

Optionality in the use of *too*: the role of reduction and similarity

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Este artigo lida com a propriedade da obrigatoriedade que é frequentemente descrita como uma característica da classe das partículas aditivas (e.g., o advérbio *too* (“também”). Em resumo, essas partículas são chamadas de obrigatórias porque omiti-las em um discurso criaria ou um resultado infeliz ou a derivação de inferências indesejadas. Uma linha comum de análise trata essa propriedade como booleana. O consenso geral costuma ser que se uma partícula aditiva pode ser usada num discurso, então ela tem que ser usada. Contudo, alguns exemplos mostram que essa propriedade provavelmente recebe um melhor tratamento como sendo gradiente. Neste trabalho, investigaremos algumas das condições que afetam essa obrigatoriedade. Em primeiro lugar, baseado em um pequeno experimento com corpora, avaliaremos a frequência dos usos obrigatórios e opcionais de *too*. Depois, tendo estabelecido que os casos opcionais não são excepcionais, apresentamos resultado de um experimento que avalia o efeito da elipse e da anáfora na obrigatoriedade das partículas aditivas.

1. Empirical domain: *too*, similarity and obligatoriness

The distribution of additive particles like *too* offers a theoretical puzzle. Many analyses of *too* describe its semantics in simple presuppositional terms (mostly following the initial proposal by Horn (1972)) summarized as follows:

- (1)
- a. *too* has no asserted content by itself: it does not change or contribute to the main content of its host sentence.
 - b. *too* presupposes that there exists an element distinct from its associate that satisfies the same predication.

Thus in (2a), the use of *too* presupposes that someone different from Mo had fish, which is satisfied by the first segment of the discourse. Moreover, the use of *too* is not just possible, it appears to be *obligatory*: omitting *too* degrades the sentence, cf. (2a) vs. (2b).

- (2)
- a. Jo had fish, and Mo did *too*.
 - b. #Jo had fish, and Mo did. (Green, 1968)

Although (2b) might be acceptable with a specific prosody, there is a clear contrast with (2a). This observation is rather surprising since the similarity of the two segments is evident in (2a).

Obviously, Mo is not the only one who had fish, yet it appears more natural to redundantly mark this information with an additive particle which, under the description in (1), is not informative at all.

Additive particles can also be used in contexts where no antecedent has been explicitly mentioned. In those cases, additive particles are felt to convey that the discourse segments they relate are similar. Thus (3a) is felicitous because traveling a lot can easily be construed to be *similar* to seeing a lot of countries.

On the other hand, (3b) is not felicitous because the predications of the two segments are seen as incompatible since one is the antonym of the other.

(3)

a. John_{ct} traveled a lot and Mary_{ct} has seen lots of countries too.

b. #John_{ct} left and Mary_{ct} stayed too.

.

When an antecedent is not explicitly mentioned, the use of *too* does not appear to be as obligatory as in (2a). Thus in (4), the version without *too* is not ill-formed, but it yields a very different inference than the version with *too*.

(4)

[The 5000 m race was won by Gianni Romme.]

a. The 1500 m race was won by a Dutch skater

→ G. Romme is **not** Dutch.

.

b. The 1500 m race was won by a Dutch skater too.

→ G. Romme is Dutch. (*Sæbø, 2004*)

.

If it is not known whether Gianni Romme is Dutch, then (4a) conveys that he has a different nationality. On the other hand, if it is otherwise known that Gianni Romme is Dutch, then the pressure to use *too* is high, and (4a) might even appear degraded because of a clash between an inference and world knowledge. Another case where the use of *too* is optional is given in (5).

(5)

Hartmann's joy was apparent in his beautifully cut hair, his expensive suit, his manicured hands, the faint aura of cologne that heralded his approach; in his mild and habitually smiling face, too, his expressive walk, in which the body, leaning slightly forward, seemed to indicate amiability. (*Winterstein and Zeevat, 2012*)

.

In (5) the use of *too* appears to mostly be a stylistic choice by the author. The same passage without *too* appears not only acceptable, but almost unchanged in terms of meaning and discourse structure. Unlike in (4) the omission of *too* would not give rise to an inference that might clash with world knowledge. What makes the use of *too* optional in (5) is the fact that its two arguments are not perfectly identical as they are in (2a). This can also be seen by omitting *too* in (3a).

