

Contradicting (not-)at-issueness in exclusives and clefts: An empirical study *

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Abstract We present two empirical studies on exclusives, *it*-clefts, and pseudoclefts (i.e., identity statements with a definite description) in which the at-issue and not-at-issue content—a factor that has not been properly controlled for in prior experimental work on cleft exhaustivity—were teased apart systematically. The results show that violations of exhaustivity in *it*-clefts, a not-at-issue inference, patterned differently from the necessary presupposition failures of the not-at-issue semantic inferences. These findings pose a new experimental challenge to semantic accounts of exhaustivity in *it*-clefts, while being in line with pragmatic accounts.

Keywords: *it*-clefts, not-at-issue content, exhaustivity, necessary presupposition failures

1 Introduction

Focus-background *it*-clefts,¹ as in (1a), along with exclusives and pseudoclefts (i.e., identity statements with a definite description), as in (1b) and (1c), respectively, are all claimed to give rise to an EXHAUSTIVITY INFERENCE, illustrated in (2).

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1 Alternatively referred to as *stressed-focus it-clefts* (Prince 1978), *topic-clause clefts* (Hedberg 1990; Delin & Oberlander 1995), or *contrastive it-clefts* (den Dikken 2013); compare to clefts in which the cleft-pivot is the topic and the cleft-relative contains new information, referred to as *topic-comment clefts*, *informative-presupposition it-clefts* (Prince 1978), *comment-clause clefts* (Hedberg 1990; Delin & Oberlander 1995), or *continuous-topic it-clefts* (den Dikken 2013). See (1–2); new information is underlined (examples from den Dikken 2013).

(1) Q: What got you interested in clefts?

A: It was Brian's book that got me interested in clefts.

(*focus-background it-cleft*)

- (1) a. It is Sabine who went to the zoo.
 b. Only Sabine went to the zoo.
 c. The person who went to the zoo is Sabine.
- (2) → (EXH) *Nobody other than Sabine went to the zoo.*

While exhaustivity in exclusives (e.g., Atlas & Levinson 1981; Beaver & Clark 2008; Velleman, Beaver, Destruel, Bumford, Onea & Coppock 2012) and uniqueness in definite descriptions (e.g., Frege 1892; Strawson 1950) are argued to be semantic in nature, there is an ongoing debate about the SOURCE of exhaustivity in *it*-clefts.² On the one hand there are the semantic accounts, in which exhaustivity is argued to be conventionally coded in the cleft structure (e.g., Atlas & Levinson 1981; Percus 1997; Velleman et al. 2012; Buring & Križ 2013); on the other hand there is the pragmatic account, in which exhaustivity in clefts is claimed to be a conversational implicature (Horn 1981, 2014).

Empirical research, often with exhaustivity in exclusives as a baseline, appears to support a pragmatic approach, since cleft exhaustivity is comparatively weak and more easily cancellable or violable (Destruel 2012; Destruel et al. 2015; Saur 2013; Byram-Washburn, Kaiser & Zubizarreta 2013). The STATUS of exhaustivity, however—that is, whether exhaustivity is at-issue or not-at-issue—may pose a potential confound to empirical research orthogonal to the semantic-pragmatic debate. At issue content, that which directly addresses the Question under Discussion (QUD) (Simons, Beaver, Tonhauser & Roberts 2010; Tonhauser, Beaver, Roberts & Simons 2013), is a critical factor that has not been properly controlled for in prior experimental work (see Section 2.2). Crucially, exhaustivity in clefts is considered to be not-at-issue; by contrast, exhaustivity in exclusives is claimed to be at-issue (see, e.g., Horn 1981; Velleman et al. 2012; Buring & Križ 2013; Horn 2014; Destruel et al. 2015). Perhaps the simplest contrast to illustrate this is found in the examples in (3) (from Buring & Križ 2013: 2; modelled on Horn 1981).

- (3) a. Not-At-Issue Exhaustivity in Clefts → Uninformative
 #She invited Fred, but it wasn't Fred she invited.
- b. At-Issue Exhaustivity in Exclusives → Informative
 ✓She invited Fred, but she didn't invite only Fred.

It has been argued that an inference's status as at-issue or not-at-issue is relevant for many linguistic diagnostics, such as inter-speaker correction (Destruel et al.

- (2) Q: Do you know Brian's book?
 A: It was Brian's book that got me interested in clefts. (topic-comment *it*-cleft)

² Following Destruel, Velleman, Onea, Bumford, Xue & Beaver (2015) we will use the following terminology. SOURCE: semantic or pragmatic. STATUS: at-issue or not-at-issue.

2015), intra-speaker cancellation (Mayol & Castroviejo 2013), NPI licensing, among other things (Horn 2014). Yet Drenhaus, Zimmermann & Vasishth (2011), Destruel (2012), and Destruel et al. (2015) have all modelled their claims about the not-at-issue exhaustivity of clefts compared to the behavior of the at-issue exhaustivity of exclusives. The goal of the present study is to test empirically how the not-at-issue status of an inference influences acceptability judgments in a variation on more standard cancellation tasks, referred to here as *felicity under contradiction*: in our design, a conjunct explicitly negates the relevant at-issue and not-at-issue inferences resulting in a contradiction for semantic inferences. We proceed as follows: In Section 2 we briefly summarize several semantic and pragmatic accounts of cleft exhaustivity, followed by an overview of the role at-issue and not-at-issue content is argued to play in various linguistic diagnostics. We describe the methods and design for our experiments in Section 3, which is further broken down into two subsections: In Section 3.2 we present Experiment I (*it*-clefts vs. exclusives), and in Section 3.3 the follow-up Experiment II (pseudoclefts vs. exclusives). In Section 4 we discuss the results. Section 5 concludes.

2 Background

2.1 Semantic vs. pragmatic accounts of cleft exhaustivity

Semantic accounts In Velleman et al. 2012, **clefts** and **exclusives** are argued to belong to the family of *inquiry terminating constructions* that all serve the same pragmatic function: to indicate that an answer to the current question is maximal. However, they differ in what the at-issue content is: That is, they take exclusives and clefts to encode the same semantics, but while clefts presuppose exhaustivity (the MAX operator in their analysis) and assert the truth of the answer to the current question (the MIN operator), for exclusives these operators are reversed, i.e., MAX is asserted and MIN is presupposed.

