Revisiting presuppositional accounts of homogeneity *

Jad Wehbe

Massachusetts Institute of Technology
jadwehbe@mit.edu

Abstract

Homogeneity effects with definite plurals have been argued to constitute a phenomena that is distinct from other types of truth-value gaps [Kri15, KS21]. This paper makes the case for a return to early accounts of homogeneity that treat it as a presupposition. I provide empirical support for this view by showing that homogeneity is sensitive to constraints on presupposition accommodation. I argue that connectedness [EC21] mediates the distribution of local accommodation and that the differences between standard presuppositions and homogeneity are due to the fact that only the latter is non-connected (c.f. [Fox18], which argues for an alternative based on plausibility considerations).

1 Introduction

Definite plurals give rise to an intuitive truth-value gap known as *homogeneity*. Consider (1): neither (1-a) nor its negated counterpart in (1-b) are true in a scenario where Mary read only some of the books. Early accounts of homogeneity treated it as a presupposition [Sch93, Löb00, Gaj05], illustrated in (2)[1], but this assumption has recently been challenged.

(1) a. Mary read the books is **true iff** Mary read **all** the books.
b. Mary didn't read the books is **true iff** Mary read **none** of the books.
c. **Neither is true** iff Mary read only some of the books.

(2) **Homogeneity presupposition:** Given a distributive predicate P and a plural individual x, P(x) is defined iff $\forall y \leq_{\text{AT}} x : P(y) = 1 \vee \forall y \leq_{\text{AT}} x : P(y) = 0$

A major challenge for the presuppositional approach are differences in projection between homogeneity and standard presuppositions [Spe13, Kri15]. For example, it is well-known that presuppositions project from polar questions and from the antecedents of conditionals, but homogeneity does not seem to pattern with presuppositions in these environments (3).

(3) a. If Mary read the books, she passed the exam.
$\not\rightsquigarrow$ Mary read all or none of the books.
b. Did Mary read the books?
$\not\rightsquigarrow$ Mary read all or none of the books.

Furthermore, homogeneity violations aren't perceived in the same way as presupposition violations. Given a context where the presupposition is not entailed by the common ground such as (4-a), the addressee can object by responding with something like *Wait a minute! I didn't even know that Mary used to smoke* [vF04]. On the other hand, (4-b) does not impose this requirement on the common ground and therefore does not license the same kind of response.

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[1] Throughout the paper, I will focus only on homogeneity with distributive predicates. Additionally, I abstract away from non-maximal interpretations of definite plurals. Both homogeneity with non-distributive predicates and the role of non-maximality should be considered more thoroughly in future work.

(4) a. **Context:** B does not know that Mary used to smoke.
A to B: Mary stopped smoking.
b. **Context:** B doesn't know whether Mary read all, some or none of the books.
A to B: Mary read the books.

In this paper, I will argue that homogeneity is a presupposition, despite these differences. In section 2, I show that homogeneity is sensitive to constraints on presupposition accommodation. In section 3, I argue that obligatory local accommodation with homogeneity in cases like (3-a) and (3-b) can explain the lack of projection and propose that these differences in projection follow from the fact that homogeneity gives rise to non-connected propositions (in the sense of [EC21]), while standard presuppositions are generally connected.

2 Constraints on accommodation

Heim observes that questions can't be answered with an accommodated presupposition [Hei15]. Consider (5): the only difference between (5-b) and (5-c) is that part of the information in (5-c) is presuppositional. The presupposition of (5-c) (*That someone adopted the Lab*) is not met in the context, but given the availability of global accommodation, this alone can't explain the infelicity. Heim argues that examples like (5-c) are infelicitous because accommodating the presupposition settles A's question, making the assertion trivial with respect to the QUD.

(5) **Context:** A is visiting a dog shelter and is interested in adopting a Lab that she saw the week before when passing by the shelter. She comes back and asks an employee:
a. A: Can I adopt the Labrador?
b. B: Someone from NY adopted the Lab.
c. B': #It is someone from NY who adopted the Lab. [AFH22] (slightly modified)

We can therefore make explicit the constraint on accommodation in (6), which follows from an asymmetry between the pragmatic status of presuppositions and assertions [DW22]. Taking PAI as a diagnostic for presuppositions, we can apply it to homogeneity. If homogeneity is a presupposition, we expect definite plurals to be infelicitous given a common ground where accommodating homogeneity makes the assertion uninformative.

