Referentiality, Exhaustivity, and Trivalence in *it*-Clefts*

Manuel Križ
Institut Jean-Nicod, École Normale Supérieure (ENS, EHESS, CNRS), PSL Research University

Abstract This paper defends the view that semantically, English *it*-clefts are identity statements between two individuals and thus correspond to copular sentences where the cleft clause is turned into a definite description. The consequence of a violation of exhaustivity, which renders neither the cleft nor its negation true, can then be traced to the independently established pattern of trivalence of plural predication. We present an implementation of this idea that is an update of Büring & Križ's (2013) theory. We then discuss numerous aspects of the behaviour of clefts, including the effects of focus, with respect to how our approach can account for them, tracing, in particular, the predicted parallels between clefts and definite descriptions, and in the course of this uncover arguments against alternative approaches to the semantics of clefts.

Keywords Cleft Sentences, Exhaustivity, Homogeneity, Pluralities, Definite Descriptions, Focus Sensitivity

1 Introduction

A lively debate has been going on in recent years on the subject of the so-called *exhaustivity* of cleft-sentences, that is, the fact that (1) generally implies that Nina didn't invite anybody other than Adam.

(1) It was Adam that Nina invited.
⇝ Nina invited nobody else.

The falsity of this inference does not simply render the cleft sentence false and its negation correspondingly true: Neither (1) nor (2) are felicitous in a situation where Nina invited both Adam and somebody else. [1] Rather, it would

* I am particularly indebted to Edgar Onea and Malte Zimmermann, without whose invitation to the Questions in Discourse Network Meetings in September 2014 and June 2015 in Göttingen this paper would not have come to be. I also thank Amir Anvari, David Beaver, Daniel Büring, Andy Lücking, Cécile Meier, Lyn Tieu, and Ede Zimmermann for valuable comments and discussion. All remaining errors (no existence presupposition intended) are, of course, my own. The research leading to these results has received funding from the following sources: European Research Council under the European Union's Seventh Framework Programme (FP/2007-2013) / ERC Grant Agreement n.313610; ANR-14-CE30-0010 TriLogMean; ANR-10-IDEX-0001-02 PSL*; and ANR-10-LABX-0087 IEC.

1 It may be argued that (ia) is sometimes acceptable, so that it seems that the negated cleft is true just on account of the exhaustivity violation. As Büring & Križ (2013) point out, however, in this case, (ib) is acceptable as well, which suggests that we are dealing with metalinguistic negation or perhaps some sort of local silent *only*. This therefore does not constitute a genuine counterexample to the generalisation that a negated cleft is not made true by a violation of exhaustivity.

seem that in such a situation, (1) has some sort of third status, being neither straightforwardly true nor quite plainly false.

(2) It wasn't Adam that Nina invited.

There are currently two basic types of approaches to the analysis of the meaning of clefts. The first, which we will call the *alternative-based approach*, is to apply to clefts what is the standard way of thinking about exhaustivity in other domains: The core assertive meaning of the cleft is taken to be identical to that of the corresponding non-cleft sentence, which is made exhaustive by augmenting it with the negations of alternatives.[2] The precise mechanism by which these negated alternatives are added to the core assertive meaning, and the status which they are assigned, differs between particular implementations of the approach, candidates being mainly conversational implicatures and some kinds of presupposition. Thus, (1) ends up with the overall meaning in (3).

(3) Nina invited Adam. (assertion)
She didn't invite Miles, she didn't invite Agatha, ...
(implicature, presupposition, ?)

The second line of thinking, which we call the *referential approach*, views a cleft as specifying the identity of an individual. To see how this works, assume that this individual is obtained by turning the relative clause of the cleft into a definite description, such that the logical form of (1) is essentially that of (4).[3] The resulting statement is exhaustive to the extent that the denotation of the definite description is maximal, which is usually the case.

(4) The one(s) Nina invited was/were Adam.

Büring & Križ's (2013) recent version of this approach exploits this parallel with definite descriptions to argue that a violation of exhaustivity in a cleft sentence is conceptually the same as a so-called *homogeneity violation* in a sentence with a plural definite description. The latter phenomenon is prototypically exemplified when a distributive predicate holds of some, but not all individuals of the plurality that it is ascribed to, such as in (5a), rendering the sentence not true, but also not simply false.[4]

(5) a. Situation: *Mr. Benfleet published some, but not all of the books.*
#Mr. Benfleet published the books.

(i) a. It wasn't Adam tha Nina invited, it was Adam and Miles.
b. Nina didn't invite Adam, she invited Adam and Miles.

2 Horn 1981, 2014, É. Kiss 1998, Dufter 2009, Velleman et al. 2012, Hedberg 2013, DeVeaugh-Geiss et al. 2015.

3 The parallel with definite descriptions is drawn in Akmajian 1970; Harries-Delisle 1978; Declerck 1988; Percus 1997; Hedberg 2000; Büring & Križ 2013, while Pollard & Yasavul (in press) defend a referential view that does not explicitly rest on this point. Büring & Križ (2013) are, to our knowledge, the only referential theorists to have been concerned with the meaning of negated clefts.

4 Schwarzschild 1994; Löbner 2000; Gajewski 2005; Breheny 2005; Magri 2014; Križ 2016.

b. Situation: *Nina invited both Adam and Miles.*
#It was Adam that Nina invited.

The main objective of the present paper is to argue for the referential approach over alternative-based theories for *it*-clefts. We start out by briefly introducing the most important versions of the alternative-based approach in section 2, before giving our own implementation of the referential approach in section 3, which builds on Büring & Križ's (2013) idea about the role of homogeneity, but improves on their implementation. Section 4 provides an explicit comparison of our version of the approach with theirs. The rest of the paper is then devoted to the discussion of various further aspects of the semantics and pragmatics of clefts with respect to whether they support one theoretical approach or the other, an important part of which is to trace the parallels between clefts and copular sentences with definite descriptions. In the course of this, we aggregate both arguments and observations already present in the literature and new contributions of our own. Anaphoric uses, the presence of an existence presupposition, and the role of focus are examined in section 5. We follow up with a discussion of some puzzling cases of modified clefts with *among others* and focus-sensitive particles in section 6. In section 7, we eventually review a number of recent experimental studies of cleft sentences.

2 Negating Alternatives

The alternative-based approach to cleft sentences posits that the basic assertive meaning of a cleft sentence is just that of the corresponding canonical (i. e. non-cleft) sentence; in the case of (6a), this would be (6b).

(6) a. It was Adam that Nina invited.
b. Nina invited Adam. (assertion)

We then look at the literal meanings of the focus alternatives of the sentence, that is to say, all the propositions expressed by sentences of the form (7a). Some of these are logically stronger than the original sentence, such as the examples in (7b).

(7) a. Nina invited *X*.
b. Nina invited Adam and Miles, Nina invited Adam and Agatha, ...

What is then added to the core meaning of the cleft is the information that none of these stronger focus alternatives is true. The meaning components of a cleft are thus essentially the same as those of a sentence with *only*, but their status is different: (8a) presupposes (8b), while the negation of the alternatives (8c) is its assertive content. Consequently, the *only*-sentence (8a) is simply false, and its negation true, as soon as one of the negated alternatives is true.

(8) a. Nina invited only Adam.
b. Nina invited Adam. (presupposition)

c. It's not true that she invited Adam and Miles, it's not true that she invited Adam and Agatha, ... (assertion)

With clefts, the negations of the alternatives are clearly not asserted, since a failure of exhaustivity does not render the negation of a cleft true.

(9) a. Nina didn't invite only Adam. She also invited Miles.
b. #It wasn't Adam that Nina invited. She also invited Miles.

Different answers have been given to the question of what status the negations of these alternatives have, with the most crucial divide being that between pragmatic and semantic versions of the alternative-based approach.

2.1 The Pragmatic Variety: Implicatures

The oldest idea, coming from Horn 1981, is to view the negation of alternatives as a quantity implicature, which is known to disappear under negation. The positive sentence can be strengthened by negating stronger alternatives, but the negated sentence doesn't have stronger alternatives.

(10) It was Adam that Nina invited.
⇝ Nina invited Adam. (literal meaning)
⇝ Nina didn't invite anybody else. (implicature)

(11) It wasn't Adam that Nina invited.
⇝ Nina didn't invite Adam. (literal meaning)
(no implicature)

The problem, as pointed out by Velleman et al. (2012) and Büring & Križ (2013), is that exhaustivity is rather more robust than the normal exhaustivity implicature associated with any answer focus, seen in (12).

(12) A: Who did Nina invite?
B: She invited Adam. ⇝ She invited only Adam.

This exhaustivity is rather readily cancellable, unlike that of clefts. Note that this is not just a difference in the rate of derivation of the implicature (which has been found for different implicature-triggering items by van Tiel et al. 2016), since there is no reason why a more frequently derived implicature should be uncancellable.

(13) A: Who did Nina invite?
B: She invited Adam. And she also invited Ginger.

(14) A: Who did Nina invite?
B: She invited Adam.
A: Who else did she invite?

(15) A: Who did Nina invite?
B: It was Adam that she invited. #And she also invited Ginger.

(16) A: Who did Nina invite?
B: It was Adam that she invited.
A: #Who else did she invite?

No fully explicit proposal of a derivation of exhaustivity in clefts as a pragmatic inference that is different from other quantity implicatures has yet been given, and so it is unexplained — and arguably unexplainable — why it is more robust than them. It has been suggested that the robustness of exhaustivity has something to do with the fact that the speaker went out of their way to use such a marked construction as a cleft (Horn 1981, 2014, echoed by DeVeaugh-Geiss et al. 2015), and/or that it is somehow connected to the fact that clefts in addition have an additional existential presupposition (Horn 1981, 2014). However, no mechanism has been presented that implements these ideas, and so they remain quite unexplanatory.

The most explicit attempt at tackling this problem comes from DeVeaugh-Geiss et al. (2015). They propose to assume that an exhaustivity implicature is, in fact, obligatory with narrow focus. The reason for the apparently different cancellability of exhaustivity in clefts as opposed to canonical sentences is then traced to a difference in focus projection in these two types of sentences. Clefts, it is argued, are a construction used for the express purpose of marking narrow focus on or within the cleft pivot. Since focus is obligatorily restricted to the pivot, and exhaustivity obligatorily comes with narrow focus, exhaustivity should be difficult to cancel.

In canonical sentences, however, focus can project. This is most obvious and uncontroversial in the case of object focus: With the same intonation, (17) can be interpreted with narrow focus on the object *Adam* or the focus can project, leading to an interpretation with sentential focus.

(17) Nina invited Adam.

According to DeVeaugh-Geiss et al., instances of cancellation with canonical sentences are simply cases where the sentence is interpreted with broad (sentential) focus as opposed to narrow focus, so that the implicature was actually not there in the first place.[5] In sequence, the utterance that cancels the implicature may be viewed as triggering reanalysis of the preceding sentence.

The difference between a canonical sentence and an object cleft, as far as exhaustivity is concerned, therefore lies in a difference in the potential for focus to project from the object position as compared to the position of the cleft pivot. Referring to Büring 2006, DeVeaugh-Geiss et al. argue that focus on the subject of a canonical sentence is also not obligatorily narrow, so that even (18) can be interpreted with broad focus, avoiding exhaustivity with respect to the subject position.

(18) Nina invited Adam.

5 They do not address the question of why broad focus is not obligatorily associated with an exhaustivity implicature like *and nothing else of note happened*.

There are, however, two problems with this idea. The first is that examples (13) and (14) show canonical sentences as answers to an explicit *wh*-question, which by question-answer congruence should fix the focus to be narrow. A reinterpretation with broad focus should be impossible because question-answer congruence would be violated. Second, and more importantly, while it may be debatable whether narrow subject focus can always project to the sentential level, it is clearly unreasonable to assume that narrow focus on, for example, a possessor *within* a subject, as in (19), can do the same thing.

(19) Mr. Brown's daughter was corrupted by Agatha.

DeVeaugh-Geiss et al. would thus predict that in such a case, the canonical sentence should be just as robustly exhaustive as the corresponding cleft, which is not correct.

(20) Mr. Brown's daugther was corrupted by Agatha. And Mr. Mouse's daughter, too.

Note that if a workable pragmatic theory of exhaustivity in clefts could be found, it would make a distinctive prediction that would set if apart from both a presuppositional theory (to be discussed immediately below) and our own approach (to be presented shortly).

All of these theories predict that affirmative clefts have a status other than regular complete truth or falsity when exhaustivity is violated. For the presupposition-based theory, this would be a presupposition failure; for the referential theory, a homogeneity violation. In the case of the pragmatic theory, this would be because the cleft is literally true, but its pragmatically strengthened meaning is false. That a conflict between the truth value of the literal meaning and an implicature can lead to an intuition that a sentence is neither completely true nor completely false has been found in experiments by Križ & Chemla (2015) for the scalar implicature from *some* to *not all*.

For the presuppositional theory and the referential theory, nothing changes in the case of a negated clefts: In the same situation where an affirmative cleft has its special status, its negation has the same status. This is different for the pragmatic, implicature-based theory: There is simply no implicature whose truth value could clash with that of the literal meaning, and so there is simply plain old falsity. This predicted difference between affirmative and negated clefts could presumably be tested if a methodology were found that makes clearly visible the intermediate/special status of affirmative clefts in the face of homogeneity violations, possibly by an application of the very paradigm used by Križ & Chemla (2015).

2.2 The Semantic Variety: Inquiry Termination

Velleman et al. (2012) instead argue that the negation of relevant alternatives is, in fact, part of the semantics of clefts, building on similarities between clefts and sentences with *only*. They suggest that the meaning of a cleft sentence is exactly

that of the corresponding *only*-sentence except that assertion and presupposition are switched: The cleft asserts that the corresponding canonical sentence is true and presupposes that it is not the case that any of its stronger focus alternative is true.[6] The semantics of cleft formation is thus effectively the application of a focus-sensitive operator akin to *only*.[7]

(21) It was Adam that Nina invited.
⇝ Nina invited Adam. (assertion)
⇝ It's not true that she invited Adam and Miles, it's not true that she invited Adam and Agatha, ... (presupposition)

Negation targets only the asserted content and leaves the presupposition alone. This makes the presupposition vacuous insofar as it is automatically fulfilled when Nina didn't invite Adam, since in that case, she *a fortiori* didn't invite Adam and Miles.

(22) It wasn't Adam that Nina invited.
⇝ Nina didn't invite Adam. (assertion)
⇝ It's not true that she invited Adam and Miles, it's not true that she invited Adam and Agatha, ... (presupposition)

3 Clefts as Homogeneous Identity Statements

It is helpful to introduce some terminology at this point. We will call the focussed noun phrase that occupies the predicative position in the copular portion of the cleft the *pivot*, while the predicate that is abstracted over in the relative clause will be called the *cleft predicate*.

(23) It was $\underbrace{\text{Adam}}_{\text{pivot}}$ that $\underbrace{\text{Nina invited ___}}_{\text{cleft predicate}}$.

