonstrative, however, in that it cannot be used to refer to an entity that neither S nor H recognizes. Compare (7) with (16).

- (16) (the same situation as in (7))
 A: Another assistant will join us in the afternoon, right? Let’s ask {**that**/***this**} guy to do this task.
 B: What time is {**that**/***this**} guy supposed to come, again?

It can thus be concluded that the constraint on anaphoric *this* involves exclusive “or”: the referent needs to be recognized by S or H, but not by both. To put it differently, *this* signals *informational asymmetry* between S and H regarding the referent. Anaphoric *that*, on the other hand, is free from any kind of constraint that has to do with the interlocutors’ mutual knowledge. In more precise terms, these properties of *this/that* can be stated as follows:

- (17) i. *This* can be used only if it is presupposed that S or H, but not both, recognizes the referent.
 ii. *That* can be used whether or not it is presupposed that S and/or H recognize the referent.

From (17a,b), it follows that it is generally possible to replace anaphoric *this* with anaphoric *that*, but not vice versa.

5 Formal Analysis

This section formalizes the preceding discussion. There are many ways in which this project could be carried out; but given that our domain of inquiry is anaphoric demonstratives, it seems natural to make use of a theory of semantics formulated at the level at which discourse anaphora takes place. Consequently, in this paper, we will use Discourse Representation Theory (DRT; Kamp and Reyle, 1993; Kamp et al., 2011) as the framework for our discussion.

5.1 Preliminaries

In the interest of space, we will assume the reader’s familiarity with the basic components of DRT detailed in Kamp and Reyle (1993). For a brief reminder, in DRT, each (informative) sentence in a discourse introduces *conditions* and possibly *discourse referents* into a Discourse Representation Structure (DRS) in a form specified by a construction algorithm. Discourse referents are similar to logical variables, and serve as markers for entities asserted to exist within the discourse. A DRS K can be represented set-theoretically as an ordered pair $\langle U_K, C_K \rangle$, where U_K is the set of discourse referents (the *universe* of the DRS) and C_K is the set of *conditions* that are predicated of the discourse referents. However, DRSs are usually represented using a box notation for readability. For instance, the DRS for *A wolf howled* looks as follows:

(18)

x
$wolf(x)$ $howled(x)$

In the sequel, we will use $DRef$ for the set of discourse referents and $Cond$ for the set of conditions associated with a DRS.

In addition to the above, we need three more ingredients for the purposes of this paper: (i) a model for attitude ascriptions, (ii) a model for analyzing acquaintance with the particular objects the embedding function relates to discourse referents, and (iii) a model of presupposition. The second is obviously needed in order to characterize the kind of cognitive relation we have claimed to be necessary for the

use of some anaphoric demonstratives; the first is required to specify the desired notion of *establishment* of such acquaintance relations. We will now show how these elements are realized in DRT, in some detail since they will be key in our analysis. Finally, our formal analysis will treat the felicity conditions on anaphoric demonstratives in a way parallel to the treatment of other kinds of felicity conditions in the literature: as presuppositions (e.g. the treatment of ϕ -features in Kamp et al. 2011).

In recent versions of DRT, attitude ascriptions are modeled as attitudinal predicates which relate three elements: attitude holders, discourse representation structures (DRSs) K , and a function which maps (subsets of) $DRef$ directly to objects in the model, and thus have the form $Att(a, ADS, EA)$ for agent a , a so-called ‘Attitude Description Set’ ADS , and external anchoring function EA . The attitudinal predicate specifies that an attitude ascription is being made. The first argument is the attitude holder. The second argument, the ADS , specifies the content of the attitudes being ascribed. It consists of a set of pairs $\langle Mode, K \rangle$, where $Mode$ is an attitude specification which can be drawn from (at least) $BEL(ief)$, $DES(ire)$, and $INT(end)$, and K is a DRS. It is also possible here to have conditions of the form $\langle [Anch, x], K \rangle$, which specify that x as used in K is believed by the attitude holder to be anchored to some external object. Only BEL will play a role in our analysis. Finally, EA is a function which maps some subset of the discourse referents used in the conditions in the ADS to objects external to the discourse representation, i.e., to objects whose existence is independently known, or which are taken to be so.⁶