(6)

John_{ct} traveled a lot and Mary_t has seen lots of countries.

While (6) may not be as natural as (3a), the contrast is not as stark as in(2a).

The picture that emerges is that the obligatoriness of *too* is mediated by the perception of similarity. The more similar the segments, the more obligatory the use of *too*. This means that there might be cases where the similarity is up for debate, which would correspond to cases where the use of *too* is *optional*. This is illustrated on Fig. 1.

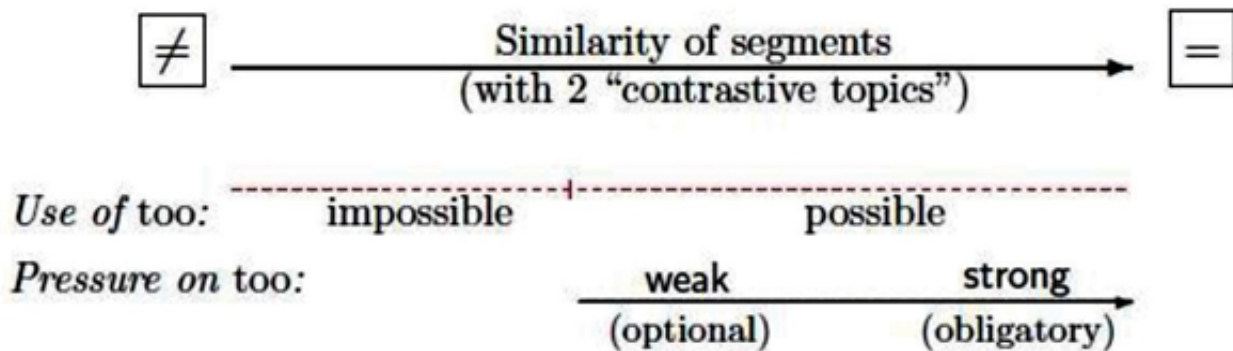


Figure 1. FIGURE 1: Obligatoriness of *too* and similarity

Similarity is understood here as a gradable property: an element can be more or less similar to another one. This entails that the use of an additive particle is possible only if the similarity exceeds some given threshold. If the similarity exceeds a higher threshold, then its use becomes *obligatory*, as in (2a).

The question then is which are the factors that affect the similarity of two discourse segments.

The simplest way to look at it is to assume a description of the semantics of *too* as in (1). Under this account, similarity is reduced to a question of entailment. We will use the following notation:

1. *H* is the denotation of the host of *too*
2. *p* is the content of the presupposition of *too*
3. *A* is the denotation of a discourse span that comes before *H*

A will then be similar to *H* if *A* implies *p*. In other words, the question of similarity is reduced to the question of whether one can derive *p* from *A*. In cases like (2a) the relation is immediate. In cases like (4) the implication depends on world knowledge which explains why (4a) is acceptable if one does not know that Gianni Romme is Dutch. Under such an account, the distribution of *too* can be summarized as follows:

(7)

a. If the presupposition of *too* is already part of the common ground then its use is mandatory because there is a maximally similar element that is present.

b. If the presupposition is not fulfilled, it cannot be accommodated (unlike most presuppositions) and hence the use of *too* is not licensed. This accounts for the impossibility to use *too* “out of the blue” (Kripke, 2009; van der Sandt and Geurts, 2001).

The description given in (7) is usually motivated by principles such as *Maximize Presupposition!* (Singh, 2008). The basis of the argument is that the absence of *too* in a sentence triggers the inference that the elements in presence are not similar (sometimes called an *antipresupposition* (Percus, 2006)). This clashes with contexts where the similarity is obvious, which makes the use of *too* obligatory in order to block the unwanted inference. There are however a number of reasons why such accounts are too simplistic. We mention only two here. First, there are cases where the presupposition of *too* is satisfied and yet the use of *too* is not felicitous (8).

(8)

#John was almost on time. Paul was late too. (*Winterstein, 2010*)

In (8) the use of the additive *too* is degraded. Yet an antecedent is available for satisfying *too*'s presupposition in the form of a conventional implicature attached to *almost* (cf. (Jayez and Tovená, 2008) on the semantics of this item)¹

We won't have much to say about those cases, and we will rather focus on a second group of problems for the accounts summarized earlier, namely the cases where *too* is optional.