The referential theory of clefts takes seriously the involvement of a copula in cleft sentences and posits that in terms of their semantics, clefts are equivalent to specificational copular sentences: They identify what we will call the *cleft referent* as the pivot. The cleft referent is an individual that fulfils the cleft predicate, and we may think of it as obtained by turning the cleft predicate into a number-neutral definite description. (24a) is then essentially equivalent to (24b), with the cleft referent being the plurality of all the people who are guilty.[8]

6 The authors actually assume a more sophisticated analysis of clefts and *only* in terms of alternative answers to the (explicit or implicit) question under discussion, which is constrained by the focus structure of the sentence. The difference is immaterial for the points to be made in this paper.

7 The view that cleft formation corresponds semantically to the application of a focus-sensitive operator is also found in Hedberg 2013. The proposal there is, however, much less detailed on the question of the status of the exhaustivity implication, and the issue of the truth conditions of negated clefts is not touched upon.

8 We give an example with a plural pivot here so as not to run into problems with the number-neutrality of the cleft. (23) does not, strictly speaking, have a real copular sentence equivalent, since (ia) has an additional uniqueness presupposition in virtue of the singular morphology on the definite description, which (23) lacks, while (ib) is ungrammatical due to issues with number

(24) a. It's the girls that are guilty.
b. The guilty ones are the girls.

This yields exhaustivity automatically insofar as the definite description refers to the maximal plurality of guilty people, which is then identified with the girls. If the girls are only a subset of the guilty people (i. e. if exhaustivity is violated), then these two pluralities are not identical and so the cleft sentence isn't true. What then remains to be explained is why its negation isn't true in that case either, but requires that the girls are not guilty. In this section, we will show how this follows from a general property of plural predication in natural language.

3.1 Homogeneity and Plural Predication

Natural language sentences in which a property is ascribed to a plurality of individuals also have the property that their truth conditions are not complementary to those of their negations. That is to say, under certain conditions, such as when the predicate is true of some parts of the plurality and false of others, neither the affirmative sentence nor its negation is true.

(25) Situation: *Mr. Benfleet published half of the books in question.*
a. #Mr. Benfleet published the books.
b. #Mr. Benfleet didn't publish the books.

This has been analysed as a trivalence phenomenon under the name of *homogeneity*.[9] It plays out as follows: (26a) is true if Mr. Benfleet published all of the books, and false if he published none. When he published only some of them, then the sentence has a third, intermediate status. For convenience as well as historical reasons, we will call a sentence that has the third truth value *undefined*.

(26) Mr. Benfleet published the books.

true *all*
undef. *some, but not all*
false *none*

Negation simply switches the truth and falsity conditions of a sentence, so that when a sentence is undefined, its negation is as well. Hence both sentences in (25) are undefined.

(27) Mr. Benfleet didn't publish the books.

true *none*

agreement on the verb. The only way to render the meaning of (23) as a copular sentence is (ic), which is perhaps acceptable only in print.

(i) a. The one who Nina invited was Adam.
b. *The ones who Nina invited were/was Adam.
c. The one(s) who Nina invited was/were Adam.

9 Schwarzschild 1994; Löbner 1987, 2000; Gajewski 2005; Breheny 2005; Magri 2014; Križ 2015a. The view of homogeneity that we assume in this paper is that of Križ 2015a, building on Löbner 2000.

undef. *some, but not all*
false *all*

This contrasts with a properly quantificational sentence, where truth and falsity conditions are complementary (Löbner 2000).[10]

(28) Mr. Benfleet published all the books.

true *all*
undef. [never]
false *not all*

The negated sentence (29) is simply true when there is at least one book that Mr. Benfleet didn't publish, and so, unlike (25b), is clearly perfectly acceptable in the context in (25).

(29) Mr. Benfleet didn't publish all the books.

true *not all*
undef. [never]
false *all*

Homogeneity is a property of predicates as they apply to pluralities (Löbner 2000; Križ 2015a), and it is not restricted to one-place predicates. Sentences that express a relation between two pluralities also do not have complementary truth and falsity conditions. Some intricacies are involved in the question of what the truth conditions of such sentences are, the most common proposals for (30) being (30a) and (30b).

(30) The chaps kissed the girls.

a. **true** *if every chap kissed every girl.*
b. **true** *if every chap kissed a girl and every girl was kissed by a chap.*

The details of the truth conditions, however, are not important for our purposes (cf. e. g. Schwarzschild 1996, Champollion 2010). What is crucial here is that relational predications between pluralities are only false if no part of one plurality stands in the relation with any part of the other.

(31) The chaps didn't kiss the girls.

true *iff no chap kissed any girl.*

There are thus situations which are not included in even the weakest truth conditions that may reasonably be proposed (30), but which do not render its negation (31) true, either. In accordance with the trivalent view of homogeneity, both sentences are therefore undefined in, for example, a situation as in (32).

(32) The chaps kissed / didn't kiss the girls.

10 This has led to the characterisation of *all* as a *homogeneity remover* (Löbner 2000). There is, of course, the question of how it achieves this effect compositionally, and how quantifiers in general interact with homogeneity, which turns out to be highly non-trivial; cf. Križ 2015a.

3 of 10 chaps kissed a girl, 2 of 7 girls were kissed **undef.**

The essential point to take away from this, which we will make use of later on in the theory of clefts, is the generalisation about the falsity of relational plural predication:

(33) **Relational Falsity**
A relational predication between two pluralities a and b is false only if the relation does not hold between any part of a and any part of b.

When a plural predication is undefined in this way, we speak of a *homogeneity violation*.[11] Note that at this point, undefinedness is just a technical notion that was introduced in order to explain the behaviour of negation in certain sentences: it is a second type of non-truth that does not render negation true. It is not obvious that this theoretical status is always introspectively accessible; in particular, we may not be reliably able to distinguish introspectively the two different kinds of non-truth that the theory postulated. How undefinedness translates to intuitive truth-value judgements is therefore an additional question to be explored. Some experiments have been performed that shed light on this question, at least insofar as they indicate that there is an empirically observable difference between falsity and undefindeness.

Schwarz (2013) presented subjects with affirmative sentences that were undefined with respect to the accompanying visual display and asked them to rate them as either *true* or *false*, finding that responses varied in this case. Križ & Chemla (2015) used both affirmative and negative sentences, and gave their subjects the three answer options *completely true*, *completely false*, and *neither*. For sentences incurring a homogeneity violation, judgements were split between *completely false* and *neither*, with only a small proportion of *completely true* responses. This was in contrast to sentences with *all*, where subjects consistently answered *completely false* in the same situations. It can thus be said that, in the absence of much contextual information, the undefined status of a sentence translates, at least, to variability in (forced) judgements. Some further discussion of this point will follow below in section 3.4.

3.2 Homogeneous Identity

When we think about identity in logic or mathematics, it is an all-or-nothing affair: two objects are either identical, or they are not. Considerations of whether they overlap, or one is contained in the other, don't enter into the picture, and so the statement that an entity is identical to a plurality that properly contains it

11 This terminology is rooted in the notion that homogeneity is a condition that must be fulfilled in order for the predicate to have one of the two classical truth values, i.e. to be either true or false. The original formulation, for a distributive predicate P, is that $P(x)$ is only defined if x is homogeneous with respect to P, that is to say, if P is either true of all parts of x or false of all parts of x. This link to an intuitive notion of homogeneity is somewhat weakened once collective and n-ary predicates are taken into account, but the word has remained as a term of art.

(e. g. $a = a \oplus b$, when $a \neq b$) is plainly false and its negation ($a \neq a \oplus b$) is always true.[12]

Identity statements in natural language need not, however, reflect this bivalent notion of identity. If identity is just a regular relation between individuals that, like any other relation, is subject to homogeneity, then we expect identity statements to be sometimes undefined, in accordance with *Relational Falsity* in (33). In particular, for any two pluralities a and b, the following will hold:

(34) a is b.

true *iff a is identical to b.*
false *iff no part of a is identical to any part of b, i. e. a and b don't overlap.*
undef. *otherwise.*

There are then three types of scenarios where such statements are neither true nor false: (i) if a properly contains b; (ii) if a is properly contained in b; and (iii) if a and b overlap, but neither contains the other. These are exemplified below in (35)-(37). In each case, one would not accept either the positive sentence or its negation as unambiguously true of the situation, and this is the datum of primary importance for our purposes.

(35) Situation: *All the young people together are guilty of some transgression.*
$a \succ b$
a. #The culprits are the girls.
b. #The culprits aren't the girls.

(36) Situation: *Only the girls are guilty.*
$a \prec b$
a. #The culprits are the young people.
b. #The culprits aren't the young people.

(37) Situation: *Some of the girls and some of the chaps are guilty.*
$a \between b$
a. #The culprits are the girls.
b. #The culprits aren't the girls.

In the case of (35), a minimally different sentence can be found that has the same truth conditions (all and only the girls are guilty), but which is clearly false (and therefore has a true negation) in the scenario described.[13]

(38) Situation: *All the young people together are guilty of some transgression.*
$a \succ b$
a. #The culprits are just the girls / the girls alone.
b. ✓The culprits aren't just the girls / the girls alone.

12 We are presupposing the usual mereological view of pluralities as the denotations of plural definite descriptions from Link 1983.

13 Cf. also section 6.2 later on.

The contrast between (35b) and (38b) makes the former's infelicity come into particularly sharp view. A similar contrasting example exists for (36):[14]

(39) Situation: *Only the girls are guilty.*
$a \prec b$
a. #The culprits are all the young people.
b. ✓The culprits aren't all the young people.

3.3 Exhaustivity and Trivalence in Clefts

In order to explain the odd behaviour of clefts in the face of an exhaustivity violation, where neither the affirmative cleft nor its negation is true, we now merely need to apply this idea of the homogeneity of identity to clefts. (40) is then true if and only Adam is identical to the mereological sum of all the people who came, that is, if Adam and only Adam came. It is false if and only if Adam does not overlap with the mereological sum of all people who came, i. e. if Adam didn't come.

(40) It was Adam that came.
true *iff Adam and only Adam came*
false *iff Adam didn't come*
undef. *otherwise*

The classic exhaustivity violation, where both Adam and someone else came, is now a homogeneity violation which causes the sentence to be undefined. Since negation just switches around truth and falsity conditions, it follows that a negated cleft simply expresses that the cleft predicate is false of the cleft referent with no implications about anybody else.[15]

(41) It wasn't Adam that came.
true *iff Adam didn't come*
false *iff Adam and only Adam came*
undef. *otherwise*

Additional consequences of our theory come to the fore once we take into account clefts with plural pivots. Applying the statement of homogeneous identity from (34) above, we obtain overall truth, falsity, and undefinedness conditions as in (42):

14 The only potential non-homogeneous sentence that we could find for the case of (37), which is clearly plainly false in the scenario in question, is the rather excessively precise (ia), whose negation (ib) is, it seems to us, somewhat unnatural, except perhaps with focus on negation in direct response to (ia).

(i) a. The culprits are all and only the girls.
b. The culprits are not all and only the girls.

15 We are ignoring here the existence presupposition of clefts, to be discussed below in section 5.2. Cf. also fn. 1 on a different reading of the negated cleft.

(42) It was the girls that came.

true *iff all and only the girls came.*
false *iff no girl came.*
undef. *otherwise.*

A homogeneity violation thus occurs not only when the pivot is a proper part of the cleft referent, but whenever it overlaps with the cleft referent without being identical to it. We therefore predict that a cleft is undefined also when the pivot properly contains the cleft referent and when the two merely overlap. This seems to be supported, as the relevant judgements appear to us to be analogous to those for copular sentences discussed in the previous section; that is to say, neither the affirmative cleft nor its negation is fully felicitous.

(43) Situation: *All the young people together are guilty of some transgression.*
pivot $\prec$ cleft referent

a. #It's the girls that are guilty.
b. #It isn't the girls that are guilty.

(44) Situation: *Only the girls are guilty.*
pivot $\succ$ cleft referent

a. #It's the young people that are guilty.
b. #It isn't the young people that are guilty.

(45) Situation: *Some of the girls and some of the chaps are guilty.*
pivot $\between$ cleft referent

a. #It's the girls that are guilty.
b. #It isn't the girls that are guilty.

Just as for copular sentences in the preceding section, we can find a contrast with corresponding non-homogeneous sentences.

(46) Situation: *All the young people together are guilty of some transgression.*
$a \succ b$

a. #It's just the girls / the girls alone that are guilty.
b. ✓It's not just the girls / the girls alone that are guilty.

(47) Situation: *Only the girls are guilty.*
$a \prec b$

a. #It all the girls that are guilty.
b. ✓It's not all the girls that are guilty.

On the alternative-based approach to clefts, undefinedness due to an exhaustivity violation occurs only when the cleft predicate is true of both the pivot and also some other individual in addition. However, it does not follow that cleft sentences are plainly true or false in the situations with mere overlap (or inclusion in the inverse direction). After all, homogeneity is independently established as a phenomenon and the canonical sentence that is assumed to underly the cleft is subject to it.

(48) a. It was the girls that came.
b. The girls came.

(48b) is the simplest, prototypical case of a homogeneous predication: the sentence is undefined when only some of the girls came. Thus, once the alternative-based theorist recognises this, he predicts that, in virtue of the underlying canonical sentence being undefined, the cleft (48a) is also undefined whenever some, but not all of the girls came. It is just that for him, this homogeneity-based undefinedness is different from the exhaustivity-based undefindeness that arises when somebody other than the girls also came.

3.4 Judgements of Undefinedness

We mentioned in section 3.1 that in experiments with a truth-value judgement task, sentences that are undefined are associated with variability in judgement. In this section, we would like to report and discuss a set of intuitions which corroborate the parallelism between the types of sentences discussed in the previous section: plain plural predication, copular sentences with plural definite descriptions, and clefts.

Introspectively, the authors of this paper find undefinedness to be sometimes reflected in hesitation as to the appropriate reply, with a preference for replying neither *yes* nor *no*, but *well* followed by a correction (at least in out-of-the-blue contexts).

(49) Situation: *Mr. Benfleet published half of the books.*
A: Mr. Benfleet published the books.
B: Well, HALF of them.
B′: ??No, only HALF of them.
B″: ??Yes, (but only) HALF of them.

While the precise shade of felicity of these responses is difficult to determine, it seems quite clear that the pattern in (49) contrasts noticeably with that in (50). There we are dealing with the corresponding quantificational sentence with *all*, which is uncontroversially false in the situation in question, so that *no* is the natural answer and *yes* is clearly impossible.[16]

16 This contrast, and all others in this section, can be reproduced in the author's native German, with the particle *naja* playing the role of *well*.

(i) Situation: *Mr. Benfleet published half of the books.*
A: Benfleet hat die Bücher veröffentlicht.
B: Naja, die Hälfte.
B′: ??Nein, nur die Hälfte.
B″: ??Ja, (aber nur) die Hälfte.