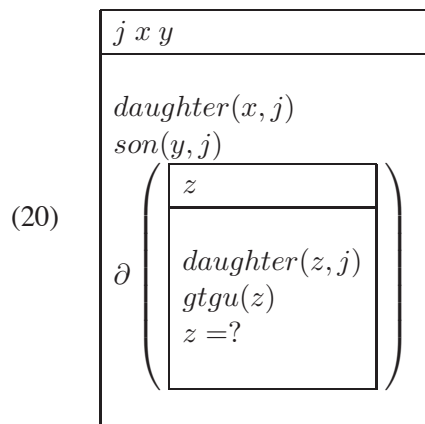
Our final task before proceeding to the analysis proper is to give background on treatments of presupposition within DRT. There is a large literature on this topic within DRT and dynamic semantics in general, with authors proposing varied treatments, but here we will present a treatment within more or less standard DRT following van der Sandt (1992), though differing from that work in some issues of representational detail. The basic idea of DRT views of presupposition is that presuppositions

⁶The model theory of these conditions is complex and its full explanation is beyond the immediate requirements of this paper. Full details can be found in Kamp et al. (2011).

are anaphoric objects which target elements already existing in DRSs by virtue of previous linguistic or nonlinguistic content. For an example of the intuition behind this approach, note that the presupposition of the possessive NP — that John has a daughter — is licensed in the discourse in (19) by virtue of the content of the first sentence.

- (19) John has a daughter and a son. His daughter is going to a good university next year.

Within DRT, this can be modeled by letting presuppositional expressions introduce special DRSs of the form ∂K . Such expressions are not integrated with the rest of the DRS, instead being resolved to other preexisting elements in the DRS. The discourse in (19), for instance, gets the representation in (20). The condition $z = ?$ indicates that z must be resolved to some contextual entity, if such resolution is possible.



A resolution algorithm then searches for an antecedent condition with the same content as the presuppositional DRS modulo substitution of variables.⁷ After such resolution, modeled by letting the unresolved variable $?$ in the condition $z = ?$ take on the value x , the presuppositional content is integrated; in a case like this one, where an antecedent expression exists, it is eliminated from the representation. However, if no suitable antecedent exists, the presupposed content is added to the DRS via accommodation when doing so does not result in inconsistency. This process is illustrated in the variant of the above in (21).

⁷This is a minor simplification; see van der Sandt (1992) and Beaver (1997) for a detailed discussion.

- (21) John has a family. His daughter is going to a good university next year.

In the DRS representing this discourse, no condition exists of the form *daughter*(*y*,*j*) for any variable *y*; thus, the presupposition cannot be resolved. However, since it is plainly consistent with the rest of the discourse, it can be accommodated.

It is worth mentioning finally the case of proper names, because of their close relation to demonstratives (e.g. Kaplan, 1989), though in the present paper we will not be able to address the issue of direct reference for reasons of space. In DRT, proper names are taken to introduce discourse referents which are associated with the presupposition that the name itself holds of that referent. They are thus a species of presuppositional indefinite. The discourse referent itself must be represented at the highest level of the DRS, and so must be mapped to some object in the model; it is not allowed to scope under operators such as negation. The presence of the referent at the top level may be achieved by accommodating the presupposition if required (cf. Beaver and Zeevat, 2007).

5.2 Japanese

Let us begin by reconsidering the constraints on Japanese anaphoric demonstratives from a DRT perspective. It can be seen that the basic ingredients required for a formal analysis are (i) an anchoring function, (ii) a way to separate the anchors associated with S and H, and (iii) a way to indicate the metalinguistic beliefs of S about the anchoring functions of the S and H.