For instance, in (9), it seems that *too* is not obligatory:

(9)

Jean est malade, Marie es tmalade, Paul est malade, tout le monde est maladealors !

John is sick, Marie is sick, Paul is sick, everybody is sick then!

Example (9) differs from those in (4) in that the antecedent is not a matter of world knowledge. There clearly are candidates to license the use of *too*. In such a case, though, it seems that discourse structure plays a role to explain that *too* is not obligatory (cf. (Amsili and Beyssade, 2010)). But there are other cases where the discourse structure does not seem to be what matters as in (5) where the use of *too* is mostly a stylistic choice.

All those cases are problematic for the accounts summarized in (7), because these accounts do not offer any real space for the optional uses of *too* since their only parameter of variation is whether the presupposition is part of the common ground or not.

Therefore, a more elaborate approach to the semantics of additive particles appears warranted. What is required is an approach that teases apart the presupposition encoded by *too* and its similarity constraint (Amsili and Beyssade, 2010; Winterstein and Zeevat, 2012). This provides a way to account for the optional cases by assuming that the pressure for using *too* is mediated by the similarity of its arguments independently of the presence of an antecedent for the

presupposition.

This prompts the question of the nature of similarity and the factors that affect it. This question was addressed early on by Kaplan (1984) who claims that the degree of obligatoriness varies with a series of parameters. More recently, Eckardt and Fränkel (2012) experimentally confirmed theoretical hypotheses by Amsili and Beyssade (2010) about the links between discourse structure and the pressure to use additive particles.

In this work we investigate the case of similarity and optionality in two ways. First, we try to demonstrate the reality of the optional cases in a more rigorous way by relying on corpus studies (Sect. 2). Second, we present the results of an experiment based on the proposal by Kaplan (1984) about the parameters that influence the obligatoriness of *too*, namely on the effect of ellipsis in the sentence that hosts *too* (Sect. 3) [2](#).

2. Corpus study: is *too* removable?

2.1. Motivation

It is rather delicate to assess whether an item is obligatory. To simplify the problem, a first step can be to define a set of conditions under which the item is thought to be obligatory. In the case of *too*, the original works were concerned with a very limited number of contexts, illustrated in (10). Two parallel sentences, connected with *and* (or *but*), with the same VP (sometimes ellided) applied to two different subjects (which often function as contrastive topics).

(10)

\underline{X}_{ct} VP, and \underline{Y}_{ct} (VP/did) ?(*too*)

.

In such a specific context, assessment is considerably easier, as exemplified in the experimental investigation in section 3. However, the intuition is that *too* is obligatory in a much larger set of situations, which only very vaguely fit the schema in (10), if at all. For instance, here is a real example from the literature, where the use of *too* is clearly legitimate, even though it does not fit the schema in (10). Another instance not fitting the schema in (10) was given in (5) above.

(11)

Swift Deer could see pine-clad mountains on the other side of the Rain Valley. Far away to the east and west the dry prairies stretched out as far as the eye could see. To the north lay the yellow-brown desert, a low belt of green cactus-covered ridges and distant blue mountain ranges with sharp peaks. To the south *too* he could see mountains. (*Sæbø, 2004, ex(1)*)

.

One way to solve the problem would be to try and define as precisely as possible the kind of contexts where *too*'s conditions of use are met, and then find or construct examples that match those conditions of use and prove that *too* is obligatory. This is probably an interesting track to follow, but it requires a precise description of *too*'s conditions of use, which does not exist yet. There is another, easier way, consisting in looking at naturally occurring examples with *too*, and check whether the adverb can or cannot be removed. This is less satisfactory, but at the present stage where it is not even known to what extent we can claim that *too* is obligatory, it will still tell us something about the phenomenon.

We took inspiration from a corpus study to which Winterstein and Zeevat (2012) only allude. The idea was to collect examples where *too* is found, try to leave it out and judge whether the omission has any effect: “A small probe of this kind by one of the authors on the English utterances of the Oslo Parallel Corpus gives obligatory cases and optional cases in roughly the same frequencies” (Winterstein and Zeevat, 2012). More precise figures are not given, so it was decided to perform a similar study with a French corpus.