Alternatively, there are several proposals in the literature in which **clefts** are argued to be parallel to **definite descriptions** in their underlying syntax and semantics (Percus 1997; Hedberg 2000; Büring & Križ 2013). Similar to Velleman et al. 2012, Büring & Križ (2013) argue that exhaustivity in clefts is presuppositional; unlike Velleman et al. 2012, however, in this analysis cleft exhaustivity is captured indirectly as a homogeneity—not a maximality—presupposition, which they propose for definite descriptions as well. Given homogeneity, clefts and definite descriptions presuppose that the elements in the identity statement are not a proper part of the sum individual which satisfies the backgrounded predicate. For example, in a sentence such as *It was Fred she invited*, it is presupposed that Fred is not one from a plurality of individuals invited; i.e., either Fred is the only person she invited, or she did not

invite Fred at all. The assertion of the cleft, e.g., *She invited Fred*, together with the homogeneity presupposition, gives rise to the exhaustivity inference *She invited Fred and no one else*.

In an earlier proposal, Percus (1997) claims that **clefts** and **pseudoclefts** with a definite description are derived from the same underlying syntactic structure. Specifically, the cleft relative is the result of extraposition of the relative clause from an identity statement with a definite description (e.g., *The one(s) [that Mary saw] is John* → *The one(s) t_i is John [that Mary saw]_i*), while the pronoun *it* is the spell out of the definite, resulting in the *it*-cleft structure (i.e., *It t_i is John [that Mary saw]_i*).³ As Percus (1997: 339) argues, this analysis can account for the characteristics that clefts and definite descriptions share (e.g., semantic interpretation, binding, NPI licensing, etc.), since they “are identical in their properties, and any account that applies to one should apply to the other.” Importantly, exhaustivity in clefts is nothing more than uniqueness in definite descriptions (Percus 1997: 342).

Despite differing in the details, what the above semantic approaches all share is that exhaustivity is coded in the cleft structure itself.

Pragmatic account On the other side of the theoretical debate, Horn (1981, 2014) proposes that exhaustivity in clefts is an example of Gricean pragmatic enrichment. This view is supported by various observations, such as, for instance, that cleft exhaustivity neither behaves as other entailments nor projects, as with typical presuppositions, and, moreover, that in some contexts exhaustivity appears to be defeasible, illustrated by the corpus data in (4).

- (4) a. “... it was the gift that killed him, as much as anything.”
(*Stochastic Man* by Robert Silverberg, cited by Horn 1981 via Ellen Prince)
- b. “Yes, it is bread we fight for—but we fight for roses too!”
(in a poem by James Oppenheim in 1911, cited by Horn 2014)

In Horn 1981, the exhaustivity effect for clefts is captured as a generalized conversational implicature, in which the existence presupposition triggered by the cleft relative is essential for deriving the exhaustivity implicature. Later, Horn (2014) revises this claim and suggests that the exhaustivity effect is due to general pragmatic principles operating on the focal alternatives.

Orthogonal to the semantic-pragmatic debate, however, but relevant for empirical work on cleft exhaustivity, is the role at-issueness is argued to play in various linguistic diagnostics.

³ However, clefts are underspecified for number—indicated by *one(s)* above—which in Percus’s (1997) analysis is represented with a null head in the underlying DP; cf. definite descriptions, which encode singular and plural features (Percus 1997; Buring & Križ 2013).

2.2 (Not-)at-issue content in various linguistic diagnostics

Destruel et al. (2015) argue that the *Yes, but...* test used by Onea & Beaver (2009) for Hungarian pre-verbal focus is only sensitive to an inference's status as at-issue or not-at-issue, and not its source as semantic or pragmatic, contra the conclusions drawn in Onea & Beaver 2009. They conducted a series of experiments comparing various inferences differing in both their source and status (namely, relevance implicatures, scalar implicatures, appositives, and non-restrictive relative clauses), and found that it was the not-at-issue content that elicited a majority of inter-speaker corrections with *Yes, but*, regardless of the inference being semantic or pragmatic.

In two empirical studies, Mayol & Castroviejo (2013) test whether or not at-issueness influences the felicity judgments of cancellation for scalar implicatures. What they find is that cancellation was rated significantly better when the at-issue content in the cancellation differed from the original at-issue inference (Kuppevelt 1996), which is illustrated in the contrast in (5).⁴ In other words, the felicity of the cancellation depended on the QUD answered by the cancellation being different from the original QUD, shown by the change in focus-marking in (5b). (Examples cited from Mayol & Castroviejo 2013: 88.)

- (5) a. (QUD) *How many cars do you have?*
 I have [two]_F cars. #In fact, I have [three]_F.
 b. (QUD) *Who has two cars?*
 [I]_F have two cars. ✓In fact, I have [three]_F.

Moreover, Horn (2014) argues that, among other things, differences in at-issue status account for differences in NPI licensing. As an example, *barely* can license an NPI such as *lift a finger* (meaning 'help'), as in (6a) (despite exhibiting veridicality and not being downward entailing), while the semantically similar *almost* cannot, as in (6b) (examples from Horn 2014).

- (6) a. ✓Dana barely lifted a finger to help.
 b. *Dana almost lifted a finger to help.

Consider the differences in the (not-)at-issue status of the inferences in (7–8), illustrating that NPIs can only be licensed by at-issue negation.

- (7) Dana barely lifted a finger to help.
 a. (*At-Issue*) Dana came close to not lifting a finger to help.

⁴ Example (5a) may be possible with the interpretation that the speaker is correcting herself, referred to as SELF-REPAIR. In their experiments, Mayol & Castroviejo (2013) find that conditions with explicit triggers for self-repair (e.g., "*I mean, ...*" instead of "*In fact, ...*") were generally judged worse than cancellations with QUD change.