(ii) Situation: *Mr. Benfleet published half of the books.*
A: Benfleet hat alle Bücher veröffentlicht.
B: Nein, nur die Hälfte.
B′: Naja, die Hälfte.
B″: #Ja, (aber nur) die Hälfte.

(50) Situation: *Mr. Benfleet published half of the books.*

A: Mr. Benfleet published all the books.
B: No, only HALF of them.
B′: Well, HALF of them.
B″: #Yes, (but only) HALF of them.

In the case of negated sentences, we again find a contrast between sentences with the plain definite plural and non-homogeneous sentences with *all*.

(51) Situation: *Mr. Benfleet published half of the books.*

A: Mr. Benfleet didn't publish the books.
B: Well, he did publish HALF of them.
B′: ??No, he did publish HALF of them.
B″: ??Yes, (but) only HALF of them.

(52) Situation: *Mr. Benfleet published half of the books.*

A: Mr. Benfleet didn't publish all the books.
B: Well, he did publish half of them.
B′: #No, he did publish half of them.[17]
B″: Yes, only half of them.

Let us now consider identity statements between pluralities in the form of copular sentences, in particular the case that we analogise to an exhaustivity violation in clefts: that were the subject plurality properly contains the plurality in predicative position. We find that our intuitions about preferred responses are comparable to those just seen. In particular, there is again a noticeable contrast between (53), where A's utterance is undefined, and (54), where A's utterance is plainly false.

(53) Situation: *All the young people together are guilty of some transgression.*
$a \succ b$

A: The culprits are the girls.
B: Well, ALL the young people are guilty.
B′: ??No, ALL the young people are guilty.
B″: ??Yes, together with the chaps.

(54) Situation: *All the young people together are guilty of some transgression.*
$a \succ b$

A: The culprits are just the girls.
B: Well, ALL the young people are guilty.
B′: No, ALL the young people are guilty.
B″: #Yes, together with the chaps.

A similar contrast also exists for the negations of the two sentences in question:

The German-speaking reader is invited to perform the relevant translations for the other examples. We see no reason to assume that German and English clefts differ semantically, although as a matter of stylistics, clefts are used more rarely in German.

17 This response is only appropriate on a very much dispreferred reading where *all the books* takes inverse scope above negation.

(55) Situation: *All the young people together are guilty of some transgression.*
$a \succ b$

A: The culprits aren't the girls.
B: Well, ALL the young people are guilty.
B′: ??No, the girls ARE guilty.
B″: ??Yes, all the young people are guilty.

(56) Situation: *All the young people together are guilty of some transgression.*
$a \succ b$

A: The culprits aren't just the girls.
B: ??Well, ALL the young people are guilty.
B′: #No, the girls ARE guilty.
B″: Yes, ALL the young people are guilty.

Clefts, it seems to us, produce essentially the same intuitions in a situation where exhaustivity is violated. Compare (57) and following to (53) and following.

(57) Situation: *All the young people together are guilty of some transgression.*
$a \succ b$

A: It's the girls that are guilty.
B: Well, ALL the young people are guilty.
B′: ??No, ALL the young people are guilty.
B″: ??Yes, together with the chaps.

(58) Situation: *All the young people together are guilty of some transgression.*
$a \succ b$

A: It's just the girls that are guilty.
B: Well, ALL the young people are guilty.
B′: No, ALL the young people are guilty.
B″: #Yes, together with the chaps.

(59) Situation: *All the young people together are guilty of some transgression.*
$a \succ b$

A: It isn't the girls that are guilty.
B: Well, ALL the young people are guilty.
B′: ??No, the girls ARE guilty.
B″: ??Yes, all the young people are guilty.

(60) Situation: *All the young people together are guilty of some transgression.*
$a \succ b$

A: It isn't just the girls that are guilty.
B: ??Well, ALL the young people are guilty.
B′: #No, the girls ARE guilty.
B″: Yes, ALL the young people are guilty.

Note that the precise degree of infelicity of various responses above is not essential; what matters is, first of all, the contrast between undefined and plainly false sentences, and second, the comparability of judgements for the various

analogous undefined sentences. To the extent that these things are as they seem to us, a prediction of our theory is born out.

3.5 Interim Summary

In this section, we have presented our version of the referential approach to clefts. We argue that the cleft is semantically simply an identity statement between individuals, which may be pluralities or atomic individuals. One of these individuals is supplied by the pivot, while the other (the *cleft referent*) is obtained by turning the cleft predicate into a (number-neutral) definite description. It then follows without any additional construction-specific stipulations that a cleft is neither quite true nor quite false when the pivot is properly included in the cleft referent (i. e. when exhaustivity is violated). This is then simply an instance of the way in which relations in natural language, including the identity relation, are trivalent when applied to pluralities (the phenomenon of *homogeneity*). This idea of linking exhaustivity to homogeneity was first proposed by Büring & Križ (2013), but we have described it from the point of view of a different view of homogeneity.

Our main concern here was how to explain the interpretation of negated clefts, in particular the fact that their truth conditions are not complementary to those of affirmative clefts, on a referential view of clefts, and to show that an explanation is available very naturally and with independently motivated assumptions. We have not yet given much in the way of arguments for a referential analysis of clefts over a non-referential, alternative-based analysis; these will be presented in sections 5 and 6 below.

4 Comparison with Büring & Križ (2013)

In essence, what we have presented in the preceding section is a reconceptualisation of Büring & Križ's theory that brings together their central idea about clefts with a more developed view of homogeneity. In this section, we will discuss what we see as the shortcomings of their implementation that necessitate this update.

Büring & Križ (2013) (BK) posit that the definite article, which for them is of the type of a generalised quantifier, introduces a presupposition. The assertive meaning of (61) is simply that the scope predicate holds of the maximal restrictor individual. The presupposition is that either the sentence is true, or the scope is not true of any proper part of the maximal restrictor individual.

(61) The As are B.
ass: $B(\max(A))$
pres: $B(\max(A)) \vee \neg\exists x : B(x) \wedge x \prec \max(A)$

Consequently, we obtain the following:

(62) The As are B.

true *iff B is true of the maximal A.*
false *iff B is false of all parts of the maximal A.*
pres. failure *iff B is not true of the maximal A, but is true of a proper part of the maximal A.*

Clefts are taken to be equivalent to the corresponding identity statements with a definite description formed from the cleft predicate in just the way that we have been discussing. Consequently, both the cleft (63a) and the corresponding copular sentence (63b) have the meaning in (63b).

(63) a. It was Adam that Nina invited.
b. The person Nina invited was Adam.
c. $[\![\text{the}]\!](\lambda x.\mathit{invited}'(\mathit{Nina}', x))(\lambda y.y = \mathit{Adam}')$

More generally, the meaning of a cleft with cleft predicate P corresponds to the combination of the pivot with the predicate in (64), with the part between : and . being a presupposition.

(64) $\lambda x : x \not< \max(P).P(x)$

There are three important points to consider about this implementation of the referential theory of clefts in comparison to our view. We will first discuss the issue of equating undefinedness due to a homogeneity violation with a presupposition failure. We will then turn to the question of the source of homogeneity, which BK see in the definite description, while we assume that it is the predicate. Finally, we will discuss the question of whether there is any difference in predictions for clefts in particular between BK's version of the referential theory and ours. It turns out that BK's theory, as it is given by them, is not actually defined for clefts where the pivot is a definite description, but once the blanks are filled in the natural way, the predictions for the truth and falsity conditions of cleft sentences are, in fact, identical to ours.

4.1 Homogeneity is Not a Presupposition

BK speak of homogeneity as a presupposition, following much of the literature, though with some reluctance, as they all but say explicitly that they do so merely for lack of alternatives and do not want to strongly commit to a particular status of the neither-truth-nor-falsity that is observed with definite descriptions and cleft sentences, as long as it is the same in both cases. Indeed, strong arguments have been made to the effect that the undefinedness in the case of a homogeneity violation is conceptually quite different from a presupposition failure. These come in two shapes.

The first argument concerns a difference in the projection pattern in complex sentences: these are simply not analogous for presuppositions and homogeneity. Consider the antecedent of a conditional, discussed in Križ 2015a. Under most circumstances, presuppositions project from this context. Thus, (65) is normally understood as presupposing that Adam bought a ring.

(65) If Nina knows that Adam bought a ring, she's probably upset. $\rightsquigarrow$ Adam bought a ring.

If homogeneity violations were presupposition failures, then we should expect them to project analogously, and we should find the implication in (66), which is manifestly absent.

(66) If the subjects are asleep, we can start our study. $\not\rightsquigarrow$ Either all or none of the subjects are asleep.

The same argument was made by Spector (2012) based on a different embedding context. It is quite clear that, absent local accommodation, presuppositions project universally from the scope of negated universal quantifiers.

(67) Not all the students stopped smoking. $\rightsquigarrow$ All the students used to smoke.

The corresponding inference for definite plurals in (68) is clearly absent, as confirmed by experimental data from Križ & Chemla 2015. Those results show that the sentence is judged as simply true as soon as one student read none of the books, no matter how many the others read.

(68) Not all the students read the books. $\not\rightsquigarrow$ All of the students read either all or none of the books.

The second type of argument consists in direct evidence for the different status of presupposition failures and homogeneity violations coming from the kind of reaction that they warrant on the interlocutor's part. When a presuppositional sentence is uttered without the presupposition being common ground between the participants of the conversation, the hearer can (though need not) object to this.

(69) A: Does John know that Mary bought some jewels?
B: Wait a minute! I didn't know that Mary bought any jewels.

As Spector (2012) points out, the analogous objection is not felicitous in the case of a homogeneity violation.

(70) A: Did Mary buy the jewels?
B: #Wait a minute! I didn't know she couldn't possibly have bought only some of them.

This, of course, assumes that the putative homogeneity presupposition projects from questions. Spector (2012) notes that the argument is weak insofar as presuppositions are often not too difficult to accommodate locally within a question, and the infelicity of B's reply in (70) may simple be due to the fact that their unwillingness to accommodate an easy-to-accommodate presupposition, locally or globally, is perceived as unreasonable.

As a similar argument in the same category, Križ (2015a) points out that the hesitant, deliberating *well*-answers so natural for homogeneity violations are not equally applicable to presuppositions.

(71) A: Mr. Benfleet published the books.
B: Well, half of them (anyway).
B′: Weeell...

This is not to say that *well* can never feature in replies to presupposition failures, and indeed an answer very much analogous to B's above is possible. What is rather more unnatural, however, is the drawn-out, deliberative *well* of B′.

(72) A: Adam has stopped smoking.
B: Well, he doesn't smoke now (anyway) / he never smoked in the first place.
B′: #Weeell ...

We take it that these observations together quite establish satisfactorily that homogeneity violations are not to be equated with presupposition failures as we know them. While not exactly essential to BK's theory, their phrasing of things in terms of presuppositions is apt to give an impression that is important to dispel, namely that clefts have an additional meaning component separable from the assertion, in the sense that the truth of the assertive meaning component and the truth of the presupposition can be evaluated separately. There is only one meaning component, the presupposition that is being asserted — it just happens to be a trivalent proposition.[18] Note, however, that BK's entire discussion and all applications of their theory are easily reinterpreted in terms of whatever kind of trivalence homogeneity actually is, be it even *sui generis*.

4.2 The Source of Homogeneity

BK assume that homogeneity is introduced by the definite description This assumption, made, in a different form, also by Breheny (2005) and Magri (2014), may receive some initial plausibility from the fact that homogeneity seems to disappear when the definite description is replaced with a quantificational noun phrase. There are, however, good reasons to think that the source of homogeneity is, in fact, the predicate, and not the definite description (Löbner 2000, Križ 2015a).

As Löbner (2000) observes, homogeneity appears not only when a predicate is ascribed to a plurality, but in many cases where a predicate is ascribed to a mereologically complex object. That is to say, homogeneity exists not only with respect to the relation that holds between plural individuals and the individuals that constitute them (named *individual parthood* by Link 1983), but also with respect to material or other parthood relations. For example, *read* is not only homogeneous with respect to pluralities of books, but also with respect to single books. For a fuller presentation of the relevant data, including contrastive judgements with non-homogeneous counterparts, we refer the reader to Löbner 2000 and Križ 2015a.

(73) a. Mr. Benfleet read the book. ⇝ Mr. Benfleet read the whole book.

18 We are ignoring here the existence presupposition of clefts, to be discussed in section 5.2.

b. Mr. Benfleet didn't read the book. ⇝ Mr. Benfleet didn't read any part of the book.

To be sure, (73) by itself does not pose a challenge to the view that homogeneity somehow comes from the definite description, since it does contain a definite description. However, the phenomenon can easily be replicated with a proper name.

(74) a. Mr. Benfleet read *Vile Bodies*. ⇝ Mr. Benfleet read the whole of *Vile Bodies*.
b. Mr. Benfleet didn't read *Vile Bodies*. ⇝ Mr. Benfleet didn't read any part of *Vile Bodies*.

At this point, we have to assume that it is not only definite descriptions, but also proper names that introduce homogeneity.[19]

The argument, however, goes further. These different levels of homogeneity can, so to speak, stack, and they can be separately removed by adverbs. (75a) is true if *Mr. Benfleet read* __ is true of every book, which means that Mary has to have read the whole book. It is false if *Mr. Benfleet read* __ is false of every book, i.e. if Mr. Benfleet didn't read any part of any book.

(75) a. Mr. Benfleet read the books. ⇝ Mr. Benfleet read the entirety of every book.
b. Mr. Benfleet didn't read the books. ⇝ Mr. Benfleet didn't read any part of any book.

The addition of *all* removes homogeneity with respect to individual parthood (i.e. the plurality), but does not touch homogeneity with respect to material parthood (i.e. the individual books).

(76) Mr. Benfleet read all the books.

true *iff Mr. Benfleet read the entirely of every book.*
false *iff there is at least one book of which Mr. Benfleet read no part.*
undef. *otherwise*

Consequently, in the scenario in (77), both the affirmative sentence and its negation are neither quite true nor quite false in the way typical of homogeneity violations.

(77) Situation: *Mr. Benfleet read half of each book.*
a. #Mr. Benfleet read all the books.
b. #Mr. Benfleet didn't read all the books.

At the same time, it is also possible to have an adverbial selectively remove homogeneity at the lower level, that is, with respect to individual books, using

19 An anonymous reviewer points out that such a thing is conceivable in roughly the following way: assume that it is not actually the lexical entry of the definite article that introduced homogeneity, but rather a silent operator whose insertion is triggered by a morphosyntactic definiteness feature common to all entity-referring expressions such as definite descriptions and proper names.

the adverbial *from beginning to end*.[20] In particular, (78b) is not straightforwardly true in a situation where Mr. Benfleet read half of the books from beginning to end and didn't touch the other half.

(78) a. Mr. Benfleet read the books from beginning to end. ⇝ Mr. Benfleet read every book from beginning to end.
b. Mr. Benfleet didn't read the books from beginning to end. ⇝ Mr. Benfleet didn't read any book from beginning to end.