(6) **Post-Accommodation Informativity (PAI):** A sentence S_p (presupposing p) can be uttered felicitously only if S_p is informative w.r.t. the common ground and QUD after presupposition accommodation. [DW22]

This prediction is borne out in (7-a). Given a common ground that entails that Jane read at least some of the blue books, accommodating the homogeneity presupposition (*She read none or all of the blue books*) makes the assertion (*She read the blue books*) trivial, regardless of the QUD. Therefore PAI correctly predicts the infelicity of (7-a). Compare with the counterpart with *all* which lacks homogeneity and is felicitous (7-b).

(7) **Context:** Mary and Bill were observing which books Jane is reading among a collection of blue and red books. They saw Jane read 3 out of the 6 blue books, but then Mary had to leave. Bill stayed and saw Jane finish all the blue books. Mary comes back to the room and is wondering which books Jane ended up reading. Bill reports:
a. B to M: # She read the blue books.
b. B to M: She read all the blue books.

In order to get a sharper contrast, consider the example in (8) (Bassi, p.c., atribb. to Schwarzschild), where the common ground that would license accommodation is not conceivable. Since it is common knowledge that Bill can't be married to all of his teammates, accommodating the homogeneity presupposition makes the assertion in (8-a) trivial, violating PAI.

(8) a. # Bill isn't married to his teammates.
b. Bill isn't married to any of his teammates.

In joint work with Omri Doron [DW22], we argue for a version of this constraint that applies also to local accommodation. Looking at conditional antecedents, a conditional is only felicitous if the common ground doesn't entail its antecedent. We argue that this requirement has to be evaluated after local accommodation: if the antecedent is trivial after accommodating its presupposition, local accommodation is not allowed. This is illustrated by the unavailability of local accommodation in cases like (9): given that it is common ground that Mary doesn't smoke now, once we accommodate the presupposition of the antecedent (*Mary used to smoke*), the antecedent proposition (*Mary stopped smoking*) is trivially true, violating PAI.

(9) I know that Mary doesn't smoke now. # I don't know if she used to smoke, but if she stopped smoking, she must be very brave.

Homogeneity is also sensitive to this constraint when the definite plural is in the antecedent of a conditional (10). Note that this is an environment from which homogeneity doesn't project and therefore has to be locally accommodated if it is a presupposition (see section 3). In (10), given a common ground where Jane read at least some of semantics books, accommodating the homogeneity presupposition makes the antecedent trivially true, violating the constraint.

(10) **Context:** A and B were looking at Jane, and they saw that she has read 3 out of the 6 semantics books on the reading list, but they're not sure if she read the rest of them.
a. A to B: # If she read the semantics books, she will pass the exam.
b. A to B: If she read all of the semantics books, she will pass the exam.

We therefore see that homogeneity is sensitive to the same constraints on accommodation as presuppositions, even in environments where a homogeneity presupposition would have to be locally accommodated. This parallel between homogeneity and presuppositions provides evidence that homogeneity is in fact a presupposition.

3 Connectedness and homogeneity

Starting with the assumption that homogeneity is a presupposition, I will show in this section that the projection patterns with homogeneity can be explained we constrain the distribution of local accommodation in the right way, building on [Fox18].

I assume that sentences with presuppositions denote trivalent propositions and that local accommodation is due to the application of the A-operator (11). Note that A can also be inserted at the matrix level, collapsing the presupposition and assertion [SRHF12, Fox13].

(11) $$[\![A]\!](\mathrm{p}) = \begin{cases} 1 \text{ iff } p = 1 \\ 0 \text{ iff } p = \# \vee p = 0 \end{cases}$$ [Boc81]

Let's consider the unembedded case, the antecedent of conditionals and the scope of non-monotonic quantifiers as case-studies. In each of these, the parse in bold derives the desired truth-conditions [2]. In the unembedded case (12), obligatory local accommodation (A) at the matrix level (Parse 2) explains the differences between how homogeneity violations and presupposition violations are perceived. In the antecedent of conditional (13), obligatory local accommodation in the antecedent (Parse 2) derives the lack of projection. Finally, in the scope of non-monotonic quantifiers (14), preference for matrix A (Parse 1) over embedded A (Parse 2) explains the fact that homogeneity does project [KC15]. The challenge is how to constrain the distribution of the A-operator such that the correct parses are predicted.