This observation can be implemented as in (23), which provides a semantics for adnominal anaphoric demonstratives *ano/sono/kono*. Here, we have treated the constraints on these expressions as presuppositional in nature. The use of an adnominal anaphoric demonstrative introduces four things to a DRS: (i) a new discourse referent x_n , (ii) a condition requiring the resolution of that referent, $x_n = ?$, and two “true” presuppositions: one requiring x to satisfy the predication introduced by the nominal element, and one putting some constraint or constraints on the belief states of S and H, namely that they recognize, or do not recognize, the referent. We capture this by allowing individuals to have beliefs

about each other’s internal anchors and thus, indirectly, about each other’s anchoring functions. In the sequel, we will use conditions of the form (22) to indicate content of this kind; (22) can be read “*i* believes that *j* takes *x* to be externally anchored”.

$$(22) \text{ Bel}(i, \text{ Anch}(j, x))$$

The above condition abbreviates the usual DRT attitudinal representations discussed above. We can simplify this condition still further for our purposes here. In conditions of the form (22), the anchoring condition *Anch*(*a*, *x*) indicates that *a* takes *x* to be externally anchored; the remainder indicates that the attitude holder *i* takes *a* to take *x* to be anchored. In all the conditions we will use below, the attitude is claimed to be jointly held by S and H, and so part of the common ground. Given that this part of the condition is constant, we will eliminate it in our analysis proper, simply writing *Anch*(*j*, *x*).

Our semantics for the Japanese anaphoric demonstratives can then be stated as follows, with the adnominal modifiers *ano/sono/kono* used as the representative cases. In (23) and hereafter, $\{s, h\}$ represents the group of S and H, and so *Att*($\{s, h\}, \dots$) is a kind of commonly held attitude predicate. For the case of belief, the use of this argument indicates common belief of S and H (cf. van Ditmarsch et al., 2007).

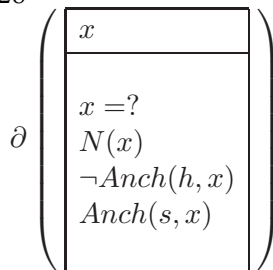
- (23) a. ‘*ano N*’ introduces a condition of the form

$$\partial \left(\begin{array}{c} x \\ \hline x = ? \\ N(x) \\ \text{Anch}(\{s, h\}, x) \end{array} \right)$$

- b. ‘*sono N*’ introduces a condition of the form

$$\partial \left(\begin{array}{c} x \\ \hline x = ? \\ N(x) \\ \neg \text{Anch}(\{s, h\}, x) \end{array} \right)$$

- c. ‘*kono N*’ introduces a condition of the form



This analysis takes the conditions on demonstratives to be essentially presuppositional. These conditions have three parts. First, a fresh discourse referent x is introduced within the DRS corresponding to the presupposition. This referent is then indicated to require an antecedent by the condition $x =?$. The core of the analysis comes in the remaining condition(s), which state the requirements on the anchoring of the variable. In (23a), the variable associated with the referent of an anaphoric demonstrative in the *a*-series is required to be jointly believed by S and H to be anchored for both of them.⁸ (23b,c) are similar to the above except for the attitudinal requirement. (23b) requires that S and H do not jointly believe that they both have anchors for x , as required by the conditions on the *so*-series, and (23c) requires that S is jointly believed to have an anchor for the variable, but that H is not.

The above seems to adequately capture the conditions we have claimed to hold of the Japanese anaphoric demonstratives. It should be noted that we must assume that presupposed conditions relating to attitudes can be resolved in the structures which are used to represent attitudes in DRT. To our knowledge, this sort of case has not been discussed in the literature, mostly because metalinguistic conditions of this kind involving mutual belief have not been the focus of much work in this area. We think that this is not problematic.