- b. (*Not-At-Issue*) Dana helped.
- (8) *Dana almost lifted a finger to help.
- a. (*At-Issue*) Dana came close to helping.
- b. (*Not-At-Issue*) Dana did not lift a finger to help.

In sum, the status of an inference as at-issue or not-at-issue has been shown to play a critical role in various linguistic diagnostics. Thus, although the not-at-issue exhaustivity of clefts has been found to be weaker than the at-issue exhaustivity in exclusives, conclusive results when testing exhaustivity effects will require careful controls for at-issue content.

3 Experiments I & II

3.1 Methods

In order to examine the role (not-)at-issueness plays in diagnostics of exhaustivity, we explore two (non-mutually exclusive) hypotheses here, namely, that exhaustivity in clefts is weaker than exhaustivity in exclusives because:

- Hypothesis 1: the STATUS of exhaustivity in clefts is different than in exclusives (i.e., cleft exhaustivity is not-at-issue).
- Hypothesis 2: the SOURCE of exhaustivity in clefts is different than in exclusives (i.e., cleft exhaustivity is pragmatic).

We conducted two experiments in German for three sentence types: exclusives, as in (9), *it*-clefts, as in (10), and definite descriptions—i.e., pseudoclefts containing an identity statement with a definite description—as in (11), disentangled below in terms of their (a) at-issue and (b) not-at-issue content.

- (9) Nur Sabine hat den Tierpark besucht.
only Sabine has the zoo visited
'*Only Sabine visited the zoo.*' (exclusive)
- a. At-Issue, Semantic → *Nobody other than Sabine visited the zoo.*
- b. Not-At-Issue, Semantic → *Sabine visited the zoo.*
- (10) Es ist Sabine, die den Tierpark besucht hat.
it is Sabine who the zoo visited has
'*It is Sabine who visited the zoo.*' (*it*-cleft)
- a. At-Issue, Semantic → *Sabine visited the zoo.*

- b. Not-At-Issue, Sem./Prag.? → *Nobody other than Sabine visited the zoo.*
- (11) Diejenige, die den Tierpark besucht hat, ist Sabine.
the.one who the zoo visited has is Sabine
'*The one who visited the zoo is Sabine.*' (definite description)
- a. At-Issue, Semantic → *Person who visited the zoo = Sabine.*
- b. Not-At-Issue, Semantic → *Unique person who visited the zoo is Sabine.*
(i.e., *Nobody other than Sabine visited the zoo.*)

The experiments were designed such that the intra-speaker violations of the above at-issue (AI) and not-at-issue (NAI) inferences were manipulated systematically. Target items were constructed by conjoining one of the three sentence types in (9–11) with the negation of the (a) AI and (b) NAI content using the following schemas:

- (12) a. *S and ¬(at-issue inference)* b. *S and ¬(not-at-issue inference)*

With schema (a), we set a baseline for semantic contradiction: An assertion conjoined with the negation of that assertion should invariably be unacceptable. By contrast, schema (b) triggers a NECESSARY PRESUPPOSITION FAILURE for semantic inferences (Heim & Kratzer 1998: §4.4.4): If a proposition *p* triggers the presupposition *q* and then is conjoined with *not(q)*, it will give rise to a presupposition failure given the semantics alone, illustrated by the infelicity of a sentence such as *#My cat is sick and I don't have a cat*. Note that although we refer to schemas (a) and (b) in (12) as at-issue and not-at-issue CONTRADICTIONS, with this terminology we wish to remain neutral as to the source of the not-at-issue inference in the case of clefts. We predict the following:

- Assuming cleft exhaustivity is semantic (e.g., presuppositional following Velleman et al. 2012; Percus 1997; Büring & Križ 2013), if its status as not-at-issue is responsible for the higher acceptability rates when violated, then schema (b) across sentence types will show *similar* patterns.
- Alternatively, assuming cleft exhaustivity is pragmatic (following Horn 1981, 2014), if its source as pragmatic is responsible for the higher acceptability rates when violated, then schema (b) for clefts will show a *different* pattern from schema (b) for exclusives and pseudoclefts with definite descriptions, and the latter two will pattern alike.

Example target items in German and their glosses are presented for Experiment I in Section 3.2 and for Experiment II in Section 3.3; furthermore, see Appendix A for the complete list of lexicalizations in the exclusive condition for both at-issue and not-at-issue contradictions.

3.2 Experiment I: *it*-clefts & exclusives

Design Experiment I employed a 2x2 factorial design, SENTENCE TYPE (two levels: *Exclusive*, *Cleft*) and CONTRADICTION TYPE (two levels: *At-Issue* (AI), *Not-At-Issue* (NAI)), fully crossed, in a pen-and-paper questionnaire. Thus, there were a total of four conditions, and for each condition (*Exclusive AI*, *Cleft AI*, *Exclusive NAI*, *Cleft NAI*) there were 12 lexicalizations, with a sum of 48 target items per questionnaire. There was a 1:1 filler ratio, for 96 sentences total. Filler items were expected to be relatively more acceptable (i.e., SVO and OVS word orders, with non-contradictory subject and object contrasts in the conjunction). The target and filler items were randomized and a Latin square distribution of the targets was done over four questionnaires. No two targets or fillers appeared next to each other, and the order of items was presented both forward and backward for a total of eight questionnaires. Target items (13) and (14) provide a baseline for semantic contradiction, whereas (15) and (16) are the main points of comparison for the NAI inferences.