(12)	Parse 1: Mary read the books. 1 iff Mary read all of the books. 0 iff Mary read none of the books. # iff Mary read only some.	**Parse 2**: A(Mary read the books) 1 iff Mary read all of the books. 0 iff Mary didn't read all of the books. # never

(13) a. Parse 1: A(If Mary read the books she passed the exam).
1 iff Mary read none or all of the books and if she read all of them she passed.
b. **Parse 2**: If A(Mary read the books), she passed the exam.
1 iff if Mary read all of the books she passed.

(14) a. **Parse 1**: A(Exactly one student read the books).
1 iff Exactly one student read all of the books and all the other students read none.
b. Parse 2: Exactly one student 1 A(t_1 read the books).
1 iff Exactly one student read all of the books.

Enguehard and Chemla propose that there is a general preference for connected propositions and apply this to the distribution of exh [EC21]. They define connectedness as shown in (15), where a proposition is non-connected if there is a world where it is false ordered between worlds where it is true. They propose that parses where the application of exh results in non-connected meanings are dispreferred, which helps explain certain facts about the distribution of exh.

(15) Given an ordering $\leq$ a proposition p is non-connected iff:
$\exists w_1, w_2, w_3$ s.t. $w_1 \leq w_2 \leq w_3 \wedge p(w_1) = 1 \wedge p(w_2) = 0 \wedge p(w_3) = 1$

I propose that connectedness constrains the distribution of the A-operator in a similar way. Given different parses of a sentence with or without the A-operator, I propose that parses which denote a non-connected proposition are dispreferred. Moreover, all else being equal, global accommodation is preferred to inserting A [Hei83] and A is preferred to occur as high as possible. Crucially, connectedness considerations override the preference for global accommodation and for matrix A over embedded A, such that for example if the parse without A is non-connected while the parse with A is connected, the latter is preferred.

In order to apply the notion of connectedness to trivalent propositions, I provide a generalized definition of connectedness in (16). Roughly speaking, a trivalent proposition is non-connected if either the assertive component (a) or the presupposition (b) is non-connected.

(16) **Connectedness for trivalent propositions**: A trivalent proposition p is non-connected iff
a. $\exists w_1, w_2, w_3$ s.t. $w_1 < w_2 < w_3 \wedge p(w_1) = 1 \wedge p(w_2) = 0 \wedge p(w_3) = 1$ **or**
b. $\exists w_1, w_2, w_3$ s.t. $w_1 < w_2 < w_3 \wedge p(w_1) = 1/0 \wedge p(w_2) = \# \wedge p(w_3) = 1/0$

We can now apply this to the problem of homogeneity projection. Consider a context with two books, 1 and 2. Assuming that worlds where Mary read only one of the books are ordered

[2] I assume that presuppositions project universally from the scope of non-monotonic quantifiers

between worlds where she read neither and worlds where she read both, we predict that the parse 1 in (12) is non-connected: there are worlds where p=# ordered between worlds where p=1 and worlds where p=0 (Figure 1, where w_{xy} corresponds to a world where Mary read x and y.). On the other hand, Parse 2 with the A-operator at the matrix level is connected (figure 2), so we successfully predict that the latter is the only available parse in (12). This predicts the fact that homogeneity does not impose any requirements on the common ground.

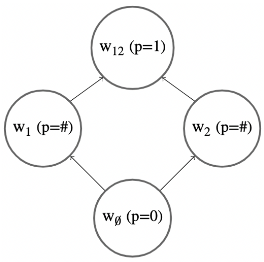

Figure 1: p= Mary read the books

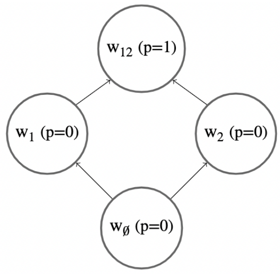

Figure 2: p= A(Mary read the books)

One question that immediately arises is how the ordering of worlds is determined. Given a set of propositions, an ordering of worlds can be generated as illustrated in (17), following [Kra81]. I assume that the ordering in Figure 1 and 2 is determined by the domain alternatives to the sentence with the definite plural. The resulting ordering source for (12) is given in (18).