Of course, it is also possible for adverbials to co-occur to remove homogeneity with respect to both levels. In (79), homogeneity is kept with respect to the plurality of books, so that the predicate *read __ from beginning to end* has to be true of either all or none of the books. But homogeneity with respect to material parthood is gone, in that this predicate is false of a book as soon as there is any part of the books that Mary failed to read.

(79) a. Mr. Benfleet read all the books from beginning to end.
b. Mr. Benfleet didn't read all the books from beginning to end. ⇝ There is at least one book that Mr. Benfleet read only partially.

It is difficult to see how this layered picture could be made sense of if homogeneity is supposed to be somehow contributed by the noun phrase instead of the predicate.

4.3 Predictions for Clefts

Independently of the inadequacies of BK's conception of homogeneity, one may ask whether their version of the referential approach to clefts ever predicts truth and falsity conditions for clefts that are different from our predictions.

Recall from section 3.3 that the conception we have presented predicts that there are three mereological relationships between the pivot and the cleft referent that make a cleft undefined. (80a) is an exhaustivity violation, whereas (80b) and (80c) are additional types of homogeneity violations.[21]

(80) a. pivot $\prec$ cleft referent (pivot contained in cleft referent)
b. pivot $\succ$ cleft referent (pivot contains cleft referent)
c. pivot $\between$ cleft referent (overlap without containment)

BK state that their theory predicts undefinedness only in situation (80a). This is correct, given their assumptions, for the pivots in their examples. These are always conjunctions of proper names, which they take to simply denote the mereological fusion of the relevant individuals.

(81) It was Adam and Miles that Nina invited.

20 A reading of *from beginning to end* with respect to the whole plurality of books may be available when the context makes salient an order in which the books might or ought to be read, such as with a series of books. The example discussed here assumes a random assortment of books with no inherent order.

21 Analogous relations apply, on both theories, for copular sentences with definite descriptions.

$$\begin{aligned}\text{ass:}\quad & \mathit{Adam}' \oplus \mathit{Miles}' = \max(\lambda x.\mathit{invited}'(\mathit{Nina}', x)) \\ \text{pres:}\quad & \mathit{Adam}' \oplus \mathit{Miles}' = \max(\lambda x.\mathit{invited}'(\mathit{Nina}', x)) \\ & \qquad\qquad \vee \max(\lambda x.\mathit{invited}'(\mathit{Nina}', x)) \not< \mathit{Adam}' \oplus \mathit{Miles}'\end{aligned}$$

The presupposition of (81) is clearly satisfied as soon as Nina didn't invite both Adam and Miles. Thus, (82a) should be false, and its negation (82b) clearly true, in the situation in question.

(82) Situation: *Nina invited only Adam.*

a. It was Adam and Miles that Nina invited.

b. It wasn't Adam and Miles that Nina invited.

We find these judgements intuitively rather unclear when *and* is unstressed, but clearly correct when *and* is focussed. This, however, appropriately aligns with how homogeneity behaves in general with respect to conjunction: A sentences with stressed conjunction is false as soon as the predicate is false of at least one conjunct. For example, (83a), with stressed conjunction, is clearly false, and its negation (83b) clearly true. The judgements are slightly less clear with unstressed conjunction.[22]

(83) Situation: *Nina invited only Adam.*

a. Nina invited Adam AND Miles.

b. Nina didn't invite Adam AND Miles.

Our own theory does not make any particular predictions for this case, since we wish to remain agnostic about how precisely conjunction and homogeneity interact. Our approach merely makes the general predication that the behaviour of conjunctions in clefts should align with how they interact with homogeneous predication in general.[23]

The first possibility is that conjunctions denote simple mereological fusions, in which case we predict that clefts with conjunctive pivots should be false in all three types of situations in (80), and in general predicates should be false of conjunctions only if they are false of all conjuncts.

The second possibility is that conjunction removes homogeneity in the same way as *all*; that is to say, the sentence is rendered false as soon as the predicate is false of at least one conjunct.[24] In this case, we make the same prediction as BK: that clefts with conjunctive pivots are false in situations of type (80b) and (80c), where at least one conjunct is not contained in the cleft referent, so that the predicate "is [the cleft referent]" is false of this conjunct and hence of the whole conjunction. Note that we still predict that such clefts are undefined in situations of type (80a), where the pivot is properly contained in the cleft referent:

22 Cf. Szabolcsi & Haddican 2004 for some discussion of whether, and when, conjunction leaves homogeneity intact.

23 BK could, of course, have remained similarly agnostic; they merely chose to make a commitment on how conjunction interacts with homogeneity. If desired, one could add a presupposition to conjunction analogous to that of the definite article.

24 For a formal treatment of this notion of homogeneity removal, we again refer the reader to Križ 2015a: §1 and §2.

here, the predicate is undefined of both conjuncts, and so undefined of the whole conjunction. Thus, we still correctly predict undefinedness in the case of an exhaustivity violation.

We will now turn to the case of definite plurals in pivot position, which is not, in fact, discussed in the original BK paper. Unfortunately, BK employ direct interpretation with the notation from Heim & Kratzer 1998 for definedness conditions, which is not part of a well-specified formal system that systematically determines the definedness conditions of complex sentences, so that it is not straightforwardly possible to derive any predictions at all for this case. We therefore restate BK's lexical entries in a trivalent language into which we assume natural language to be translated by a translation function $\|\cdot\|$. All lexical constants of the language are interpreted as bivalent predicates, but there is an additional binary propositional connective $|$ that introduces trivalence: $\phi|\psi$ has the truth value of ϕ if ψ is true and otherwise has the third truth value. Thus, $\phi|\psi$ can be understood roughly as "ϕ with definedness condition ψ". For improved readability, we will write $\phi|\underline{\psi}$, with the definedness condition underlined. The standard connectives and quantifiers have their Strong Kleene meaning, since there is independent evidence that that is the logic of homogeneity.[25] In addition, we have the binary relation $\prec$ which represents mereological parthood and the function $\max(\cdot)$ which picks the mereologically maximal individual of which a predicate is true.[26]

We can now look at a cleft sentence with a definite description as the pivot:

(84) a. It's the girls that are guilty.
b. $\|\text{the}\|(\|\text{girls}\|)(\lambda y.\|\text{the}\|(\|\text{guilty}\|)(\lambda z.y = z))$

The relevant translation for the definite article is as in (85).

(85) $\|\text{the}\| \equiv \lambda P.\lambda Q.Q(\max(P))|\underline{Q(\max(P)) \vee \neg\exists x : Q(x) \wedge x \prec \max(P)}$

Now we can unpack at least a subformula of (84b):[27]

(86) $\lambda y.\|\text{the}\|(\|\text{guilty}\|)(\lambda z.y = z) \equiv \lambda y.y = \max(\mathit{guilty}')|\underline{y \not\prec \max(\mathit{guilty}')}$

In order to fully unpack (84b), we have to apply $\|\text{the}\|(\|\text{the girls}\|)$ to (86), which results in the following forest of symbols:

(87) $\|\text{the}\|(\|\text{girls}\|)(\lambda y.\|\text{the}\|(\|\text{guilty}\|)(\lambda z.y = z)) \equiv$
$(\max(\mathit{girls}') = \max(\mathit{guilty}')|\underline{\max(\mathit{girls}') \not\prec \max(\mathit{guilty}')})|$
$\underline{(\max(\mathit{girls}') = \max(\mathit{guilty}')|\underline{\max(\mathit{girls}') \not\prec \max(\mathit{guilty}')})\vee}$

25 Cf. Križ & Chemla 2015. They do find some deviations from Strong Kleene logic, which, however, are irrelevant for our purposes here, as they appear only with non-monotonic quantifiers such as *exactly*.

26 With BK, we assume, for simplicity, that all predicates are closed under mereological fusion so as to not have to deal with the partiality of the maximality operator.

27 BK package the application of a definite description to the identity relation into a separate operator that they call CLEFT. Thus, the expression in (86) corresponds to $\text{CLEFT}(\lambda x.\text{guilty}(x))$ in their notation.

$$\underline{\neg\exists x : (x = \max(guilty') | \underline{x \not\prec \max(guilty')}) \wedge x \prec \max(girls')}$$

To understand what this amounts to, it is useful to look separately at the subexpressions that are the two disjuncts of the disjunction spanning the last two lines of (87).

(88) $(\max(girls') = \max(guilty') | \underline{\max(girls') \not\prec \max(guilty')})$

(88) is true if the girls are the guilty people and undefined if the girls are properly included in the guilty people.

(89) $\neg\exists x : (x = \max(guilty') | \underline{x \not\prec \max(guilty')}) \wedge x \prec \max(girls')$

Given the definition of $|$ and the Strong Kleene meaning of the connectives and quantifiers, (89) is true iff for all $x \preceq \max(guilty')$, $x \not\prec \max(girls')$, that is to say, iff no girl is guilty.

The disjunction of (88) and (89) therefore means that either all and only the girls are guilty or no girl is guilty, and this ends up being the definedness condition of the overall formula in (87). Thus, (87) is true if all and only the girls are guilty, and false if no girl is guilty, which is the same trivalent meaning that our theory predicts. Thus, it turns out that once a point of ill-definedness in BK's theory is repaired in a reasonable way, its predictions are, in fact, identical to those of our theory.

4.4 Interim Summary

In this section, we have discussed how BK's implementation of the homogeneity-based referential theory of clefts differs from ours. The difference turned out to be essentially conceptual, in that theirs rests on a conception of homogeneity that is not compatible with what is known about the phenomenon independently: contrary to what BK assume, homogeneity is neither a presupposition nor triggered by the definite article. In terms of actual empirical predictions about clefts in particular, BK's theory is in some places ill-defined, but once this is remedied in the natural way, the predictions turn out to be entirely identical to ours. The theory we have presented is thus simply to be viewed as an update of BK's that is needed to bring the approach in line with the wider-reaching picture of homogeneity painted by Löbner 2000 and Križ 2015b.

5 Finding the Cleft Referent

A consequence of the referential view is that clefts are, strictly speaking, exhaustive only with respect to the cleft referent: They are true if and only if the cleft referent consists of the pivot and nothing else. Whether the cleft sentence is exhaustive with respect to the cleft *predicate* therefore depends on the relation between the cleft predicate and the cleft referent. The natural candidate for this relation is that the cleft referent is obtained by turning the cleft predicate into

a definite description. This is argued for in greatest detail by Hedberg (2000), who draws parallels between clefts with *it/that/this* and definite plural noun phrases with *the/that/this*, respectively. Prototypically, definite descriptions refer to the maximal individual that fulfils the restrictor predicate, which in the cleft translates to maximality of the cleft referent with respect to the cleft predicate and hence exhaustivity. However, clefts show a wider range of uses than just these most prototypical examples, and the current section is devoted to discussing these with respect to how they support the referential approach. We find that their behaviour is paralleled by that of definite descriptions even in numerous cases where we do not actually have an explanation for why the latter behave in the way they do, but we are not so ambitious as to attempt an explanation of every aspect of the meaning of clefts and definite descriptions. For our purposes, it is sufficient to show that one can be reduced to the other.

5.1 Anaphoric Clefts

It is well-known that clefts are often anaphoric, serving to specify the identity of an established discourse referent (cf. especially Hedberg 2000 and Pollard & Yasavul in press). In fact, such anaphoric clefts are rarely, if ever, full cleft sentences: the cleft predicate is usually missing.

(90) Someone entered wearing black suede shoes. It was a distant acquaintance of Adam's.

However, as Beaver & Onea (2015) point out, anaphoric clefts with pronounced cleft predicates are natural when the antecedent cannot otherwise be unambiguously determined.

(91) a. Someone came in black suede shoes and someone else arrived in a green bowler hat.
b. It wasn't Adam that wore the green bowler hat.

Pollard & Yasavul (in press) also argue that the case of clefts used to answer a *wh*-question can be subsumed under the anaphoric use. For them, a *wh*-question introduces as a discourse referent the maximal individual which fulfils the predicate of the question, and the identity of this individual is then specified by the anaphoric cleft. Thus, they conclude that exhaustivity is not a part of the semantics of clefts and merely arises as an epiphenomenon when the referent that the cleft specifies is maximal with respect to the cleft predicate (as in the case of answering *wh*-questions). Crucially, however, they neglect the issue of the conditions under which clefts are undefined rather than false, which depend on the relation between the pivot and the cleft referent (but not on the relation between the pivot and the cleft predicate). Recognising the homogeneity of identity statements allows an explanation of exactly these facts.

The parallel with definite descriptions is, of course, upheld here, since those also exist in an anaphoric variety. Such anaphoric definite descriptions pick up some previously established discourse referent while presupposing that it fulfils

the restrictor predicate.[28] Plausibly, reduced anaphoric clefts without an overt cleft predicate then relate to full clefts in the same way that pronouns relate to definite descriptions.

(92) a. The hostess grudgingly welcomed [another man in black suede shoes]$_i$. The guest$_i$ was rather displeased.

On the alternative-based approach to clefts, there cannot be anaphoric reference to an individual. But canonical sentences without such anaphoric reference can also be used to address an identity question, just like an anaphoric cleft or a copular sentence with an anaphoric definite description, as shown in (93).

(93) A: Yesterday, I saw a man in a green bowler hat. Who might that have been?
B: It must have been Adam that you saw.
B′: The fellow you saw must have been Adam.
B″: You must have seen Adam.

What remains to be explained is why none of these possible answers are actually exhaustive with respect to the cleft predicate, since they certainly don't imply that A didn't see anybody else. To this end, one might assume that the answers are understood as referring only to the minimal perceptual situation that A was talking about, which involves merely A and the one man in the green bowler hat that A saw, so that exhaustivity is trivially fulfilled. The assumption that a sentence can implicitly be only about situations of just the right size allows the mimicking of direct anaphoric reference to individuals.

There is, however, still the issue of reduced clefts, which do not have a corresponding canonical sentence. In order for them to be even interpretable on the alternative-base theory, a cleft predicate needs to be somehow reconstructed, and it is not clear according to which precise rules this is supposed to happen. In particular, it is unclear what should explain the contrast between (94a) and (94b). In this example, inspired by one from Heim 1982, we see two sentences that are denotationally equivalent, but show strikingly different anaphoric potential: The fiancé can be picked up by an anaphoric cleft when he was explicitly mentioned, but not so well when his existence is merely entailed.

(94) a. Nina recently acquired a fiancé. It's a chap from her set.
b. Nina recently got engaged. ??It's a chap from her set.

But why should it be possible to reconstruct the cleft predicate *that she acquired as a fiancé* in (94a), but not *that she got engaged to* in (94b)?[29] In the absence of a principled answer to this question, it is necessary to assume a referential component in anaphoric clefts after all.

28 We wish to make no commitment here as to whether the different uses of definite descriptions, in particular the difference between situationally unique/maximal and anaphoric definite descriptions, are a matter of genuine ambiguity or not (cf. e.g. Schwarz 2009). If it is, indeed, ambiguity, then it would appear that clefts share the same.