(13) ***Exclusive, AI Contradiction*** [$exh(p) \wedge \neg(exh)$]

Nur Sabine hat den Tierpark besucht und Anna hat den Tierpark besucht.
only Sabine has the zoo visited and Anna has the zoo visited

TARGET: ‘*Only Sabine visited the zoo and Anna visited the zoo.*’

(14) ***it-Cleft, AI Contradiction*** [$p \wedge \neg(p)$]

Es ist Sabine, die den Tierpark besucht hat, und sie hat den Tierpark nicht
it is Sabine who the zoo visited has and she has the zoo not
besucht.
visited

TARGET: ‘*It is Sabine who visited the zoo and she did not visit the zoo.*’

(15) ***Exclusive, NAI Contradiction*** [$p \wedge \neg(p)$]

Nur Sabine hat den Tierpark besucht und sie hat den Tierpark nicht besucht.
only Sabine has the zoo visited and she has the zoo not visited

TARGET: ‘*Only Sabine visited the zoo and she did not visit the zoo.*’

(16) ***it-Cleft, NAI Contradiction*** [$exh(p) \wedge \neg(exh)$]

Es ist Sabine, die den Tierpark besucht hat, und Anna hat den Tierpark besucht.
it is Sabine who the zoo visited has and Anna has the zoo visited

TARGET: ‘*It is Sabine who visited the zoo and Anna visited the zoo.*’

Participants Thirty-two German native-speakers from Universität Potsdam (twenty-three female, eight male, and one withheld) participated in Experiment I. Compensation was either thirty minutes participation credit as part of the requirements for a Bachelor's degree or 5 Euro. The mean participant age was 22, ranging from 20 to 36. Thirty-one of the participants had completed a high school degree, and one participant had a Master's degree or higher. All grew up in Germany. Seven participants had at least one parent who grew up outside of Germany, and five considered themselves bilingual (from childhood) in German and one other language. All reported speaking at least one foreign language, and most two or more.

Results A linear mixed effects analysis was conducted using *R* (R Core Team 2015) and *lme4* (R package version 1.1-8, Bates, Mächler, Bolker & Walker 2015), with pairwise comparisons of the full models with the effects in question against the models without the effects in question. The exclusive and at-issue conditions served as baselines. There was a highly significant interaction of sentence and contradiction type ($\beta = 1.76563$, $SE = 0.11608$, $t = 15.211$): That is, the effect of contradiction type differed between clefts and exclusives, as seen in the left graph in Figure 1 on page 383, and this effect was highly significant (with a t-value above 2 indicating significance). For the simple effects, judgments for clefts and exclusives did not significantly differ in the at-issue condition ($\beta = -0.09375$, $SE = 0.10931$, $t = -0.858$), visible by the overlapping means in the at-issue condition in the left graph in Figure 1. Contradiction type did significantly affect participants' judgments for clefts—with an increase in the means for clefts from the AI condition to the NAI condition by ca. 1.72 points, seen in the steep slope upwards—but the effect of contradiction type was not significant for exclusives ($\beta = -0.04427$, $SE = 0.08208$, $t = -0.539$), visible in the almost flat line between the AI and NAI conditions in the left graph in Figure 1. See Table 1 on page 385 for a table of means and standard deviations.

Discussion: Experiment I Hypothesis 1, i.e., that cleft exhaustivity is weaker because it is not-at-issue, is not supported. Whereas there was no improvement in acceptability for exclusives between the AI and NAI conditions, there was a highly significant improvement for clefts in the NAI condition. Hypothesis 2, i.e., that cleft exhaustivity is weaker because it is pragmatic, is compatible with the results here.

In a couple of recent studies, however, there is compelling data suggesting that not-at-issue content constitutes a non-homogeneous class (Cummins, Amaral & Katsos 2013; Tonhauser, Beaver, Degen, de Marneffe, Roberts & Simons 2015) and, crucially, that the prejacent of exclusives behaves differently from other not-at-issue inferences. For instance, Cummins et al. (2013) conducted an experiment testing various presupposition triggers in question-answer pairs. Their experimental

manipulations included inter-speaker acceptance/rejection of at-issue and not-at-issue content. Cummins et al. (2013) are cautious about making too strong a claim regarding the variation found in their results; however, one notices that the *Yes, although* responses for exclusives—i.e., affirming the assertion with *Yes* while denying the prejacent in the *although*-clause⁵—had the lowest mean rating on a 5-point Likert scale and the lowest standard deviation of all of the presupposition triggers tested.⁶

Furthermore, in a series of recent experiments testing degrees of projectivity and not-at-issueness, Tonhauser et al. (2015) find significant variation for numerous triggers of projective content. Important here, the results for the prejacent of *only* differed significantly in being overall less projective and less not-at-issue not only in comparison to projective content from triggers in a different category (*Class B* in Tonhauser et al.’s (2013) four-way taxonomy) but also from triggers within its own category (namely, *Class C*; see Tonhauser et al. 2013). Thus, in order to check whether the results in Experiment I were due to the prejacent of exclusives behaving unusually with respect to other not-at-issue inferences, we ran a follow-up experiment in order to compare the presupposition failure of exclusives to its counterpart in definite descriptions.

3.3 Experiment II: Pseudoclefts & exclusives

Design Experiment II compared exclusives to pseudoclefts with definite descriptions in the same experimental design. If the results from Experiment I are due to the prejacent of exclusives being different from other not-at-issue inferences, then the presupposition failure for exclusives is predicted to behave differently from the presupposition failure for definite descriptions in this follow-up experiment.

Target and filler items and their distribution were identical to Experiment I, except *it*-clefts were replaced with their corresponding pseudoclefts containing an identity statement with a definite description, illustrated below.

(17) (*exclusives were identical to Experiment I in both the AI and NAI conditions*)

(18) **Definite Description, AI Contradiction** [$p \wedge \neg(p)$]

Diejenige, die den Tierpark besucht hat, ist Sabine und sie hat den Tierpark
 the.one who the zoo visited has is Sabine and she has the zoo

⁵ This is the inter-speaker version of the intra-speaker contradiction illustrated in (15).

⁶ Specifically, in their experiment the mean naturalness rating for exclusives in the *yes, although* condition was 1.30 (SD = 0.92) on a five-point scale, 1 being “completely unnatural” and 5 being “completely natural.” 2.06 was the overall mean naturalness rating for the triggers tested in this condition, with 2.95 being the highest mean rating (*too*); see Table 2 in Cummins et al. 2013: 210 for an overview. Other triggers tested include comparatives as well as the lexical triggers *too, again, continue, still, stop, and regret*, roughly in order here for mean judgments of more to less natural.