(17) Given a set of propositions OS, $w_1 <_{\text{OS}} w_2$ **iff**
$$\{p \in \text{OS} : p(w_1) = 1\} \subset \{p \in \text{OS} : p(w_2) = 1\}$$

(18) OS= { Mary read book 1, Mary read book 2 }

This proposal is similar in spirit to [Fox18], who argues that plausibility consideration mediate the distribution of the A-operator with homogeneity. One crucial difference is that Fox's account predicts that homogeneity projects differently in different contexts, while the connectedness proposal does not predict any context-dependence. In forthcoming work, I provide evidence that homogneity projection does not in fact depend on plausibility.

Turning to the conditional antecedent case, given the same ordering source in (18), the only parse that results in a connected meaning is the one where A is inserted in the antecedent (13-b). This predicts that (13-b) is the only available parse, and therefore that homogeneity doesn't project from the antecedents of conditionals. The parse with matrix A in (13-a) is non-connected (Figure 3): the resulting proposition is false in worlds where *Mary read only some of the books and passed* which are ordered between worlds where *Mary read all of the books and passed* (p=1) and worlds where *Mary read none of the books and passed* (p=1).

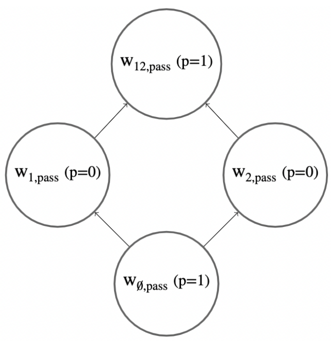

Figure 3: p= A(If Mary read the books, she passed.)

On the other hand, the parse with A in the antecedent (13-b) is connected given the OS in (18), because the worlds where the resulting proposition is false are worlds where Mary read both books but failed, in which both propositions in the ordering source are true. The worlds where p is false are therefore not ordered between any two worlds, making (13-b) connected. Note that the alternative ordering source in (19) would make the parse in (13-b) also non-connected, which would incorrectly predict that global accommodation is preferred, given the general preference for global accommodation. The success of this account therefore depends on the details of the ordering, which have to be motivated more thoroughly in future work.

(19) Alternative OS= { Mary read book 1, Mary read book 2, Mary passed the exam }

Finally, consider a case where homogeneity projects from an embedded environment: the scope of non-monotonic quantifiers. Here, the parse where A is inserted at the matrix level is connected, assuming the ordering source in (20). Given a toy example where there are only two students A and B, the resulting ordering is given in Figure 4, where there is no world that is ordered between the worlds where p=1 (in gray). Given that all else being equal matrix A is preferred over embedded A, we successfully predict that homogeneity does project here.

(20) Ordering source= $\{x$ read y $|x \leq_{AT} [\![\text{the students}]\!] \wedge y \leq_{AT} [\![\text{the books}]\!]\}$

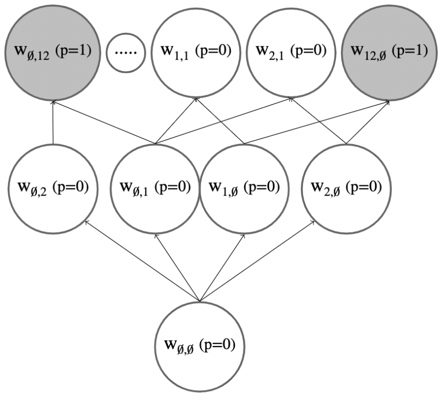

Figure 4: p= A(Exactly one student read the books) (subscript m,n indicates that student A read book m and student B read book n.)

4 Conclusion

After presenting evidence that homogeneity is sensitive to constraints on presupposition accommodation, I proposed that the differences in projection between homogeneity and standard presuppositions can be reduced to a difference in the properties of the proposition that projection gives rise to. Namely, homogeneity projection often results in non-connected propositions which can be made connected by local accommodation. On the other hand, standard presuppositions are generally connected and therefore, unlike homogeneity, do not exhibit this kind of obligatory local accommodation.

The idea behind this proposal is that the disjunctive nature of the homogeneity presupposition results in a type of oddness (formalized as non-connectedness) which can be rescued by inserting A. More broadly, we can take this as a case-study showing that projection can sometimes be misleading as a diagnostic of presuppositions. Constraints on accommodation like PAI offer an alternative diagnostic which does not rely on projection.

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