29 The general strategy suggested, and the kind of problems it faces, are, of course, highly reminiscent of issues surrounding Elbourne's (2005) theory of E-type pronouns.

5.2 The Existence Presupposition and Informative Presupposition Clefts

The examples of clefts discussed so far all presuppose the existence of an individual of which the cleft predicate holds.[30] This falls out directly from the assumptions of the referential approach: A cleft referent needs to be chosen in order to assign a meaning to the cleft, and the cleft referent must be an individual that fulfils the cleft predicate. If no such individual exists, then the cleft suffers a presupposition failure in the same way as a definite description with an empty restrictor predicate because no referent can be established.

The alternative-based theory of clefts does not immediately predict an existence presupposition, since according to it, the assertive component of the cleft is just the meaning of the corresponding canonical sentence, which can be evaluated whether or not there is an individual that fulfils the cleft predicate. However, Velleman et al. (2012) propose another explanation for the appearance of an existence presupposition with clefts. The focus structure of the cleft determines the questions that the sentence can be used to address, where this question (the *question under discussion* may be explicit or implicit. Question-answer congruence requires that the focus alternatives of the sentence should be (a superset of) the answers to the question, where these answers are obtained by replacing the *wh*-word with an individual. Thus, the question corresponding to a cleft is always a *wh*-question about the extensions of the cleft predicate. (95a), for example, has the focus alternatives in (95b), which are the answers to the question (95c).

(95) a. It was Adam that Nina invited.
b. {Nina invited x}
c. Who did Nina invite?

According to Velleman et al., the existence presupposition that we see is, in fact, the existence presupposition of the *wh*-question in the background. On that assumption, it is, however, unclear why canonical sentences with narrow focus can be used to address a question about existence, while clefts cannot. Since their focus alternatives are identical to those of the corresponding canonical sentence, they should be usable to address the same questions, and since there is no existence presupposition apart from that of the question, there should be no problem with addressing a question that has no existence presupposition. The following example was already used by Rooth 1999 to argue for an independent existence presupposition in clefts over and above what is contributed by the effects of narrow focus:

(96) A: Did anyone win the football pool this week?
B: Probably not, because it's unlikely that Mary won it, and she's the only person who ever wins.
B: #Probably not, because it's unlikely that it's Mary who won it, and she's the only person who ever wins. (Rooth 1999)

30 The existence of such a presupposition of clefts is a standard assumption, cf. e. g. Halvorsen 1978 and Rooth 1999.

Another challenge comes from an observation by Pollard & Yasavul (in press). Sometimes, one can ask a *wh*-question without there being an understanding that there is any individual that fulfils the predicate, and indeed with the opposite expectation. Such a question cannot be answered by a cleft. This difference between a cleft and a canonical sentence is inexplicable if clefts obtain their existence presupposition from the question which they address.

(97) a. Jack Hanna: Okay kids, who likes snakes? [He expects that nobody does.]
b. Kid: Nobody!
c. Kid: Greg and Dan!
d. Kid: #It's Greg and Dan! (Pollard & Yasavul in press, ex. (10))

We should add that *only* can be used in response to questions asked in this manner, as in (98), which constitutes a divergence between the two that is problematic for Velleman et al.'s (2012)'s theory.

(98) Kid: Only Greg!

A further observation in this vein is the following: While a regular *wh*-question can sometimes be asked in this manner, this is never possible with a cleft question. Thus, it would have been infelicitous in the above context to ask (99):

(99) #Okay kids, who is it that likes snakes? [Expecting the answer 'nobody'.]

It is therefore clear that Velleman et al.'s (2012)'s explanation for the existence presupposition of clefts is inadequate, and that the alternative-based theory of clefts forces one to simply stipulate this presupposition as an additional meaning component of clefting instead of deriving it.

Despite the robustness of the existence presupposition in the above examples, it is well-known that clefts can be used to introduce the fully new information that there is an individual that fulfils the cleft predicate and at the same time identify this individual as the pivot. Such utterances, which were brought into focus by Prince (1978), who calls them *informative presupposition clefts* and points out that they are characterised by the absence of deaccenting of the cleft predicate. An example is given in (100), which does not assume that the hearer is already familiar with the fact that Henry ford was responsible for the introduction of the two-day weekend.

(100) [Beginning of newspaper article] It was just about 50 years ago that Henry Ford gave us the weekend. (*Philadelphia Bulletin*, cited in Prince 1978)

The question arises whether these have the same semantic basis as instances of clefts (with merely a different pragmatics), or whether they should be taken to be a different construction entirely. In light of the syntactic identity of their construction, it would, of course, be preferable to maintain the first view, and we see no compelling reasons to give it up.

Even though informative presupposition clefts do not presuppose the existence or familiarity of the cleft referent in the mind of the hearer, this existence

implication does not seem to simply be part of the asserted content. Evidence for this comes, again, from questions: Informative presupposition clefts can be turned into questions and do not lose an existence presupposition that is as strong as that of a regular cleft, and therefore stronger than that of a canonical question. For example, (99) above is quite naturally pronounced with an accent on *snakes* and can be used in a situation where not everybody in the audience is aware that anybody likes snakes, effectively informing them of this fact. At the same time, the speaker, as we saw above, must take it for granted that someone likes snakes. This effect is stronger than for regular *wh*-questions (cf. the felicitous question in (97)), thus showing that there is an existential presupposition here that projects through the question formation.

This means that the way in which informative presupposition clefts convey the existence of the cleft referent must be through triggering some sort of accommodation procedure in the listener, and not through asserting it. This is paralleled by definite descriptions, which can also be quite readily used to inform the hearer of the existence of the referent.[31] For example, a reader of (101) is not necessarily expected to believe already that railways were opened in Russia in the second half of the 19th century.

(101) In the second half of the XIX century the importance of Vytegra fell — the opening of railways in Russia took away the most part of cargo shipped through the Mariinskaya waterway.

We need say no more about the process of accommodating referents to see that the referential view of clefts allows us to ascribe the same semantics to informative presupposition clefts as to the more commonplace varieties, with the difference lying only in their use, and that it furthermore explains the parallels between them and definite descriptions.

5.3 The Role of Focus

The way in which the placement of focus influences the meaning of clefts poses a challenge to the referential approach and has been a strong motivating factor for advocates of the alternative-based approach. This was particularly emphasised by Velleman et al. (2012) and Hedberg (2013), the latter even a former referential theorist. As far as we know, no explanation for the relevant data has yet been proposed within the framework of a referential theory of clefts.

In the examples we have seen so far, the pivot of the cleft was always a focus. But in fact, it is not necessary for the focus to be the whole pivot — it may also be smaller. When only a subconstituent of it is focussed, we obtain a cleft that is not exhaustive with respect to the cleft predicate.[32]

31 For a more detailed discussion of the pragmatics of informative presupposition clefts, cf. Delin 1992. She describes these cases as involving a sort of tacit pretense that the information is established, known, or uncontroversial, which explains why the presupposition cannot be informative when their truth is known to be in doubt, such as in (96) and (97) above.

32 (102) is adapted minimally, for thematic consistency, from an example given by Velleman et al. (2012) to make the same point.

(102) It was Mr. Brown's ELDEST daughter that went to the party.
⇝ No other daughter of Mr. Brown's went to the party.
↛ Mr. Brown's eldest daughter was the only guest.

This is easily explained on the alternative-based view, since the alternatives, being determined by focus, are all of the form in (103). Thus, by negating the relevant alternatives (*Mr. Brown's second-eldest daughter*, *Mr. Brown's youngest daughter*, etc.), we obtain exhaustification only restricted to the set of Mr. Brown's daugthers.

(103) Mr. Brown's *X* daughter went to the party.

On Velleman et al. 2012's view, the operation of cleft formation has a semantics that adds a presupposition in terms of negated focus alternatives. Clefts are thus semantically focus-sensitive in the same way as the focus-sensitive particle *only*. Support for this position comes mainly from the fact that the pivot of a cleft must obligatorily contain a focus and can never be deaccented. No matter where the focus is put in (104b), there is no context in which this sentence could be uttered.

(104) a. It was them that Nina invited.
b. #It was 'em that Nina invited.

However, it should be pointed out that the post-copular position in specificational copular sentence can also never be deaccented, even though it would be quite outlandish to say that such sentences involve a semantically focus-sensitive operator.[33]

(105) a. The new arrivals were them.
b. #The new arrivals were 'em.

Furthermore, with truly focus-sensitive constructions, extraction of the focused constituent out of the scope of the focus-sensitive element results in infelicitous, or at the very least highly marked sentences (Beaver & Clark 2008). This is not so for clefts, where extraction of the pivot is perfectly natural, as shown by the contrast in (106).

(106) a. *WHO did Adam only/even call?
b. Who was it that Adam called?

The idea that clefts are semantically focus-sensitive is therefore not particularly well-supported. This opens up the possibility of explaining the effect of focus in (102) as a pragmatic epiphenomenon. We discussed already above the standard assumption that the focus structure of a sentence constrains the explicit or

33 Note that what is essential is, again, merely the parallel. To the extent that one might judge (ia), modelled after an example suggested by an anonymous reviewer, to be acceptable after all, we predict that the corresponding cleft version (ib) is also acceptable. Velleman et al. 2012 have an argument for the conventional focus-sensitivity of clefts only if (ib) is degraded while (ia) isn't.

(i) a. The new arrivals SEEM to be 'em, but aren't.
b. It SEEMS to be 'em that came a moment ago, but it isn't.

implicit question under discussion that it can be used to answer. For example, it is intuitively obvious that (102) is not felicitous as an answer to the question who all the guests at the party were.

(107) A: Who came to the party?
B: #It was Mr. Brown's ELDEST daughter that went to the party.

Instead, the cleft sentence with narrow focus is only felicitous as an answer to the narrower question of which of Mr. Brown's daughters came to the party.

(108) A: Which of Mr. Brown's daughters came to the party?
B: It was Mr. Brown's ELDEST daughter that went to the party.

On the view defended here that clefts specify the identity of the cleft referent, the meanings of the focus alternatives of (102) are all of the form in (109a), where f is the choice function that yields the cleft referent based on the predicate. This means that all these focus alternatives entail that the cleft referent is one of Mr. Brown's daughters.

(109) $f(\lambda x.x$ came to the party$)$ is Mr. Brown's X daughter.

If the question to be answered were about all the people who came, then no choice for f could result in the focus alternatives being congruent with the answers to the question. The focus alternatives would cover only the subset of possible answers which entail that only one of Mr. Brown's daughters came to the party, but question-answer congruence requires that the focus alternatives contain all the answers to the question. Thus, the cleft cannot be used to address the question, and given that the cleft has been uttered, the question it is intended to answer must be a different one. There is only one way of chosing a question and a choice function f that makes sense of the sentence being uttered: The question has to be the one in (108), and f has to choose the daughter of Mr. Brown's who came to the party. We then correctly predict that it is presupposed that one of Mr. Brown's daughters came, but no inference about the coming of anyone who isn't a daughter of Mr. Brown's.

If we think in terms of definite descriptions, what we can manipulate to restrict its reference is the domain of discourse. This is a free parameter in any definite description that has to be chosen anyway: It is a rare occurrence that a plural definite description refers to the maximal restrictor individual in the whole universe, and instead it is understood to be restricted to the set of individuals relevant to the situation at hand. We might then expect to find a similar restricting effect of focus not only with clefts, but also with definite descriptions, and to a limited extent, we do.

(110) A: Which of Mr. Brown's daughters came to the party?
B: The young lady who came to the party was Mr. Brown's ELDEST daughter.

Appropriate domain choice so that the resulting proposition addresses the question properly is not the only way in which this example can be explained; it

cannot be excluded that the definite description is simply anaphoric to a discourse referent introduced by the *wh*-question. The same thing, however, can be said of clefts as well.

It must be admitted that such a reading is somewhat harder to obtain for definite descriptions than for clefts in the absence of an overt *wh*-question. Out of the blue, (111) suggests rather that there was a unique young lady at the party whose identity we are debating, with the options on the table being the various daughters of Mr. Brown. This contrasts with (102), where we understand immediately that what is at issue is which of Mr. Brown's daughters was at the party.

(111) The young lady who came to the party was Mr. Brown's ELDEST daughter.

We speculate that this has something to do with the presence and choice of the restrictor noun phrase, particularly in light of the fact that there is an alternative to (111) which does have the reading in question:

(112) The one who came to the party was Mr. Brown's ELDEST daughter.

Here the dummy nominal *one* appears to be cataphoric to the predicate *(be) Mr. Brown's daughter*. Given that this unambiguous alternative is available, it is perhaps perceived as less likely that (111) is intended to convey a meaning which can only be obtained by performing rather elaborate reasoning about covert questions and domain restriction, making the relevant interpretation difficult to access.

When it comes to the role of focus in clefts, we need to consider as a further complication the fact that there are cleft sentences which contain two focussed constituents, one in the pivot and one in the cleft predicate. An example of this is given in (113).[34]

(113) A: I know Adam and Nina spoke. But who called who?
B: It was ADAM that called NINA (as usual).

The crucial feature of such clefts is that they seem to lack the existence presupposition with respect to the cleft predicate: B's utterance does not presuppose that anybody called Nina. This is not a particular problem for the alternative-based view. If the meaning of cleft-formation is, as argued for by Velleman et al. (2012) and Hedberg (2013), a focus-sensitive operator that exhaustifies the cleft with respect to the focus, then *vice versa* clefts are not in any way special and nothing more needs to be said about them. Note that given what we have discussed in the previous section, it has to be stipulated that this focus sensitive operator also contributes an existence presupposition with respect to the focus position(s), so

34 This is clearly not a contrastive topic construction, as it doesn't have the right intonational contour and is a complete answer to a multiple *wh*-question, which is a context in which contrastive topic constructions are not used (Büring to appear). The two foci are also not nested — the focus alternatives of the sentence are simply obtained by replacing both foci independently. It is thus a case of what Krifka (1992, 2007) calls *complex focus*. See Hedberg 2013 for the same point. Such clefts, sometimes referred to as *vice versa* clefts, have been known since Ball & Prince 1977 and were also discussed by Carlson (1983).

that the cleft in (113) should presuppose that someone called someone. This prediction is borne out, as the cleft, unlike a canonical sentence with a complex focus, is not natural in a context where the existence presupposition is explicitly called into question. This is in accordance what we saw above in the discussion of (96).[35]

(114) A: Were there any phone calls made?
B: Probably not, because it's unlikely that Adam called Nina, and nobody else ever calls anyone.
B': #Probably not, because it's unlikely that it was Adam that called Nina, and nobody else ever calls anyone.

However, we have seen good reasons to abandon the alternative-based perspective, and so we need to find a way to make sense of *vice versa* clefts on the referential view. The first order of business is again to look at definite descriptions to see if we can replicate such curious cases there. So far, a cleft sentence has always been, so to speak, translated into a specificational copular sentence by turning the cleft predicate into a definite description in subject position. This does not yield an entirely satisfactory result in the given case: B's answer in (115) is, while perhaps not completely infelicitous, noticeably odder than the cleft in (113).[36]

(115) A: I know Adam and Nina spoke. But who called who?
B: ??The one who called Nina was Adam.