5.3 English

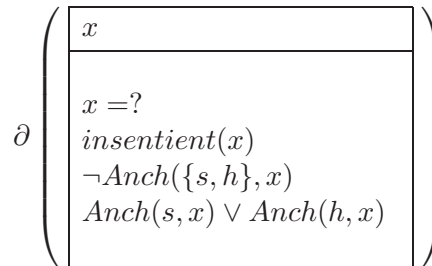
The English case, summarized in (17) above, is substantially simpler than the Japanese one. Each of the Japanese anaphoric demonstratives had a distinct condition (or set of conditions) associated with it, but for English we find that *this*-demonstratives are relatively tightly constrained in having both negative and positive conditions (as with the *ko*-series in

⁸Of course, this requirement is satisfied if the referent is jointly anchored.

Japanese), but *that*-demonstratives can be used quite freely.

The task of giving a formal analysis for English thus centers on the case of *this*-demonstratives. We propose the following semantics for *this*- and *that*-demonstratives; note that we focus on the (singular) pronominal case, which differs from the adnominal case discussed above for Japanese in lacking a presupposition associated with the nominal predicate. The adnominal case (of *this/that*) is analyzed by adding such a presupposition, while the Japanese pronominal cases can be analyzed by removing the presupposition that $N(x)$ from each clause of (23). The pronominal uses also have implications for the animacy/sentience of their referents; for instance, *are/sore/kore* in general cannot denote a sentient entity, and neither can pronominal *this/that* (except when they occur as the subject of *be*, as in: *That is his assistant.*), which we model by adding a presupposition that the referent is insentient.⁹

(24) a. '*this*' introduces a condition of the form



b. '*that*' introduces a new discourse referent x to *DRef* and the conditions $x =?$ and $insentient(x)$ to *Cond*.

Given what we have done in (23) for Japanese, the analysis of *this* is rather straightforward. (24a) states that *this* behaves like a kind of combination of the Japanese *so*-series and the *ko*-series demonstratives; like the *so*-series, it indicates that the referent is not jointly anchored, but like the *ko*-series, it indicates that it is anchored for one discourse participant, though it does not indicate which one. We have treated anaphoric *that*-demonstratives as essentially ordinary pronouns lacking anchoring restrictions. Both expressions presuppose that their ref-

⁹The interaction of animacy/sentience and the use of pronominal demonstratives is a rather intricate matter (e.g., Stirling and Huddleston 2002, 1504–1505), to which we cannot do full justice here.

erents are insentient. Note, though, that for both cases, adnominal uses require an extra specification; anaphoric demonstratives of the form *this/that N* also presuppose that $N(x)$, just as with the Japanese anaphoric demonstratives.

6 Conclusion

This paper has identified some difficulties with Kuno's (1973) analysis of the Japanese anaphoric demonstratives in the *a-*, *so-*, and *ko-* series, and presented a modified version of that analysis which accounts for a wider range of facts. This analysis was stated in terms of the interlocutors' knowledge of the referent which the demonstrative picks up; we have argued in addition that such knowledge is also relevant to the choice of the English demonstratives *this* and *that*. Finally, it has provided a formal semantic analysis of anaphoric demonstratives in the two languages stated in terms of pragmatic presuppositions on belief states, as modeled in the DRT framework. This work represents an advance on our current knowledge of anaphoric demonstratives, both in empirical and theoretical senses.

This work opens several avenues for future research. The first is the application of the current analysis to anaphoric demonstratives in other languages. We have argued that epistemic conditions on external anchoring constrain the choice of demonstratives in Japanese and English, but have not touched on other languages. The question of whether these factors also play into demonstrative use elsewhere is worthy of further investigation. Second, we have been careful to limit our analysis to the case of anaphoric demonstratives in dialogue. The constraints we have noted seem to behave in a subtly different manner in other discourse genres such as monologue or reportage; also, bound-variable uses of demonstratives also seem exempt from them, as in the case of donkey anaphora. The way(s) in which demonstratives are used across the full range of genres, and how the constraints on their use interact with constraints on other types of nominal expressions, is also a useful area for later research. Finally, it would be interesting to attempt the integration of the results of this paper with computational models of discourse generation and interpretation.

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