We tried first a pure introspection study, with a small set of naturally occurring samples, which proved more difficult than expected, and this led us to perform several annotation studies, to get more reliable results. Unfortunately, as will be shown in the next sections, the final outcome is slightly disappointing. What we learn from those studies is (1) that there are a number of cases where *too* is **not** obligatory, and (2) that there is no agreement among speaker as to what those cases are exactly.

2.2. Three studies

2.2.1. Manual exploration of the data

The chosen corpus is a novel from Jules Verne, *Cinq semaines en ballon*, published in 1863 (J. Hetzelet Compagnie), which contains roughly 82 000 words. The number of additive particles proved surprisingly low: in total, 10 occurrences of additive *aussi* (*too*), one occurrence of its negative polarity counterpart *non plus* (*either*), 7 occurrences of *également* (*~also*), and 9 occurrences of *de nouveau* (*~again*). Other additives, which occur even less frequently, were left aside.

When we tried to classify our samples, we discovered very early that in addition to the expected optional or obligatory cases, there were cases where the initial version (with *too*) and the amended version (without *too*) were both well-formed discourses, with differences as to the kind of inferences that could be drawn. So we chose to establish a three-way distinction, among the cases where:

1. there is no difference between the discourses once *too* is removed (**optional** cases): ex. (12) or (5);
2. the discourse without *too* becomes ill-formed (**obligatory** cases): ex. (13) and arguably (11);
3. removing *too* gives rise to new inferences, i.e. inferences that do not belong to the original text (**inferential** cases): ex. (14).

(12)

Il se munit de trois ancrées en fer bien éprouvées, ainsi que d'une échelle de soie légère et résistante, longue d'une cinquantaine de pieds. Il calcula également le poids exact de ses vivres;

He took three solid iron anchors as well as a silk ladder both light and resistant, some fifty feet long. He ÉGALEMENT calculated the exact weight of his food.

(13)

- Si nous étions à bonne portée, dit le chasseur, je m'amuserais à les démonter les uns après les autres.

- Oui-da! répondit Ferguson; mais ils seraient à bonne portée aussi, et notre Victoria offrirait un but trop facile aux balles de leurs longs mousquets;

- *If we were at good range, said the hunter, I would enjoy taking them down each at a time.*

- Truly! Answered Fergusson; but they would be at good range AUSSI, and our Victoria would offer too easy a target for the bullets of their long rics;

.

(14)

- (. . .) cespeupladesontconsidéréescommeanthropophages.

- Celaest-ilcertain ?

- Très certain; on avaitaussiprétenduquecesindigènesétaientpo urvusd'une queue comme de simples quadrupèdes; mais on a bientôtreconnuquecetappendiceappartenait aux peaux de bête dontilssontrevêtus.

- (. . .) these folks are said to be anthropophagous.

- Is this certain?

- Quite certain; it was AUSSI said that these natives had a tail like simple quadrupeds; but soon it was recognized that this appendage belonged to the skins that they were using as cloth.

.

In the last example, two statements are presented about the *peuplade* (primitive people) the speakers are talking about: one true statement (they are anthropophagous), one false (they have a tail). The adverb *too* seems to serve the role of showing that the two descriptions are two *different* statements; without *too*, the discourse suggests that being anthropophagous and having a tail should count as one statement. This is the kind of additional inference coming from the absence of *too* that lead us to classify this sample as neither obligatory nor optional.

The results of the manual study are summarized in table 1.

Optional	9	33%
Obligatory	ill-informed 11	66%
	inference 7	

Table 1. TABLE 1: Manual classification of 27 samples with an additive

This manual study revealed a number of issues: Firstly, the presence of a large proportion³ of optional cases has to be taken into account, and ideally, details about the exact distribution of the two kinds of cases should be looked for. Secondly, it was noted that the classification of these samples was not at all an easy task. For this reason, we undertook an annotation study, to try to get a better understanding of the actual distribution and the relevant parameters.

2.2.2. First annotation study

The first annotation study should be described as a pilot study: we asked 11 raters to classify 17 samples taken from the previous corpus. The three classes that we presented earlier were proposed, and we asked participants not only to attribute a category to every sample, but in addition to rate their degree of confidence on a 10 point scale.