However, when the arguments are inverted, we suddenly have a perfectly fine sentence.

(116) A: I know Adam and Nina spoke. But who called who?
B: Adam was the one who called Nina.

These copular sentences raise two questions on their own: First, why is (115) degraded, and second, why is (116) natural, given that we should *prima facie* expect it to have an existence presupposition with respect to the restrictor of the definite description; the latter puzzle being identical to that raised by clefts.

Let us start by considering the second question. (116) could plausibly be a predicational copular sentence, and it has been argued that definite descriptions in predicative position sometimes lack an existence presupposition, while this reading is not available in subject position (Coppock & Beaver 2015). If the definite description in (116) carried no existence presupposition, then of course the acceptability of the sentence is explained. However, just as with the cleft in (114), we find that (116) is not actually acceptable when the existence presupposition is explicitly in doubt.

(117) A: Were there any phone calls made?

35 This also means that *vice versa* cleft is perhaps a bit of a misnomer insofar as it is not presupposed that either Adam called Nina or the other way around. However, the term is catchy and useful as a handle to refer to this particular type of clefts, and so we will continue to employ it.

36 The contrast between (115) and (113) was also already pointed out by Ball & Prince (1977).

B: #Probably not, because it's unlikely that Adam was the one who called Nina, and nobody else ever calls anyone.

This is not yet in itself a decisive argument, since Coppock & Beaver (2015) argue that even when a singular definite description has no existence presupposition, it still has a uniqueness presupposition (uniqueness conditional on existence). It could be that it is actually this uniqueness presupposition that is responsible for the infelicity of B's answer in (117), since A's question gives us no reason to take for granted that at most one person called Nina. However, A also does not explicitly call the uniqueness presupposition into question (unlike the existence presupposition), and indeed we find that the uniqueness presupposition is easily accommodated when not at issue. This is shown by (118), where the definite description is unproblematic even though it is not a given that the building was designed by a single person. What makes all the difference is that it is clear that the building was designed by *someone*, whether a single person or several people collaborating.

(118) A: Wasn't one of those people somehow involved in the construction of this building?
B: Probably not, because it's unlikely that John was the one who designed it, and nobody else has any relevant competence.

This indicates that the copular sentence in (116) is not actually entirely without an existence presupposition, it is just that the existence presupposition abstracts over the focus within the definite description, just as in the case of a cleft with a focus inside the cleft predicate, so that *the P[X]*, where *X* is the focus within *P*, does not presuppose that there is an individual in the extension of *P[X]*, but only that there is some *Y* that is a focus alternative of *X* and there is an individual in the extension of *P[Y]*.

In consequence, the presence of the existence presupposition cannot be what is responsible for the comparative oddness of (115), in which the definite description is in subject position. Rather, it seems that copular sentences with a focussed definite description in the syntactic subject position seem to be quite generally dispreferred, for reasons entirely unclear to us. In (119), the fact that we are talking about the construction of a building makes it obvious that there is an architect, and yet a copular with the focussed definite description *the architect* in subject position does not sound as natural as one with the inverse order or a cleft.

(119) A: Wasn't one of those people somehow involved in the construction of this building?
B: ??Yes, the architect was John.
B′: Yes, John was the architect.
B″: Yes, it was John who designed it.

This indicates that the semantic parallel between clefts and copular sentences with definite descriptions does actually hold up, even though it is entirely mysterious to us how exactly a focus within a definite description or cleft predicate actually manages to weaken the existence presupposition.

A challenge for this parallel comes from negated *vice versa* clefts, which may not have a fully natural analogue with definite descriptions.

(120) a. It wasn't Adam who called Nina, but the other way around.
b. ??Adam wasn't the one who called Nina, but the other way around.

However, we believe that there is an independent reason for the oddness that we perceive in (121a). What we are dealing with here is a correction sentence, and such sentences seems to have the peculiarity that the whole focus, whether simple or complex, ought to be in the syntactic scope of negation.

(121) a. ??Adam didn't come, but Miles.
b. She didn't see Adam, but Miles.

This in itself explains why (121a) is not as natural as its unnegated counterpart (116).[37] That this is what's at play in (121a) is supported by data from German, where it is possible to keep the subject of a copular sentence in the syntactic scope of negation by using an expletive pronoun. When this strategy is employed, the copular sentence is, in fact, as natural as a cleft.

(122) a. Es war nicht Adam, der Nina angerufen hat, sondern
it was not Adam who Nina called has, but
umgekehrt.
the.other.way.around
b. ??Adam war nicht derjenige, der Nina angerufen hat, sondern
Adam was not the.one who Nina called has, but
umgekehrt.
the.other.way.around
c. Es war nicht Adam derjenige, der Nina angerufen hat, sondern
it was not Adam the.one who Nina called has, but
umgekehrt.
the.other.way.around

Thus, we conclude that the way in which focus influences the meaning of clefts is not as much of a challenge to the referential theory as it might seem at first, insofar as it can either be explained or, when inexplicable, be shown to occur with definite descriptions as well.

5.4 Assorted Non-Exhaustivity

Some examples of non-exhaustive uses of clefts have been pointed out in the literature which involve neither narrow focus nor clearly discernible anaphoricity. One of them comes from a stanza of a poem by James Oppenheim, characteristically introduced into the linguistic literature by Horn (2013).

37 The judgement of degradedness is the author's. To the extent that (121a) and (121a) are not perceived as degraded, the argument here is moot as there is nothing to be explained.

(123) As we go marching, marching, unnumbered women dead
go crying through our singing their ancient cry for bread.
Small art and love and beauty their drudging spirits knew.
Yes, **it is bread we fight for — but we fight for roses, too!**

This is certainly a very marked use of language, and what strikes a poet's fancy need not necessarily be a fully acceptable utterance according to the rules of regular conversation. Note, in particular, that the example can be replicated with definite descriptions to the same effect.[38] We therefore take the liberty of not taking this example entirely seriously for the purposes of linguistic theorising.

(124) a. Our goal is bread — but we fight for roses, too!
b. The thing we fight for is bread — but we fight for roses, too!

Similarly, non-exhaustive informative presupposition clefts are to be found as well. (125) can be uttered at the beginning of a story to introduce the fact that Nina visited her uncle and that this visit being talked about happened on Tuesday; it certainly doesn't entail that Tuesday is the only day Nina ever visited my uncle.

(125) It was Tuesday that Nina visited her uncle.

This case, however, can perhaps be explained by some sort of domain restriction: what is important for the conversation is only the events of a relatively narrow time frame and everything outside of that horizon is ignored. More spectacular is a class of examples adduced by Beaver & Onea (2015), which involve a cleft predicate that is not even in principle exhaustifiable.

(126) After all, one of the main characters in the book is Marten and it's his struggle for survival that's one of the main components of the book.

One gains the impression that in this case, the cleft simply picks out as the cleft referent a particularly salient individual from a situation that the speaker is picturing. Importantly, the parallel with definite descriptions is again not broken: odd as it may seem, one finds singular definite descriptions with necessarily non-singleton restrictors.

(127) Jackson Breyer introduced you and said that there is a basic irony that the man who is one of the most influential critics of American drama is an Englishman. (used, not mentioned, in Marino & Bigsby 2011)

Whatever interpretive mechanisms enable these exceptional uses of clefts, they apply to definite descriptions just as well and therefore do no threaten the viability of the referential theory.

38 (124b) does sound somewhat worse to us than (124a), but this is arguably due to the stylistic awkwardness of using the dummy noun *thing* with a relative clause instead of a regular nominal restrictor.

5.5 Interim Summary

In this section, we have shown that the referential approach straightforwardly explains anaphoric uses of clefts and their existential presupposition, which reveal pervasive parallels between clefts and definite descriptions. On the alternative-based view, on the other hand, anaphoricity cannot be adequately captured at all, while the existential presupposition has to be stipulated instead of being derived. In addition, we have suggested an explanation for some of the effects of focus placement in clefts that is compatible with the referential view, and in other instances shown that the same phenomena, though mysterious, occur with definite descriptions as well. This removes a long-standing weakness of the approach.

6 Modified Clefts

Some modifiers which can be added in the copular clause portion of the cleft manipulate their meaning, including the exhaustivity implication, in an interesting way that might shed light on the underlying semantic representation of a cleft. In the following, we discuss two types of cases: The first is clefts modified by *among others*, which are straightforward on the referential view, but pose a problem for the alternative-based approach. The second is clefts with focus-sensitive particles *only* and *also* in the main clause, which pose a challenge to the referential view. We do not ultimately offer an analysis for these sentences, but show that they do not threaten the theory insofar as the puzzles that they raise can be replicated with regular definite descriptions.

6.1 Clefts with *among others*

It is possible to add the adverbial *among others* to the main clause of a cleft, thereby eliminating any trace of exhaustivity with respect to the cleft referent and, in fact, enforcing the opposite.

(128) It was, among others, the students that like Paul.
⇝ Paul was liked by the students and someone else.

What these clefts convey is not that the pivot is identical to the cleft referent, but that the pivot is a proper part of the cleft referent. On the view advanced here, this is not too surprising, since *among others* can be found fulfiling the same function in regular copular sentences as well.[39]

39 Examples of this construction found on the internet are, among others, the following:

(i) a. The heirs were among others his step daughter Margot and his two sons Hans Albert and Eduard.
b. The founders of Helsinki's YMCA were, among others, state councillor Sakari Topelius and theology student [...] Arthur Hjelt.
c. His teachers at the time were, among others, Feliks Rączkowski and Vladislav Oćwieja.

(129) Paul's supporters were, among others, the students.

As far as clefts are concerned, we therefore need say no more than that the predicate *be, among others, the students* is true of any individual that properly contains the students.

(130) $[\![\text{be, among others, the students}]\!] = \lambda x.x \preceq \iota y.students(y)$

Let us now consider what happens when these clefts are viewed through the lense of the alternative-based approach. Presumably, the non-cleft version of such a sentence would have to be (131a) with its focus alternatives (131b).

(131) a. The students, among others, liked Paul.
b. {x, among others, liked the Paul}

There are of course plenty of focus alternatives which are logically stronger than (131a), namely all those in (132).

(132) {The students and x, among others, liked the Paul}

We can consistently negate all these stronger alternatives, and when we conjoin the result with the assertive meaning of (131a), we obtain the rather curious (133), which is not the meaning of (128).

(133) The students and one other person liked Paul.

Velleman et al.'s (2012) theory is, however, formulated not directly in terms of focus alternatives, but in terms of alternative answers to the question being addressed. Presumably, (128) addresses the question of who likes Paul, just as it would without *among others*. The answers to this question are the ones in (134a), whose subset (134b) contains all those that are logically stronger than (131a).

(134) a. {x liked Paul}
b. {The students and x liked Paul}

We cannot negate all of these alternatives in (134b), since that would entail that *only* the students liked Paul and therefore contradict the basic assertive meaning, which entails that someone other than the students also likes Paul.[40] If a pragmatic version of the alternative-based view could be given, this might be a welcome result: Presumably, a pragmatic enrichment that would lead to a contradiction is simply not performed, so that the cleft sentence ends up with its ordinary assertive meaning. If, however, exhaustification is to happen in the semantics, then there is a problem because the cleft should simply be inconsistent, as is the case for the corresponding sentences with *only*.

(135)#Only the students, among others, liked Paul.

40 If instead one negates alternatives based on Fox's (2007) rule of *innocent exclusions*, one again arrives at the prediction that the meaning of the sentence is that the students and one other person liked Paul.

The similarity between clefts and *only* that Velleman et al.'s (2012) particular alternative-based theory posits is therefore broken in this case: The theory correctly predicts the infelicity of (135), but tit is unclear how the fact that clefts like (128) are felicitous and mean what they mean is to be explained.

6.2 Clefts with Focus Sensitive Particles

The focus-sensitive particle *only* can associate with the pivot of a cleft, such as in (136), which of course does not reduce its exhaustivity. Such clefts are essentially synonymous with the corresponding canonical sentences with *only*: They presuppose that the cleft predicate is true of the pivot and assert that it is not true of anybody else.[41] As far as the total information conveyed is concerned, the cleft with *only* is not terribly different from the regular cleft.

(136) It was only Adam that came.
  ⇝ Adam came. (presupposition)
  ⇝ Nobody else came. (assertion)

However, its negation differs starkly from the negation of a regular cleft: Due to the change in assertion and presupposition, (137) is only true if both Adam and somebody else came, a situation in which a regular negated cleft would be undefined.

(137) It wasn't only Adam that came.
  ⇝ Adam came. (presupposition)
  ⇝ Somebody else came as well. (assertion)

It is not clear how this is to be explained on the referential approach. The problem is the presupposition introduced by *only*: **??** should presuppose (138a). But in fact, the truth of (138a) entails the falsity of (137). The actual presupposition we observe is not (138a), but only the weaker (138b), and it is unclear how this comes about.

(138) a. It was Adam who came.
  b. Adam was among those who came.

However, in order to defend the referential approach to clefts against its competitors, it is sufficient to perform another *reductio ad definitum* by showing that copular sentences give rise to the same puzzle, and indeed they do. These exam-

41 This may have first been pointed out by Declerck (1988: 33). There is, however, one difference between the two to be observed: The addition of *only* in a cleft does not overwrite its existence presupposition. Even though *only* adds its own presupposition that the pivot fulfils the cleft predicate, which entails the existence presupposition, the latter can still be shown to be independently present because it is more robust: The *only*-cleft, unlike the otherwise synonymous canonical sentence, cannot be used when the existence of the cleft referent is in doubt.

(i) a. Does anybody like snakes?
  b. Only John.
  c. #It's only John.

ples, such as (139), necessarily involve multiple individuals due to the presence of number morphology.[42] Whatever the explanation for such cases, it will also apply to clefts.

(139) The guests were (not) only Adam and Miles.
⇝ Adam and Miles were among the guests. (presupposition)
⇝ There were (no) other guests. (assertion)

It is usually assumed that the additive particle *also* cannot associate with the pivot of a cleft, since its additive semantics is in direct contradiction with the exhaustivity of the cleft (Horn 1969, Percus 1997).[43] However, É. Kiss (1998) points out that in certain exceptional circumstances, such examples do seem to be possible.

(140) A: Bill danced with Mary.
B: No, it was Sam that danced with Mary.
C: It was also John that danced with her.

While C's utterance still has a mild oddness to it in our mind, it must be admitted that it is far from outright contradictory. Compare this, however, to (141), which seems to have the same character.

(141) Mary was courted by Bill and Sam, but her suitors were also John and Fred.

Hedberg (2013) points out an attested cleft which does not contain *also*, but could.[44]

(142) It's not just imagination, it's [also] the character of men and the actions of men that I'm interested in.