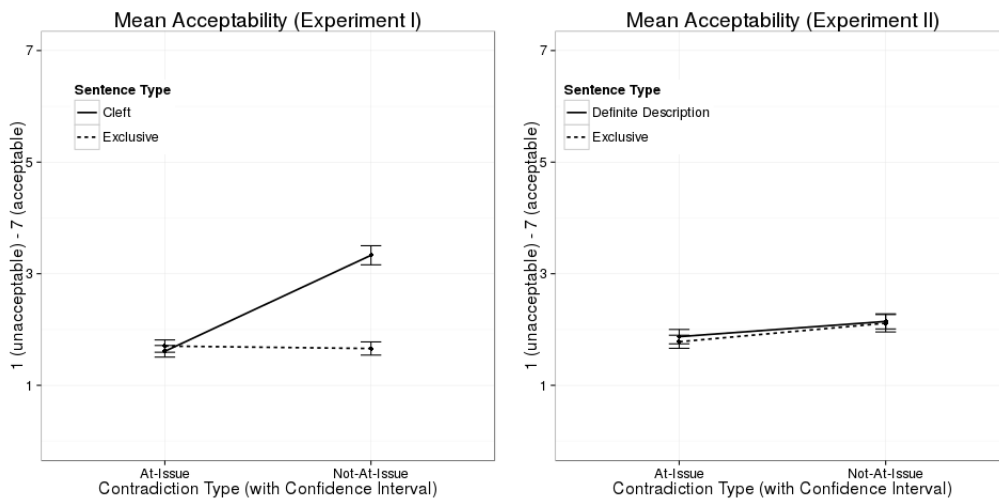


Figure 1 Experiment I is shown on the left; Experiment II is shown on the right. The interaction of sentence and contradiction type was highly significant in Experiment I, but did not reach significance in Experiment II.

nicht besucht.
not visited

TARGET: ‘*The one who visited the zoo is Sabine and she didn’t visit the zoo.*’

(19) **Definite Description, NAI Contradiction** [$p \wedge \neg(exh)$]

Diejenige, die den Tierpark besucht hat, ist Sabine und Anna hat den Tierpark
the.one who the zoo visited has is Sabine and Anna has the zoo
besucht.
visited

TARGET: ‘*The one who visited the zoo is Sabine and Anna visited the zoo.*’

Note that the definite description target items were constructed using the compounds *derjenige* / *diejenige* / *dasjenige*, which are composed of the definite articles *der* / *die* / *das* ‘the.MASC / the.FEM / the.NEUT’ plus *-jenige*. Etymologically, *-jenige* developed from *jene* / *jener*, which means “that one (over there)”; note that *jene* may appear on its own, but *-jenige* cannot. Additionally, the compounds *derjenige* / *diejenige* / *dasjenige* take the appropriate case endings (for instance, *demjenigen* / *derjenigen* / *demjenigen* for the dative case, and so on for the accusative and genitive cases). Since they are always functioning as the grammatical subjects here, the compound definites display the nominative case.

Participants Thirty-two German native-speakers from both Universität Potsdam and Humboldt Universität (twenty-one female and eleven male) participated in Experiment II. Compensation was 3 Euro. The mean participant age was 26, ranging from 18 to 40. Twelve of the participants had completed a high school degree, twelve participants had completed a Bachelor’s degree, one a vocational degree, and seven had a Master’s degree or higher. All grew up in Germany. Three participants had at least one parent who grew up outside of Germany. Two participants considered themselves bilingual (from childhood) in German and one other language, and one was trilingual in German and two other languages. All reported speaking at least one foreign language, and most two or more.

Results A linear mixed effects analysis was conducted using *R* and *lme4*, with pairwise comparisons of the full models with the effects in question against the models without the effects in question. Just as in Experiment I, the exclusive and at-issue conditions served as baselines. Unlike in Experiment I, there was no significant interaction of sentence and contradiction type ($\beta = -0.04025$, $SE = 0.09978$, $t = -0.403$), indicating there was no statistical difference of the effect of contradiction type between the two sentence types, visible in the parallel slopes in the right graph in Figure 1 on page 383. For the simple effects, judgments for exclusives and definite descriptions did not significantly differ in the at-issue condition ($\beta = 0.08683$, $SE = 0.08408$, $t = 1.033$), visible by the overlapping means in the right graph in Figure 1. However, the effect of contradiction type did reach significance for exclusives ($\beta = 0.32688$, $SE = 0.07050$, $t = 4.637$), and this effect was not significantly different between the exclusive and definite description conditions. A summary of means and standard deviations for both experiments is found in Table 1.⁷

Discussion: Experiment II The results in Experiment II did not fully replicate the results for exclusives from Experiment I: in Experiment I exclusives were judged equally unacceptable across the AI and NAI conditions (visible in the flat line), while in Experiment II there was a very slight but statistically significant increase in acceptability in the NAI condition (visible in the gradual upward slant)—notably, the same effect was found for definite descriptions. In other words, the contradiction of at-issue content was judged as slightly worse than the presupposition failure for exclusives and definite descriptions; crucially, however, exclusives and definite descriptions patterned similarly in this regard.⁸

⁷ Note that two participants overlooked one entire page (with 8 sentences per page) when completing the questionnaires for Experiment II, resulting in some missing data points for the targets and filler.

⁸ It may be that acceptability judgments for exclusives were not replicated given differences in the proportions of acceptable to unacceptable sentences having a local effect within the experiment. That

Experiment I				Experiment II			
<i>sent.</i>	<i>contr.</i>	<i>n</i>	<i>mean (sd)</i>	<i>sent.</i>	<i>contr.</i>	<i>n</i>	<i>mean(sd)</i>
Excl.	AI	384	1.703 (1.103)	Excl.	AI	382	1.780 (1.172)
Excl.	NAI	384	1.659 (1.181)	Excl.	NAI	383	2.112 (1.559)
Cleft	AI	384	1.609 (1.036)	DefDes	AI	383	1.872 (1.289)
Cleft	NAI	384	3.331 (1.711)	DefDes	NAI	380	2.145 (1.346)

Table 1 A summary of means and standard deviations for both experiments.