The inter-annotator agreement turned out to be very poor: Fleiss (1971) κ equals 0.23. This confirms that the annotation task is (too) hard, and also suggests that the three classes that had been proposed might not be appropriate.

A closer inspection of the annotation data resulted in the following observations:

1. Since the overall agreement is so low, we do not get reliable figures for the distribution of the 17 samples into our 3 classes;
2. however, there are cases where the inter-annotator agreement is reasonably high: it concerns about half of the items, and 6 of them are labelled **optional**, while 3 are labelled **obligatory**.
3. Our category **inferential** is clearly the most problematic one, and this is confirmed by the confidence scores: there is a significant difference between the means for this category and the means for the other two, strongly suggesting that the annotators were not at ease with this category.

2.2.3. Second annotation study

Our second annotation study was more controlled and we introduced a number of changes:

1. Number and diversity of samples was increased by adding 2 novels⁴. We ended up with a list of 47 samples.
2. We removed the intermediate category, keeping only two classes (obligatory/optional).
3. We did not ask the raters a degree of confidence.

The study was run with 15 (new) annotators, but the inter-annotator agreement also turned out to be very low: κ was this time equal to 0:24.

The individual study of the samples shows that a bit less than 50% of the samples were given the same category by more than 65% of the raters, which might suggest that at least some samples were reasonably easy to classify, and that further studies to try to find out the relevant parameters should probably be undertaken; however, it also turns out that the samples that were classified the most clearly in the second study are not the same as in the first study, which again shows that the task is not easy and there is no obvious convergence.

2.3. Discussion

We can only draw weak conclusions from the studies presented here. The first one is that the number of optional cases is far from being negligible. We still cannot decide whether, in literary texts, they represent 30 or 60%, but their massive presence has to be accounted for by any theory dealing with obligatoriness of additives.

The second conclusion we can draw is that it is not established that the inferential category even exist. Interviewing the raters led to the observation that for some of them, inferential cases were very close to obligatory case (implicitly assuming, as we did, that inferences were not wanted), but for many raters, the inferential cases were rather considered as similar to optional cases.

A possible explanation for the difficulty of the task would be that the pressure to use *too* is not categorical in nature, but rather gradable: real obligatoriness and real optionality could be the two extreme points on a rich scale of variable pressure to use *too*. In this case, enforcing a binary choice is expected to lead to inconsistent choices between annotators.

Yet another possible explanation could be that the pressure to use *too* is coming from a variety of parameters at different linguistic levels, the interplay of which having not yet been uncovered. For instance, at first sight, we suspect that information structure, discourse structure, but also distance or lexical choices may all have an influence on the pressure to use *too*. However it seems that focusing on each parameter one at a time is not helping a lot, and rather that more sophisticated methods are needed, in the spirit of what has been done by Joan Bresnan and colleagues about dative alternation (Bresnan et al., 2007).

As an illustration, let us consider briefly the question of lexical identity: among the samples that were rated “obligatory” the most clearly, we find examples where lexical material is repeated or elided. In addition to the sample (13) given above, here are two other examples:

(15)

- Espérons que rien de semblable ne nous arrivera, dit le chasseur; jusqu'ici notre traversée ne me paraît pas dangereuse, et je ne vois pas de raison qui nous empêche d'arriver à notre but.

- Je n'envoie pas non plus, mon cher Dick;

- *Let's hope that nothing similar will happen to us, the hunter said; so far our journey doesn't look dangerous to me, and I don't see any reason which would prevent us to reach our aim.*

- *I don't see [reasons] NON PLUS, my dear Dick;*

(16)

- Mais mon dévouement, comme il vous plaît d'appeler ma culbute, vous a sauvés, est-ce qu'il ne m'a pas sauvé aussi, puisque nous voilà tous les trois en bonne santé?

But if my dedication, as you like to call my somersault, saved us, isn't it the case that it saved me AUSSI, since we are here all three in good health?