42 A Google search yielded numerous examples of this kind, among them the following:

(i) a. You can come as infrequently as you want, so long as the weeks that you come aren't only the weeks that you have submitted.
b. What makes it even scarier is that the monsters aren't only the two thugs[.]
c. The "leaves" of this tree aren't only the leaf nodes of the original graph; they include all the nodes, as desired.

43 This is to be distinguished from a rather more frequent variety discussed by Hedberg (2013) in which *also* associates not with the pivot, but with the cleft predicate:

(i) A: Why do you think that John is the murderer?
B: It was John who had the motive. It was John who had the opportunity. It was also John who found the body.

44 Our impression is that in the absence of *also*, *just* in the first clause must be understood as scalar rather than exclusive: The thing the speaker is interested is not something that is no higher on the scale as *imagination*. This means that imagination is actually not among the things the speaker is interested in, because he or she is interested in things higher on the scale, namely the character and actions of men. The cleft is then duly exhaustive. We find this reading slightly forced, perhaps because the required scale is difficult to accommodate, so that we actually prefer the sentence with added *also*.

With abstract nouns such as *interest*, *hope*, and *goal*, analogous examples with definite descriptions are easy to find and equally natural:

(143) Aside from motivational speaking my interests are also the things I describe here in my page and lots of other things.

(144) [T]he hope is that the project will also benefit arable and dairy farmers. [...] The hope is also that it will be possible to launch a number of new products that can be sold on the basis of their climate-friendliness[.]

(145) [T]he goal is to integrate these experiences and lessons [...]. The goal is also to provide effective illustrations as to how the Compstat management paradigm addresses these issues [...].

Again, it would seem that the *reductio ad definitum* is successful, although it is, of course, quite mysterious how such sentences can exist at all.

7 Experimentalia

A number of recent experimental investigations of clefts have been undertaken in an effort to elucidate the status of the exhaustivity implication, revealing that subjects find clefts surprisingly acceptable even when exhaustivity is violated. In this section, we will review these studies with a view to how they can inform the theory of clefts. It will turn out that the findings are, by and large, equally explicable on all theories. This is not entirely surprising as the studies in question were mostly not designed to specifically test a differential prediction of the theories that we have discussed.

7.1 Destruel et al. 2015

Destruel et al. (2015) presented subjects with a spoken mini-discourse consisting of a question and an answer. The question was always the same, while the answer could be either a cleft, a sentence with *only*, or a sentence with narrow answer focus.

(146) A: What did Philip buy his sister?
B: (i) Philip only bought his sister a necklace.
(ii) Philip bought his sister a NECKLACE.
(iii) It was a necklace that Philip bought his sister.

Participants were then asked to choose between three continuations, all of which denied the exhaustivity of the answer.

(147) a. Yes, and Philip also bought his sister a bracelet.
b. Yes, but Philip also bought his sister a bracelet.
c. No, Philip also bought his sister a bracelet.

Only-sentences were overwhelmingly met with a *no* answer, since they assert exhaustivity and so are simply false when it fails. Responses to canonical

sentences with narrow focus were essentially evenly split between *yes, and* and *yes, but*. The same split was observed for clefts, but with a (statistically significant) preponderance of *yes, but*.

There is a natural interpretation of these results in terms of the presuppositional alternative-based theory of clefts, which is what the authors themselves suggest. Exhaustivity is a separate meaning component distinct from, and logically independent of, the regular assertive content of the cleft.[45] This assertive content is, of course, true in the given scenarios, which is presumably what justifies the answer *yes*. The continuation *but* may be preferred to indicate that there is still some meaning component that is not true. On the whole, a preference for *yes, but* is to be seen as diagnostic of a sentence with a true at-issue meaning and a logically independent false non-at-issue meaning. The prediction is that other sentences which have presuppositions that are logically independent from their assertion, such as those with *too* and *again*, should behave similarly.

(148) Nina invited Adam, too.

Nina invited Adam.	(assertion)
Nina invited somebody else.	(presupposition)

(149) Nina invited Adam again.

Nina invited Adam.	(assertion)
Nina had previously invited Adam.	(presupposition)

Indeed, Xue & Onea (2011) find that *yes, but*-responses are accepted at quite high rates in such cases (51% and 71%, respectively). Comparable results were found by Cummins et al. 2013 for *yes, although*-responses.

(150) A: Nina invited Adam, too.
B: Yes, but /although she didn't invite anybody else.

(151) A: Nina invited Adam again.
B: Yes, but / although she hadn't invited Adam before.

Unfortunately, we are not aware of any data about the presupposition of *only*, which would be the most relevant comparison for Velleman et al.'s (2012) particular theory.[46]

In principle, a story similar to the above could be told on the pragmatic version of the alternative-based approach. Here, too, there are two separable meaning components, the literal meaning and the enrichment, i.e. the negations

45 Logical independence of p and q, in this case, is to be understood as a lack of entailment in either direction, i.e. neither does p entail q nor does q entail p. This does not mean that all combinatorially possible truth value assignments to p and q are admissible; for example, $\neg p$ may still entail q. Concretely, on the approach under discussion, the negation of the assertion of a cleft entails its presupposition.

46 As a reviewer points out, however, B's continuation below is very odd, which would go against the prediction of that version of the presuppositional theory.

(i) A: Only John left.
B: #Yes, but John didn't leave.

of the alternatives. Again, the continuation *yes, but* could be the preferred choice in a situation where the literal meaning is true and the enrichment is false. This view would *prima facie* predict no difference between clefts and the corresponding canonical sentences with narrow focus, since those, too, have a true literal meaning and a false enriched meaning in the same situations. This, however, only leads back to the old problem that the pragmatic approach has no clear means of explaining the greater robustness of exhaustivity in clefts than in canonical sentences, which is independently obvious from the intuitive judgements discussed in section 2.1. If this can be solved in some way, one would assume that the solution would also account for the different absolute rates of *yes, but* responses (keeping in mind that *yes, but* is, in fact, chosen about half of the time even with canonical sentences).

Destruel et al. (2015) also attempt a comparison with a different kind of quantity implicatures, namely scalar implicatures. However, the informativity of these results is doubtful, as the experimental items looked quite different:

(152) A: The soup is warm.
B: (i) Yes, and the soup is hot.
(ii) Yes, but the soup is hot.
(iii) No, the soup is hot.

Subjects uniformly chose the answer *no*. Importantly, however, the answer options here are not at all analogous to those for clefts. In particular, the exhaustivity-denying sentence in (152) entails the literal meaning of A's utterance. The analogous answer options for clefts would therefore be those in (153). Among these, we find ourselves strongly preferring *no* and suspect that experimental subjects would share our sentiment.

(153) a. Yes, and Philip bought his sister a necklace and a bracelet.
b. Yes, but Philip bought his sister a necklace and a bracelet.
c. No, Philip bought his sister a necklace and a bracelet.

Both versions of the alternative-based approach to clefts thus appear quite readily equipped to deal with the experimental results found by Destruel et al. What, then, about the trivalent referential approach that we have been advocated?

On our approach, the exhaustivity implication is, as it were, baked together with the rest of the meaning; the question of its truth value as a separable meaning component does not arise. Thus, the conceptualisation of the experimental findings cannot be analogous to what we have just seen for the alternative-based theories, since there is no separate true meaning component for *yes* to target.

The natural first question to ask is, of course, whether definite descriptions behave in a way comparable to clefts on Destruel et al.'s task, as the referential approach would predict. There is no immediate definite description version of the necklace example due to the import of number morphology: Unlike the sentences in (146), (154) has a uniqueness presupposition, and it suffers from the additional stylistic awkwardness of employing the dummy restrictor noun *thing*.

(154) The thing that Philipp gave her was a necklace.

Nonetheless, we find introspectively that, if given a forced choice between the three answer options in (147), we would prefer one of the *yes* options, and quite possibly *yes, but*. We suspect that what is behind these judgements is a rescue strategy where we first evaluate the sentence with respect to a restricted situation. If Philipp gave his sister two things, then we can choose to think only of one of the two givings and evaluate the sentence with respect to that. Then we can, following up with *but*, point out that once we take into account a larger situation, there was another giving. This would also explain how the violation of the uniqueness assumption that (154) incurs with respect to the larger situation would be dealt with so that the sentence can nonetheless receive a *yes*-answer. The same rescue mechanism could apply in the case of clefts.[47]

It is clear that the results of Destruel et al.'s (2015) experiments are not actually *predicted* by any theoretical approach — although the presuppositional theory probably comes closest to doing so. However, they are *interpretable* on all accounts, and they do no test any differential prediction of one theory or the other. Consequently, their evidential import, in relation to theory, is rather weak. This is not to say that the experimental paradigm is fundamentally faulty; it is merely the restricted choice of materials that prevents these results from having a more impactful interpretation in theoretical terms. A follow-up experiment that performs the right comparisons may well be able to uncover an inadequacy in one theory or the other, or, on the contrary, confirm its predictions.

7.2 Byram Washburn et al. to appear

Another experiment in which clefts that incurred an exhaustivity violation were found to be acceptable to a degree that one might consider surprising was conducted by Byram Washburn et al. to appear. They asked subjects to rate the naturalness of a cleft-sentence given a certain prior discourse. An example of a non-exhaustive cleft and its context is given in (155).

(155) Jane and Tom painted furniture. Tom painted a chair, a desk, and a table. Later, Kevin remarks: "I bet Tom painted only lamps again, didn't he?" Jane responds: "He doesn't always paint lamps. **Yesterday, it was a chair that he painted.**"

While there is a tendency in the data in the direction of non-exhaustive clefts being slightly worse than exhaustive clefts, the difference was not even found to be statistically significant. Nevertheless, we do not take this to be much of an indication that exhaustivity is merely a suspendable pragmatic inference, as the authors suggest, since the results are quite easily explained in a different way: The vignette does not make unambiguously clear that all of the painting necessarily happened yesterday, so the hearer may easily assume that exhaustivity is satisfied with respect to yesterday, so that the putative examples of non-exhaustive clefts are not non-exhaustive at all. Furthermore, even if the assumption that all the

47 This mechanism could also be what allows us to even interpret (123) and following in section 5.4 above.

painting happened yesterday were to be granted, it still seems to us quite natural to interpret a sentence introduced by *yesterday* as not being about the whole day, but rather about just being one particular situation some time yesterday that the speaker is picturing. In that situation, the chair may well have been the only thing that was painted, with no implication that it was the only thing that was painted in the course of the whole day. Therefore, since the experimental items fails to ensure that a violation of exhaustivity is, in fact, present, we cannot conclude much from the results.

7.3 Van Tiel & Schaeken (to appear)

In another study, van Tiel & Schaeken (to appear) compared a number of phenomena that have been argued to involve quantity implicatures: scalar implicatures (*some* $\rightsquigarrow$ *not all*), free choice effects with disjunction, conditional perfection, and exhaustivity in clefts. All of these were tested on a binary truth-value judgement task with answer options *yes* and *no*.

Subjects accepted non-exhaustive clefts at the strikingly high rate of 54% and accepted literally true sentences with a false scalar implicature at a comparable rate. However, clefts and sentences with scalar implicatures differed quite starkly in how the answer given interacted with response time. Acceptance judgements of scalar implicature sentences were equally fast no matter whether the scalar implicature was true. Rejection judgements, however, were slower when the sentence was literally true and had a false implicature compared to when it was literally false. Clefts behaved quite differently: Acceptance of non-exhaustive clefts was slower than acceptance of unambiguously true clefts, but rejection of non-exhaustive clefts was equally fast as rejection of unambiguously false clefts.

van Tiel & Schaeken suggest an explanation as follows. In cleft sentences, the quantity implicature is computed by default and suspending it takes additional time. While this implicature can be described in terms of abstract alternatives, it does not, in fact, involve the consideration of concrete alternative expressions. Scalar implicatures, on the other hand, are associated with a processing cost because, unlike exhaustivity, they require the computation of alternatives by replacing constituents in the sentences with items from the lexicon: the scalemates of the scalar item. This slows down the overall processing. Rejections based on a false literal meaning are very fast because in this type of situation, the scalar implicatures cannot possibly influence the judgement and so there is a shortcut.

The presuppositional alternative-based theorist can avail himself of essentially the same argument to explain the behaviour of clefts in this experiment: Suspending the presupposition in order to judge the sentence true takes additional time. There is, of course, a question of how the presupposition, a part of the conventional meaning, can just be ignored. However, the supposed presupposition of clefts is fully logically independent from their assertion, so that it is at least in principle possible that subjects sometimes take the *yes* or *no* answer to apply only to the assertive meaning component — a possibility whose existence is suggested by experimental investigations of presupposition (Cummins et al. 2013, Jayez et al. 2015).

From the point of view of the referential theory of clefts, the descriptive result is that undefined clefts are sometimes accepted, but that accepting them takes longer than accepting a true cleft. This is, in fact, perfectly in line with what was found for definite descriptions by Schwarz (2013): His subjects accepted sentences with definite descriptions that were undefined due to a homogeneity violation at a rate of around 30%, and when they did, response times were higher than for the acceptance of plainly true sentences.

van Tiel & Schaeken's (to appear) experiment was not primarily designed to test theories of clefts, and so it lacks the comparison with other phenomena (exhaustivity with narrow focus, non-entailed presuppositions, and homogeneity) that would be relevant for this purpose. Since the existing data on clefts themselves are readily interpretable on all theories, we conclude that they do not constitute evidence one way or the other.

7.4 DeVeaugh-Geiss et al. 2015

DeVeaugh-Geiss et al. (2015) compared cleft sentences and sentences with *only* with respect to an acceptability judgement task that specifically tested Velleman et al.'s (2012) theory of clefts: They presented subjects with contradictory sentences, where the second part of the sentence contradicted either the supposed presupposition of the first, or the assertive component. The experiment was performed in German, but we see no reason to believe that clefts in the two languages differ semantically.

(156) ***only*, contradiction with assertion**
Only Sabine visited the zoo, and Anna visited the zoo.

(157) ***only*, contradiction with presupposition**
Only Sabine visited the zoo, and she didn't visit the zoo.

(158) **cleft, contradiction with assertion**
It is Sabine who visited the zoo, and she didn't visit the zoo.

(159) **cleft, contradiction with presupposition**
It is Sabine who visited the zoo, and Anna visited the zoo.

It was found that with clefts, contradiction with the (supposed) presupposition was more acceptable than contradiction with the assertion. The reverse was true for *only*: here, a contradiction with the presupposition was rated as less acceptable than a contradiction with the assertion. The authors point out that this indicates that exhaustivity in clefts does not have the same status as the presupposition of *only*, contrary to Velleman et al.'s (2012) prediction.

In a second experiment, an analogous comparison was performed between sentences with *only* and those with definite descriptions. In the latter case, the contradiction was with the uniqueness presupposition of a singular definite description.

(160) **definite description, contradiction with assertion**
The one who visited the zoo is Sabine, and she didn't visit the zoo.