4 General discussion

In light of the results reported here, the hypothesis that cleft exhaustivity is weaker than in exclusives because it is not-at-issue is not supported. In Experiment I the not-at-issue exhaustivity inference of clefts patterned differently from the not-at-issue prejacent in exclusives—with the cleft exhaustivity violation being judged more acceptable than the presupposition failure of the exclusive—and this difference was highly significant. Moreover, in Experiment II we found that the results in the first experiment cannot simply be attributed to the prejacent of exclusives behaving unusually compared to other not-at-issue semantic inferences: Judgments of the presupposition failure for exclusives patterned on a par with the uniqueness presupposition failure for definite descriptions.

Hypothesis 2, namely, that cleft exhaustivity is weaker than in exclusives because it is pragmatic, is compatible with the results here (following Horn 1981, 2014). We will flesh out a pragmatic proposal shortly, but first we would like to discuss what the above results mean for the semantic theories of cleft exhaustivity discussed in Section 2.1.

A challenge for semantic theories The results here pose a challenge for semantic theories of cleft exhaustivity. Velleman et al.’s (2012) proposal—in which clefts and exclusives have the same underlying semantics but vary only in what is at-issue and what is not-at-issue—is not compatible with these results, at least not without some modification to account for the seemingly aberrant behavior of clefts. If their theory is correct, the exhaustivity inference which arises from a sentence with the form *It is x that P and y P* should be judged as unacceptable as other contradictions of semantic content.

is, Experiment I had more intermediately acceptable sentences in the Cleft NAI condition, whereas Experiment II had more unacceptable sentences in the Definite Description NAI condition. These differences may influence the relative judgments of sentences when compared to the other sentences presented in the questionnaires.

One might claim that exhaustivity in clefts fundamentally differs from the pre-jacent of exclusives, in that cleft exhaustivity involves quantification (i.e., over some contextually-provided domain) whereas the pre-jacent does not, and this may account for the difference in judgments found in Experiment I. For [Velleman et al. 2012](#) this argument is a non-starter, however: in their analysis, both the MIN and the MAX operators involve quantification (an existential quantifier and a universal quantifier quantifying over true answers, respectively). Additionally, an explanation based on quantification in order to account for the *deviant* results for clefts in Experiment I would have trouble accounting for the *parallel* results for definite descriptions in Experiment II, since in most standard accounts of definite descriptions the uniqueness presupposition also involves existential quantification.

The proposals of [Percus 1997](#) and [Büring & Križ 2013](#) similarly run into trouble in light of these results. With [Percus's \(1997: 339\)](#) analysis, it is difficult to account for why clefts in Experiment I and definite descriptions in Experiment II would behave so differently when compared to exclusives, since clefts and definite descriptions are “structurally indistinguishable.”⁹ Whereas [Büring & Križ's \(2013\)](#) analysis does not rely on clefts having the same semantics as definite descriptions, their account of cleft exhaustivity as a homogeneity presupposition would have similar problems as [Velleman et al.'s \(2012\)](#) presuppositional analysis. In the diagnostic used here, when cleft exhaustivity is violated one would predict that the resulting presupposition failure should render the sentence just as unacceptable as other necessary presupposition failures, again contrary to fact.

Toward a solution The proposal in [Horn 1981](#), in which cleft exhaustivity is a generalized conversational implicature, provides one potential pragmatic analysis. Moreover, the discussion in [Horn 2014](#), in which the exhaustivity effect is suggested to be due to general pragmatic principles operating on the focal alternatives, may also offer a way to account for cleft exhaustivity, but the details remain unclear. Here we wish to spell out an analysis in which exhaustivity in clefts is a focus-triggered scalar implicature.

Focus-background *it*-clefts—with the bipartite structure consisting of a focused cleft pivot and a backgrounded existential presupposition cleft relative—have been claimed to be licensed by discourse-semantic factors, for instance, by discourse-structural ([Delin 1992](#); [Delin & Oberlander 1995](#)) or metalinguistic discourse factors ([Destruel & Velleman 2014](#)); cf. common-ground management in [Krifka 2008](#). By backgrounding the relative clause, focus-background *it*-clefts are a structural device which mark a focus unambiguously, assuming that focus projection out of the cleft

⁹ Again, modulo number specification for definite descriptions; see footnote 3 on page 376.

pivot is not possible.¹⁰ The alternatives and the QUD are thus clearly designated, which provides optimal conditions for information-enriching implicatures: The focal alternatives build scales, and the quantity maxim conversationally implicates the exclusion of alternatives higher on the scale. Such a proposal could account for the data here. In this approach, exhaustivity is not coded in the cleft structure but is derived from standard pragmatic principles; and thus, as with other examples of Gricean pragmatic enrichment, the exhaustivity inference is defeasible, as has been observed in the literature (again, see the sentences in (4) for corpus examples from Horn 1981, 2014).

Nevertheless, one still has to account for the difficulty in cancelling the exhaustivity implicature in clefts, as suggested in the results here (given the mid-to-low acceptability ratings) and also observed in both the theoretical and empirical literature, in particular in comparisons of cleft exhaustivity and exhaustivity effects for canonical focus. There are two ways to address this: First, we would like to propose that it is not necessarily clefts that have strong exhaustivity effects, but canonical focus that has weak exhaustivity effects. Clefts provide an ideal environment for information-enrichment. For canonical focus, however, this is not the case: The possibility of focus projection structurally allows for an ambiguous domain of alternatives (not only for objects; see Büring 2006, who claims that focus projection is possible from canonical subjects as well), resulting in a suboptimal environment for pragmatic enrichment. Second, in these experiments clefts appeared out of the blue and thus the discourse factors which license clefts were absent, which could account for the low acceptability judgments unrelated to exhaustivity *per se*.

If this approach is going down the right path, there are several predictions we would like to test in future research. First, we expect a strong difference in exhaustivity between object *it*-clefts, which do not allow for focus projection, and canonical object foci, which do. Similarly, since focus accent on subjects may not mark focus unambiguously in canonical sentences either, we expect canonical sentences with focused subjects to be not as exhaustive as subject *it*-clefts. Finally, in contexts in which other pragmatic reasons for focus are available, we predict that

¹⁰ There are examples of subconstituent focus-marking in the cleft pivot, in which the pivot contains a complex noun phrase and only a subconstituent is the focus, as discussed by Velleman et al. 2012.