Table 2 shows the similarity of the lexical material, and in these three cases, we have the intuition that this closeness is responsible for the high pressure to use *too* in these cases; however a close inspection of the samples reveals that there is at least another case where a strong lexical similarity is observed, while the sample has been most often rated as “optional”: in (17), the same verb is repeated (*pleurer*- to cry), and it is applied to the two characters present in the paragraph, so one would expect a high pressure to use *too*, but our raters did not feel it that way. The reason might be that even though the verb itself is repeated, the syntactic structure of the two “comments” are not parallel enough (a finite tense (imparfait) in the first case, an appositive participial form in the second case).

(17)

C'était Kennedy qui se traînait près de lui; le malheureux faisait pitié, il demandait à genoux, il pleurait.

Joe, pleurant aussi, lui présentait la bouteille, et jusqu'à la dernière goutte, Kennedy en épuisait le contenu.

It was Kennedy who was crawling near him; the poor man was pitiful, begging on his knees, he was crying.

Joe, AUSSI crying, gave him the bottle, and to the last drop, Kennedy exhausted its content.

(15)	Je ne vois pas de raison	je n'en vois pas non plus
(16)	(si) mon dévouement (...) vous a sauvé	est-ce qu'il ne m'a pas sauvé aussi
(13)	si nous étions à bonne portée	il seraient à bonne portée aussi
(17)	il [Kennedy] pleurait	Joe, pleurant aussi

Table 2. TABLE 2: Comparison of the “comments” for some samples

3. Variability of obligatoriness: experimental investigation

We will now turn back to the more restricted contexts in which additives are often thought to be obligatory and put this to a test by means of a controlled experimental study. In fact, Kaplan (1984) already notes in his account of the distributional properties of *too*, that its obligatoriness is variable and depends on at least four parameters. One of those parameters is the degree of anaphoric reduction of the host sentence of *too*. In the following we will consider the case of two clauses coordinated by *and* that differ in one argument (referred to as the contrastive topic) while the remainder of the clause that we shall call comment, is repeated as in (18).

- (18) a. ?Io_{ct} sent Helen a note and Mo_{ct} sent Helen a note
 b.* Io_{ct} sent Helen a note and Mo_{ct} sent her one

Figure 2.

While in the full form *too* does not seem to be fully obligatory (18a), the sentence becomes much less acceptable without *too*, if part of the comment is reduced (18b) by means of pronominalization or ellipsis. Although Kaplan adopts the notion of variability of *too*'s obligatoriness here, his examples are labeled in a traditional system, suggesting that any reduction of the comment leads to ungrammaticality (marked by a star) without *too*, while the full form is more acceptable (marked by a question mark). We conducted an acceptability rating study to investigate whether in French the degree of reduction of the comment predicts the acceptability of the sentence if the French counterpart of *too* (*aussi*) is omitted.

3.1. Method

Twenty-four French test sentences similar to (18) were constructed. The two factors manipulated were Reduction and Aussi. Aussi had two levels (+,-) and Reduction had 6 levels: in full the comment was identical to the antecedent, in pDO the direct object was replaced by a pronoun, in pIO the indirect object was replaced by a pronoun, in pDOIO both complements were replaced by pronouns, in pVP the comment was replaced by the generic VP *l'a fait* ("did it") and in empty the comment was dropped completely. The crossing of Reduction and Aussi resulted in 12 conditions:

(19)

Jean a montré sa voiture à Paul, et Léa... *Jean has shown his car to Paul and Léa... full...*
 a montré sa voiture à Paul aussi

... a montré sa voiture à Paul

... *has shown her car to Paul (too)*

pDO... l'a montré à Paul aussi

... l'a montré à Paul

... *it has shown to Paul (too)*

pIO... lui a montrésavoitureaussi

... lui a montrésavoiture

... *him has shown her car (too)*

pDOIO... lalui a montréaussi

... lalui a montré

... *it hum has shown (too)*

pVP... l'a fait aussi

... l'a fait

... *it has done (too)*

empty... aussi

...

... *(too)*

.

In order to keep the experiment reasonably small, these conditions were tested in two versions: both contained the two baseline levels full and empty. Version A contained additionally pDO and pVP, while version B included pIO and pDOIO. Inside the two versions, the test sentences were distributed to eight lists using a latin square technique (i.e., each list contained each test sentence in only one condition and every list contained an equal number of test sentences in each condition).