(161) **definite description, contradiction with uniqueness presupposition**
The one who visited the zoo is Sabine, and Anna visited the zoo, too.

Subjects judged (161) as about equally unacceptable as (160), indicating that at least on this measure, the existence presupposition of a definite description is comparable to the presupposition of *only*. It is not clear to us what the experimenters' motivation may have been for comparing definite descriptions to *only*, rather than directly to clefts, but by indirect comparison, we can infer that the uniqueness presupposition of definite descriptions differs from the exhaustivity implication of clefts. This, however, is of very limited theoretical relevance, as no theory predicts specifically that exhaustivity in clefts should behave like the uniqueness presupposition of definite descriptions.[48] A more informative comparison would have been that between non-exhaustive clefts and sentences with definite descriptions that are undefined due to a homogeneity violation.

7.5 Interim Summary

While clefts have featured in a number of recent experimental investigations with sometimes unexpected results, we have argued that those are not altogether inexplicable on (the best versions of) any of the theoretical approaches. Most of these studies did not specifically target differential predictions of the theoretical variants, and we maintain that the evidence they provide, if any, is certainly of lesser import than the considerations put forward in the theoretical literature. An exception to this is the study by DeVeaugh-Geiss et al. (2015), which does, in fact, test a prediction more or less particular to Velleman et al.'s (2012) presuppositional alternative-based theory, and provides some evidence against it, showing that subjects treat a violation of the presupposition of *only* differently from a non-exhaustive cleft.

8 Conclusion

In this paper, we have defended a theory of clefts as referential constructions, according to which, semantically, the cleft predicate is turned into a definite description and its referent is then identified as the pivot, so that (162a) is semantically equivalent to (162b).

(162) a. It was Adam and Miles that Nina invited.
b. The people who Nina invited were Adam and Miles.

48 To be sure, Büring & Križ (2013) call both a *presupposition*, and to that extent do not differentiate between them. However, it is known that differences arise even within the class of presuppositions, and the conceptualisation of homogeneity as a presupposition is mistaken for independent reasons (cf. section 4). Thus, while the result might refute a narrow interpretation of Büring & Križ's implementation of their idea, it does not shed light on the homogeneity-based referential theory of clefts *per se* once it is viewed in a more sophisticated manner.

This allows the conceptualisation of exhaustivity violations in clefts as violations of the homogeneity of plural predication, which causes the sentence to be neither true nor false in certain situations. Since negation requires falsity, it is explained why an exhaustivity violation is not sufficient to render the negation of a cleft sentence true. This idea was put forth by Büring & Križ (2013), and we consider our implementation to be an update on theirs (sections 3 and 4).

This approach explains the pervasive parallels between cleft sentences and copular sentences with definite descriptions, such as the presence of an existential presupposition and the existence of anaphoric readings (section 5). The behaviour of definite descriptions is often quite puzzling and mysterious on its own, and we do not purport to explain all of it. What is crucial for our case is that the challenge posed by clefts can be reduced to that of definite descriptions. Notably, we discuss the effect of focus placement on the interpretation of cleft sentences, which has previously received little attention from theorists attempting to link clefts and definite descriptions, and has generally been taken as problem for this approach. It turns out that, to the extent that they are inexplicable, these effects can be found with definite descriptions as well. This removes an important source of doubt as to the tenability of a referential semantics for clefts.

The alternative approach, which assumes that that clefts are underlyingly non-referential and synonymous with the corresponding non-cleft sentence, but exhaustified through the negation of focus alternatives, faces several objections based on these facts. Such theories cannot predict an existence presupposition, but have to stipulate it; they cannot fully for anaphoric uses of clefts; and to the extent that they analyse clefts as focus-sensitive constructions (Velleman et al. 2012), they are challenged by the fact that clefts do not actually pass the diagnostics for semantic focus sensitivity.

Clefts modified by *among others*, while unexceptional on the referential view, provide another argument against at least the more well-developed semantic varieties of the alternative-based approach (Velleman et al. 2012). Additionally, clefts can be modified with focus-sensitive particles (*only*, *also*), which is puzzling on the referential view, but turns out to be the case for regular copular sentences with definite descriptions as well, the predicted parallel with which is thus maintained (section 6).

We ended with a discussion of how recent experimental results are compatible with the theoretical view we advocate, although they do not specifically favour it over alternative explanations (section 7).

Questions for further research remain in abundance: The varieties of definite descriptions that we uncovered in tracing their parallel with clefts are often mysterious in their own right, including such things as non-maximal definite descriptions with semantically inexhaustifiable predicates and definite descriptions whose presupposition is weakened by a focus inside them. A better understanding of these would be desirable. When it comes to clefts, we have restricted our attention to those where the cleft predicate is a predicate of individuals (and the pivot consequently a noun phrase). It remains to be explored how the theory fares once one attempts to extend it to clefts with respect to other domains, such as time, place, and manner.

References

Akmajian, Adrian. 1970. On deriving cleft sentences from pseudo-cleft sentences. *Linguistic Inquiry* 1(2). pp. 149–168.

Ball, Catherine & Ellen Prince. 1977. A note on stress and presupposition. *Linguistic Inquiry* 8(3). 585.

Beaver, David & Brady Clark. 2008. *Sense and sensitivity: How focus determines meaning*. Wiley-Blackwell.

Beaver, David & Edgar Onea. 2015. Cleftomania. Presentation at the Questions in Pragmatics Workshop, Amsterdam.

Breheny, Richard. 2005. Exhaustivity, homogeneity, and definiteness. In Paul Dekker & Michael Franke (eds.), *Proceedings of the fifth Amsterdam Colloquium*, 59–65.

Büring, Daniel. 2006. Focus projection and default prominence. In Valéria Molnár & Susanne Winkler (eds.), *The architecture of focus*, 321–346. Mouton de Gruyter.

Büring, Daniel. to appear. (contrastive) topic. In Caroline Féry & Shinchiro Ishihara (eds.), *The handbook of information structure*, Oxford: Oxford University Press.

Büring, Daniel & Manuel Križ. 2013. It's that and that's it! Exhaustivity and homogeneity presuppositions in clefts (and definites). *Semantics & Pragmatics* 6.

Byram Washburn, Mary, Elsi Kaiser & Maria Luisa Zubizarreta. to appear. The English it-cleft: No need to get exhausted. In Malte Zimmermann, Edgar Onea & Klaus von Heusinger (eds.), *Questions in discourse*, Brill.

Carlson, Lauri. 1983. *Dialogue games: An approach to discourse analysis*. Dordrecht: Reidel.

Champollion, Lucas. 2010. *Parts of a whole: Distributivity as a bridge between aspect and measurement*: University of Pennsylvania dissertation.

Coppock, Elizabeth & David Beaver. 2015. Definiteness and determinacy. *Linguistics & Philosophy* 38(5). 377–435.

Cummins, Chris, Patrícia Amaral & Napoleon Katsos. 2013. Backgrounding and accommodation of presuppositions: An experimental approach. In Emmanuel Chemla, Vincent Homer & Grégoire Winterstein (eds.), *Proceedings of Sinn und Bedeutung 17*, 201–218. Paris: ENS.

Declerck, Renaat. 1988. *Studies on copular sentences, clefts and pseudoclefts*. Leuven: Leuven University Press.

Delin, Judy. 1992. Properties of *it*-cleft presuppositions. *Journal of Semantics* 9. 179–196.

Destruel, Emilie, Daniel Velleman, Edgar Onea, Dylan Bumford, Jingyang Xue & David Beaver. 2015. A cross-linguistic study of the non-at-issueness of exhaustive inferences. In Florian Schwarz (ed.), *Experimental perspectives on presuppositions*, vol. 45 Studies in Theoretical Psycholinguistics, 135–156. Springer.

DeVeaugh-Geiss, Joseph, Edgar Onea, Malte Zimmermann & Anna-Christina Boell. 2015. Contradicting (not)-at-issueness in exclusives and clefts: An empirical study. In *Proceedings of SALT 25*, .

Dufter, Andreas. 2009. Clefting and discourse organization: Comparing Germanic and Romance. In Andreas Dufter & Daniel Jacob (eds.), *Focus and background in Romance languages*, 88–121. Amsterdam: John Benjamins.

É. Kiss, Katalin. 1998. Identificational focus and information focus. *Language* 74. 245–273. doi:10.2307/417867.

Elbourne, Paul. 2005. *Situations and individuals*. Cambridge, MA: MIT Press.

Fox, Danny. 2007. Free choice and the theory of scalar implicatures. Ms. MIT.

Gajewski, Jon. 2005. *Neg-raising: Polarity and Presupposition*: MIT dissertation.

Halvorsen, Per-Kristian. 1978. *The Syntax and Semantics of Cleft Constructions*: University of Texas, Austin dissertation.

Harries-Delisle, Helga. 1978. Contrastive Emphasis and Cleft Sentences. In Joseph H. Greenberg (ed.), *Universals of human language: Syntax*, 419–486. Stanford: Stanford University Press.

Hedberg, Nancy. 2000. The Referential Status of Clefts. *Language* 76. 891–920. doi:10.2307/417203.

Hedberg, Nancy. 2013. Multiple focus and cleft sentences. In Katharina Hartmann & Tonjes Veenstra (eds.), *Cleft structures*, John Benjamins.

Heim, Irene. 1982. *The semantics of definite and indefinite noun phrases*: University of Massachusetts, Amherst dissertation.

Heim, Irene & Angelika Kratzer. 1998. *Semantics in generative grammar*. Blackwell.

Horn, Laurence. 1969. A presuppositional analysis of *only and* even. In *Papers from the 5th regional meeting of the Chicago Linguistic Society*, 98–107.

Horn, Laurence. 1981. Exhaustiveness and the semantics of clefts. In Victoria Burke & James Pustejovsky (eds.), *Proceeding of NELS 11*, 125–142. Amherst: University of Massachusetts.

Horn, Laurence. 2013. Exhaustivity and focus revisited. Talk at the 35th Annual Conference of the German Linguistic Society (DGfS). Potsdam, Germany.

Horn, Laurence. 2014. Information structure and the landscape of (non-)at-issue meaning. In Caroline Féry & Shinchiro Ishihara (eds.), *The oxford handbook of information structure*, 108–127. Oxford University Press.

Jayez, Jacques, Valeria Mongelli, Anne Reboul & Jean-Baptiste van der Henst. 2015. Weak and strong triggers. In Florian Schwarz (ed.), *Experimental perspectives on presuppositions*, 173–193. Springer.

Krifka, Manfred. 1992. A compositional semantics for multiple focus constructions. In *Proceedings of SALT 1* Cornell Working Papers in Linguistics, 127–158.

Krifka, Manfred. 2007. Basic notions of information structure. In Caroline Féry & Manfred Krifka (eds.), *Interdisciplinary studies of information structure 6*, 13–56. Potsdam: Universitätsverlag.

Križ, Manuel. 2015a. *Aspects of homogeneity in the semantics of natural language*: University of Vienna dissertation.

Križ, Manuel. 2015b. Homogeneity, non-maximality, and 'all'. *Journal of Semantics* doi:10.1093/jos/ffv006.

Križ, Manuel. 2016. Homogeneity, non-maximality, and 'all'. *Journal of Semantics* 33(3). 493–539. doi:10.1093/jos/ffv006.

Križ, Manuel & Emmanuel Chemla. 2015. Two methods to find truth-value gaps and their application to the projection problem of homogeneity. *Natural Language Semantics* doi:10.1007/s11050-015-9114-z.

Link, Godehard. 1983. The logical analysis of plurals and mass terms: A lattice-theoretical approach. In R. Baeuerle, C. Schwarze & Arnim von Stechow (eds.), *Meaning, use and interpretation of language*, de Gruyter.

Löbner, Sebastian. 1987. The Conceptual Nature of Natural Language Quantification. In I. Rusza & Anna Szabolcsi (eds.), *Proceedings of the '87 Debrecen symposion on logic and language*, Budapest: Akadémiai Kiadó.

Löbner, Sebastian. 2000. Polarity in natural language: predication, quantification and negation in particular and characterizing sentences. *Linguistics and Philosophy* 23. 213–308.

Magri, Giorgio. 2014. An account for the homogeneity effects triggered by plural definites and conjunction based on double strengthening. In Salvatore Pistoia Reda (ed.), *Pragmatics, semantics and the case of scalar implicatures* Palgrave Studies in Pragmatics, Language and Cognition, 99–145. Houndsmills: Palgrave Macmillan.

Marino, Stephen & Christopher Bigsby. 2011. A conversation with Christopher Bigsby. *The Arthur Miller Journal* 6(1). 1–16.

Percus, Orin. 1997. Prying open the cleft. In Kiyomi Kusumoto (ed.), *Proceedings of NELS 27*, 337–351.

Pollard, Carl & Murat Yasavul. in press. Anaphoric it-clefts: The myth of exhaustivity. In *Proceedings of Chicago Linguistic Society (CLS) 50*, .

Prince, Ellen. 1978. A comparison of *wh*-clefts and *it*-clefts in discourse. *Language* 883–906.

Rooth, Mats. 1999. Association with focus or association with presupposition. In Peter Bosch & Rob Van Der Sandt (eds.), *Focus – linguistic, cognitive, and computational perspectives*, 232–244. Cambridge University Press.

Schwarz, Florian. 2009. *Two types of definites in natural language*: University of Massachusetts, Amherst dissertation.

Schwarz, Florian. 2013. Maximality and definite plurals – experimental evidence. In Emmanuel Chemla, Vincent Homer & Grégoire Winterstein (eds.), *Proceedings of Sinn und Bedeutung 17*, 527–544.

Schwarzschild, Roger. 1994. Plurals, presuppositions and the sources of distributivity. *Natural Language Semantics* 2(3). 201–248.

Schwarzschild, Roger. 1996. *Pluralities*. Dordrecht ; Boston: Kluwer Academic.

Spector, Benjamin. 2012. Plurals, homogeneity, and vagueness. Presented at the Workshop on Semantics, Vienna.

Szabolcsi, Anna & Bill Haddican. 2004. Conjunction meets negation: A study in cross-linguistic variation. *Journal of Semantics* 21(3). 219–249.

van Tiel, Bob, Emiel van Miltenburg, Natalia Zevakhina & Bart Geurts. 2016. Scalar diversity. *Journal of Semantics* 33(1). 107–135.

van Tiel, Bob & Walter Schaeken. to appear. Processing conversational implicatures: Alternatives and counterfactual reasoning. *Cognitive Science* .

Velleman, Dan Bridges, David Beaver, Emilie Destruel, Dylan Bumford, Edgar Onea & Liz Coppock. 2012. It-clefts are IT (inquiry terminating) constructions. In Anca Chereches (ed.), *Proceedings of SALT 22*, 441–460.

Xue, Jingyang & Edgar Onea. 2011. Correlation between presupposition projection and at-issueness: An empirical study. In *Proceedings of the ESSLLI 2011 workshop on projective meaning*, 171–184. Ljubljana, Slovenia.