- (1) a. It was John's [eldest]_F daughter who liked the movie.
 → None of John's other daughters liked the movie.
 b. It was [John's]_F eldest daughter who liked the movie.
 → Nobody else's eldest daughter liked the movie.

In these examples, pitch accent would disambiguate the focus in spoken speech, whereas without any additional linguistic markers the sentences remain ambiguous. Nevertheless, projection out of the cleft pivot appears not to be possible.

exhaustivity implicatures can be replaced by other implicatures, such as mirativity or unexpectedness (see Skopeteas & Fanselow 2011; Destruel & Velleman 2014).

5 Conclusion

We presented two experiments employing a felicity judgment task in which we compared (not-)at-issue inferences with other (not-)at-issue inferences. In particular, we compared the necessary presupposition failures of exclusives to violations of exhaustivity in *it*-clefts in Experiment I; and in Experiment II—as a follow-up to check that the preajcent of exclusives is not unusual compared to other not-at-issue semantic inferences in our diagnostic—we compared the necessary presupposition failures of exclusives to its counterpart in pseudoclefts with a definite description. What we found is that violations of cleft exhaustivity patterned differently from contradictions of semantic content, which poses a new experimental challenge to semantic accounts of exhaustivity in clefts, while being in line with pragmatic accounts. We propose a pragmatic analysis of cleft exhaustivity in which exhaustivity is a focus-triggered scalar implicature.

A German stimuli

Items adapted from Saur's (2013) Master's thesis. The corresponding items for *it*-clefts and definite descriptions will not be presented here, although reconstructing them should be unproblematic; see Sections 3.2–3.3 for examples.

01A: Nur Bruno hat den Zoobesucher bespuckt und der Jugendliche hat den Zoobesucher bespuckt.

01B: Nur Bruno hat den Zoobesucher bespuckt und er hat den Zoobesucher nicht bespuckt.

02A: Nur Norbert hat den Vater gerufen und Peter hat den Vater gerufen.

02B: Nur Norbert hat den Vater gerufen und er hat den Vater nicht gerufen.

03A: Nur Phillip hat die Katze gefüttert und Lars hat die Katze gefüttert.

03B: Nur Phillip hat die Katze gefüttert und er hat die Katze nicht gefüttert.

04A: Nur Hoppel hat das Kabel angeknabbert und Moppel hat das Kabel angeknabbert.

04B: Nur Hoppel hat das Kabel angeknabbert und er hat das Kabel nicht angeknabbert.

05A: Nur Klaus hat zu dem Überfall recherchiert und Hendrik hat zu dem Überfall recherchiert.

05B: Nur Klaus hat zu dem Überfall recherchiert und er hat nicht zu dem Überfall recherchiert.

06A: Nur Fred hat den Hund geneckt und John hat den Hund geneckt.

06B: Nur Fred hat den Hund geneckt und er hat den Hund nicht geneckt.

07A: Nur Lukas hat den Onkel gebissen und Peter hat den Onkel gebissen.

07B: Nur Lukas hat den Onkel gebissen und er hat den Onkel nicht gebissen.

08A: Nur Oliver hat die Königin begleitet und der König hat die Königin begleitet.

08B: Nur Oliver hat die Königin begleitet und er hat die Königin nicht begleitet.

09A: Nur Andreas hat das Bier getrunken und Markus hat das Bier getrunken.

Contradicting (not-)at-issueness

- 09B: Nur Andreas hat das Bier getrunken und er hat das Bier nicht getrunken.
- 10A: Nur das Wildschwein, das den Zaun zertrampelt und der Förster hat den Zaun zertrampelt.
- 10B: Nur das Wildschwein, das den Zaun zertrampelt und es hat den Zaun nicht zertrampelt.
- 11A: Nur Simon hat den Knaben beobachtet und der Butler hat den Knaben beobachtet.
- 11B: Nur Simon hat den Knaben beobachtet und er hat den Knaben nicht beobachtet.
- 12A: Nur Ludwig hat die Steine geworfen und Joschka hat die Steine geworfen.
- 12B: Nur Ludwig hat die Steine geworfen und er hat die Steine nicht geworfen.
- 13A: Nur Louis hat den Libero kritisiert und Leander hat den Libero kritisiert.
- 13B: Nur Louis hat den Libero kritisiert und er hat den Libero nicht kritisiert.
- 14A: Nur Kasper hat die Kinder erfreut und der Räuber hat die Kinder erfreut.
- 14B: Nur Kasper hat die Kinder erfreut und er hat die Kinder nicht erfreut.
- 15A: Nur Timo hat die Kühe gemolken und Oskar hat die Kühe gemolken.
- 15B: Nur Timo hat die Kühe gemolken und er hat die Kühe nicht gemolken.
- 16A: Nur Günther hat den Kandidaten verwirrt und der Telefonjoker hat den Kandidaten verwirrt.
- 16B: Nur Günther hat den Kandidaten verwirrt und er hat den Kandidaten nicht verwirrt.
- 17A: Nur Laura hat das Fenster zerbrochen und Angela hat das Fenster zerbrochen.
- 17B: Nur Laura hat das Fenster zerbrochen und sie hat das Fenster nicht zerbrochen.
- 18A: Nur Lothar hat das Tor getroffen und Stefan hat das Tor getroffen.
- 18B: Nur Lothar hat das Tor getroffen und er hat das Tor nicht getroffen.
- 19A: Nur Franziska hat das Publikum begrüßt und Stefanie hat das Publikum begrüßt.
- 19B: Nur Franziska hat das Publikum begrüßt und sie hat das Publikum nicht begrüßt.
- 20A: Nur Melissa hat den Hustensaft empfohlen und Kerstin hat den Hustensaft empfohlen.
- 20B: Nur Melissa hat den Hustensaft empfohlen und sie hat den Hustensaft nicht empfohlen.
- 21A: Nur Michaela hat den Specht gesehen und Pia hat den Specht gesehen.
- 21B: Nur Michaela hat den Specht gesehen und sie hat den Specht nicht gesehen.
- 22A: Nur Gustav hat die Gurken gekauft und Ede hat die Gurken gekauft.
- 22B: Nur Gustav hat die Gurken gekauft und er hat die Gurken nicht gekauft.
- 23A: Nur Sabrina hat das Baumhaus gebaut und Nadia hat das Baumhaus gebaut.
- 23B: Nur Sabrina hat das Baumhaus gebaut und sie hat das Baumhaus nicht gebaut.
- 24A: Nur Barbara hat den Mathetest verpasst und Hanna hat den Mathetest verpasst.
- 24B: Nur Barbara hat den Mathetest verpasst und sie hat den Mathetest nicht verpasst.
- 25A: Nur Linda hat die Gäste empfangen und Lucy hat die Gäste empfangen.
- 25B: Nur Linda hat die Gäste empfangen und sie hat die Gäste nicht empfangen.
- 26A: Nur Theresia hat die Kursteilnehmer gestört und Susanne hat die Kursteilnehmer gestört.
- 26B: Nur Theresia hat die Kursteilnehmer gestört und sie hat die Kursteilnehmer nicht gestört.
- 27A: Nur Melanie hat die Sängerin überzeugt und Tatjana hat die Sängerin überzeugt.
- 27B: Nur Melanie hat die Sängerin überzeugt und sie hat die Sängerin nicht überzeugt.
- 28A: Nur Polina hat das Publikum begeistert und Emma hat das Publikum begeistert.
- 28B: Nur Polina hat das Publikum begeistert und sie hat das Publikum nicht begeistert.
- 29A: Nur Mandy hat den Kuchen gebacken und Agnes hat den Kuchen gebacken.