The experiment was set up online using Ibx Farm. Participants were presented the test sentence and were to judge on a ten-point scale how acceptable the sentence was. Our sentences were mixed with two other judgment experiments that functioned as fillers. All participants were native speakers of French.

3.2. Predictions

We firstly predict that in all levels of Reduction, the Aussi+version is rated more acceptable because the repeated content licenses the use of *aussi*. Following Kaplan, we also predict for the Aussi-versions a higher acceptability in the full form than in the reduced forms. Generalizing Kaplan's prediction to increasing obligatoriness of *aussi* with increasing degree of reduction of the comment, we finally predict the difference in acceptability between the two Aussi versions to increase with the level of Reduction. For the canonical forms including *aussi*, a beneficial effect of Reduction is expected that penalizes the literal repetition.

3.3. Results

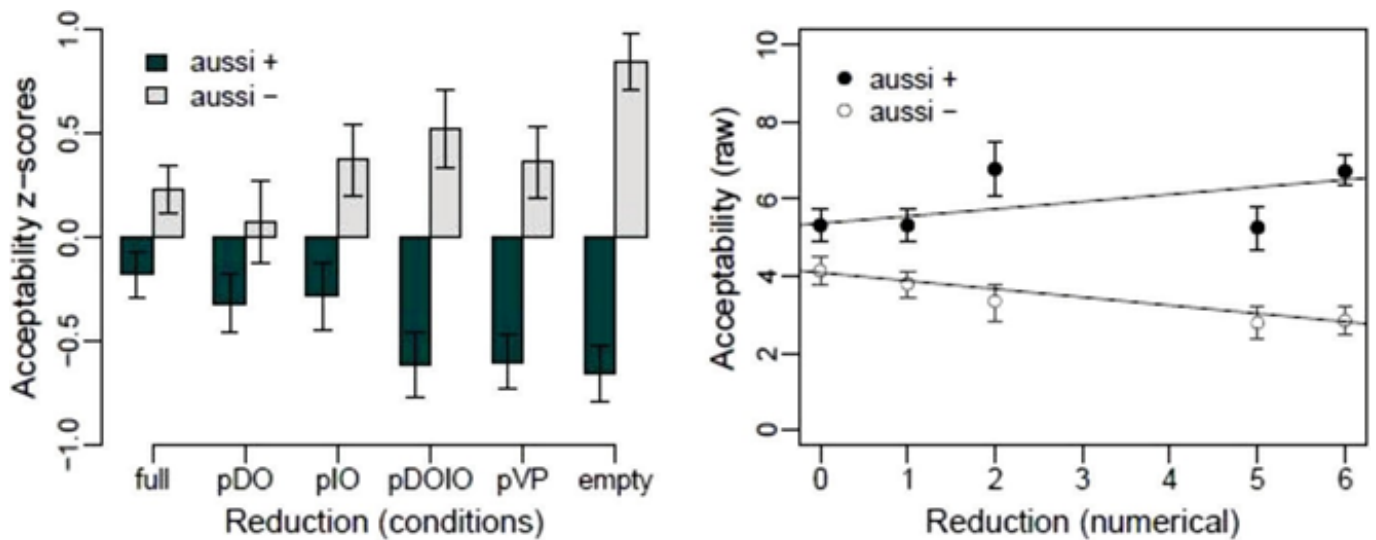


Figure 3. FIGURE 2: Left-hand side: Mean z-transformed acceptability ratings by condition. 0 corresponds to average rating. Right-hand side: Regression lines for *aussi+* and *aussi-* sentences by level of reduction. Circles represent mean acceptability on the 10-point rating scale.

For the descriptive graph in Figure 2, the raw ratings were normalized by participant to account for the fact that people tend to use different portions of the scale. For the inferential analysis, we used generalized linear mixed effect models with random factors for participants and sentences and assessed the contribution of the factors and the interaction through model reduction. The factor Reduction was recoded as a numerical predictor: We scored one point of reduction for each pronominalization and two points for a complete drop, resulting in the following mapping: full= 0, pDO, pIO= 1, pDOIO= 2, pVP= 5, empty= 6.