- 29B: Nur Mandy hat den Kuchen gebacken und sie hat den Kuchen nicht gebacken.
- 30A: Nur Isabella hat sich um die Stute gekümmert und Sarah hat sich um die Stute gekümmert.
- 30B: Nur Isabella hat sich um die Stute gekümmert und sie hat sich nicht um die Stute gekümmert.
- 31A: Nur Katja hat den Lippenstift benutzt und Ulla hat den Lippenstift benutzt.
- 31B: Nur Katja hat den Lippenstift benutzt und sie hat den Lippenstift nicht benutzt.
- 32A: Nur Petra hat die Mitbewohnerin aufgeweckt und Imke hat die Mitbewohnerin aufgeweckt.
- 32B: Nur Petra hat die Mitbewohnerin aufgeweckt und sie hat die Mitbewohnerin nicht aufgeweckt.
- 33A: Nur Steffen hat den Verkäufer beleidigt und Jochen hat den Verkäufer beleidigt.
- 33B: Nur Steffen hat den Verkäufer beleidigt und er hat den Verkäufer nicht beleidigt.
- 34A: Nur Gustav hat den Marathon bewältigt und Edwin hat den Marathon bewältigt.
- 34B: Nur Gustav hat den Marathon bewältigt und er hat den Marathon nicht bewältigt.
- 35A: Nur Robert hat den Schüler getadelt und Thomas hat den Schüler getadelt.
- 35B: Nur Robert hat den Schüler getadelt und er hat den Schüler nicht getadelt.
- 36A: Nur Aaron hat den Halbstarken aufgehalten und Daniel hat den Halbstarken aufgehalten.
- 36B: Nur Aaron hat den Halbstarken aufgehalten und er hat den Halbstarken nicht aufgehalten.
- 37A: Nur Holger hat die Menschen verzaubert und Bertram hat die Menschen verzaubert.
- 37B: Nur Holger hat die Menschen verzaubert und er hat die Menschen nicht verzaubert.
- 38A: Nur Björn hat das Auto gerammt und Steve hat das Auto gerammt.
- 38B: Nur Björn hat das Auto gerammt und er hat das Auto nicht gerammt.
- 39A: Nur Sören hat den Abgeordneten gewählt und Paul hat den Abgeordneten gewählt.
- 39B: Nur Sören hat den Abgeordneten gewählt und er hat den Abgeordneten nicht gewählt.
- 40A: Nur Moritz hat den Teddybären gewonnen und Malte hat den Teddybären gewonnen.
- 40B: Nur Moritz hat den Teddybären gewonnen und er hat den Teddybären nicht gewonnen.
- 41A: Nur Judith hat den Enkel angemeckert und Lisa hat den Enkel angemeckert.
- 41B: Nur Judith hat den Enkel angemeckert und sie hat den Enkel nicht angemeckert.
- 42A: Nur Maria hat das Märchen übersetzt und Katrin hat das Märchen übersetzt.
- 42B: Nur Maria hat das Märchen übersetzt und sie hat das Märchen nicht übersetzt.
- 43A: Nur Karla hat den Neffen erschreckt und Wiebke hat den Neffen erschreckt.
- 43B: Nur Karla hat den Neffen erschreckt und sie hat den Neffen nicht erschreckt.
- 44A: Nur Gisela hat das Team beurteilt und Per hat das Team beurteilt.
- 44B: Nur Gisela hat das Team beurteilt und sie hat das Team nicht beurteilt.
- 45A: Nur Claudia hat den Wein bestellt und Sandra hat den Wein bestellt.
- 45B: Nur Claudia hat den Wein bestellt und sie hat den Wein nicht bestellt.
- 46A: Nur Sophie hat den Tanz eröffnet und Bea hat den Tanz eröffnet.
- 46B: Nur Sophie hat den Tanz eröffnet und sie hat den Tanz nicht eröffnet.
- 47A: Nur Sabine hat den Tierpark besucht und Anna hat den Tierpark besucht.
- 47B: Nur Sabine hat den Tierpark besucht und sie hat den Tierpark nicht besucht.
- 48A: Nur Tabea hat den Mietvertrag unterschrieben und Nele hat den Mietvertrag unterschrieben.
- 48B: Nur Tabea hat den Mietvertrag unterschrieben und sie hat den Mietvertrag nicht unterschrieben.

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