As apparent in Figure 2, *Aussi+* versions were in general rated higher than their counterparts. This observation is confirmed by a highly significant main effect of *Aussi* in the inferential analysis ($c(1) = 415.08; p < .001$). The factor Reduction showed no main effect ($c(1) < 1$). Importantly, however, there was a significant interaction of *Aussi* and Reduction ($c(1) = 74.31; p < .001$): while in the conditions including *aussi* Reduction led to an increase of acceptability, the versions without *aussi* became less and less acceptable the more the comment was reduced. Especially the last part is nicely observable in Figure 2. The benefit of reduced forms including *aussi*, which was not the main focus of this experiment, seems to be less regular, especially for conditions pIO+ and pVP+.

The results indicate that reduction of the comment indeed leads to a gradual decrease in acceptability, which is not captured by a boolean grammaticality property. The influence of reduction on the pressure to use *aussi* can be explained in two ways: Kaplan attributes this effect to the greater prominence of the contrastive topic in the reduced comment. Additionally, we see a connection to one of the other parameters he recognizes, namely the identity of reference. While the full form *Paul* could refer to a second individual with the same name in the comment, the pronominalized form forces the interpretation that the same person is referred to. This point also connects to the notion of *similarity* employed above: Although on the surface the full forms seem to be the most similar, pronominalization and ellipsis signal similarity in meaning and therefore increase the pressure to use *too*.

Conclusion

The two series of results we presented in this paper confirm that the question of the obligatoriness of *too* should not be treated as a boolean property, but rather as a gradient. The factors that affect this obligatoriness are probably numerous, and we only focused on one specific case where the host and the antecedent of *too* contain similar material.

Having shown that the reduction of the host has a deep impact on the obligatoriness of *too*, we have to explain why this is so. One explanation is to consider, as proposed by Amsili and Beyssade (2010) and Winterstein and Zeevat (2012), that the semantics of *too* goes beyond its sole presupposition and that it also functions as a marker of discourse similarity. One way to model this is to consider that *too* marks that its host and antecedent answer the same question under discussion. In the cases where the similarity is already salient in the discourse, the pressure to use *too* is high because its absence would convey that the elements that appear similar should not be treated as such (it is for such cases that analyses à la “Maximize Presupposition” are relevant).

Therefore to account for the results of the experiment of Sect. 3, we have to explain why this similarity appears higher in the cases of reduction than in the cases where there is a repetition of the lexical material. As already mentioned, when using a pronoun rather than the repetition of a proper name, there is no place for referential ambiguity, and this can be seen as a stricter form of similarity. More generally if some linguistic material *A* is repeated with a form *A'* rather than referred to by anaphoric means, then this leaves more leeway to interpret *A'* as referring to a distinct token of whatever *A* denotes than in the anaphoric case. This means that the use of anaphora, and ellipsis as well, can be seen as a stronger mark of similarity than the lexical repetition of material. This however does not mean that lexical repetition cannot be interpreted as a mark of similarity.

The hypothesis that the use of *too* is linked to a notion of a gradient of similarity is partially confirmed by the experimental results presented in (Winterstein, 2011) where the acceptability of using *too* when relating quantifiers is shown to be linked to the similarity of the quantities denoted: the closer the quantities, the better the use of *too*.

(20)

- a. Paul drank all his beer, and John drank all of his too.
- b. ? Paul drank all his beer, and John drank some of his too.

.

In (20) even though *too* has an antecedent in both versions (by logical entailment in the second case) its use is better in (20a) because the antecedent of *too* is more similar to *too*'s associate in (20a) than in (20b).

In future work we intend to pursue the quest for the various parameters that affect the obligatoriness of *too*. On one hand, we have started a quantitative investigation on corpus, along the lines of Bresnan's approach (Bresnan et al., 2007): we've started to collect a large number of examples and annotate them with all the parameters that we think may play a role (lexical repetition, syntactic parallelism, discourse status, etc.), in the hope that numeric methods (e.g., logistic regression) will help us assess the relative influence of these parameters, so as to be able to predict the degree of obligatoriness of *too*. On the other hand, we plan to pursue our experimental work to further investigate at least some of the other parameters mentioned in (Kaplan, 1984), in the hope that we could shed some light on the linguistic correlates of the notion of similarity that seems central in the distribution of *too*.

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