Experimental Studies on *it*-Clefts and Predicate Interpretation[*]

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Abstract There is an ongoing discussion in the literature whether the series of sentences '*It's not α that did P. α and β did P.*' is acceptable or not. Whereas the *homogeneity approach* in Büring & Križ 2013, Križ 2016, and Križ 2017 predicts these sentences to be unacceptable, the *alternative-based approach* predicts acceptability depending on the predicate being interpreted distributively or non-distributively (among others, Horn 1981, Velleman et al. 2012, Renans 2016a,b). We report on three experiments testing the predictions of both types of approaches. These studies provide empirical data that not only bears on these approaches, but also allows us to distinguish between different accounts of cleft exhaustivity that might otherwise make the same predictions. The results of the three studies reported here suggest that the acceptability of clefts depends on the interpretation of the predicate, thereby posing a serious challenge to the homogeneity approach, and contributing to the ongoing discussion on the semantics of *it*-clefts.

1 Introduction

It has been observed in the literature that focus-background *it*-clefts of the form '*It's α that did P.*' give rise to an exhaustive inference that α in the cleft pivot is

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the only entity for which the predicate *P* holds (Horn 1981, Percus 1997, Velleman et al. 2012, Büring & Križ 2013, Destruel et al. 2015, Renans 2016a,b, Križ 2017, De Veaugh-Geiss et al. 2018, among many others). For the sake of example, consider the sentence in (1).

(1)   It was Kimberly who did the dishes.
         ⤳ *Kimberly and nobody else did the dishes.*   (exhaustive inference)

There is, however, an ongoing debate as to whether the series of sentences as in (2) is acceptable.

(2)   It wasn't Kimberly who did the dishes. Kimberly and Helen did the dishes.

In particular, the *homogeneity approach* in Büring & Križ 2013, Križ 2016, and Križ 2017 predicts (2) to be invariably unacceptable.[1] By contrast, Velleman et al. (2012) and Renans (2016a,b) observe that the acceptability of (2) will differ depending on the interpretation of the predicate being either distributive or non-distributive; moreover, several other approaches to cleft exhaustivity are compatible with the (un)acceptability of (2) being influenced by the distributive/non-distributive interpretation of the predicate (Horn 1981, Destruel et al. 2015, De Veaugh-Geiss et al. 2018). Despite their differences, we will lump these non-homogeneity accounts into one group which we call, following Križ (2017), the *alternative-based approach*.

As Velleman et al. (2012: p. 455) remark, however: "we must admit that these are subtle intuitions, and further empirical evidence here would be helpful". Therefore, the clarification of the (un)acceptability of (2) is urgent not only for empirical reasons, but more importantly, it provides a new empirical landscape allowing one to distinguish between different approaches to cleft exhaustivity which might otherwise make the same predictions.

The goals of the three studies presented here are twofold: we aim at (i) clarifying the empirical generalizations, and (ii) experimentally testing the theoretical predictions of clefts with distributively and non-distributively interpreted predicates. Results reveal that the distributive vs. non-distributive interpretation of the predicate does indeed influence judgments of acceptability for the series of sentences as in (2): specifically, sentences with distributively interpreted predicates were judged as less acceptable than sentences with non-distributively interpreted predicates, and this effect was robust and replicated across three different experiments. The results reported here are thus consistent with the alternative-based approach to cleft exhaustivity, while posing a direct challenge to the homogeneity approach.

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1 Büring & Križ (2013: Fn. 1) and Križ (2017: Fn. 1), following Horn (1981, 1985, 1989), acknowledge that it may be possible for (2) to be acceptable if the negation in the first sentence is metalinguistic negation. We come back to this issue in Section 4.

The outline of this paper is as follows: In Section 2 we present the theoretical background to both the homogeneity approach and the alternative-based approach, in particular Velleman et al. 2012, along with the predictions of each. In Section 3, we present three experiments designed to test these predictions, one with written stimuli and two with auditory stimuli. In Section 4, we address the role of negation — in particular, metalinguistic negation — for the reported experiments. Section 5 concludes.

2 Theoretical background

2.1 Predicate types (distributive, collective, and mixed)

We begin by spelling out the theoretical assumptions regarding distributive and other predicate types, namely, collective and mixed predicates. Following Landman 1989, we assume that distributive predicate types predicate of the atomic individuals that constitute the plurality: that is, they have atomic entities in their denotation. For example, upon hearing (3a), one can conclude that Alice laughed, shown in (3b).[2]

(3)   *Distributive Predicate*
        a.   Alice and Bob laughed. ⤳ *Alice laughed and Bob laughed.*
        b. $laughed(a \oplus b) \vDash laughed(a)$ (distributive interpretation)

By contrast, collective predicate types predicate of pluralities only: that is, they only have plural individuals in their denotation. This means that the predicate is not true of each atomic entity. For that reason, given that Carol and Dan gathered, as in (4a), it is not true that Carol gathered, shown in (4b).

(4)   *Collective Predicate*
        a.   Carol and Dan gathered.
        b. $gathered(c \oplus d) \nvDash gathered(c)$ (non-distributive interpretation)

Finally, in addition to distributive and collective predicates, there are mixed predicate types such as *do the dishes* in example (5) below. These are referred to as 'mixed' since the interpretation of the predicate depends on the context in which the predicate appears. For example, while in the context of (5a) *do the dishes* is interpreted distributively, in (5b) it is interpreted non-distributively.

(5)   a.   *Distributive Interpretation*
              Helen and Kimberly live together. On Saturday Kimberly did the dishes and yesterday Helen did the dishes.

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2 See Champollion (to appear) for an overview and discussion on distributivity vs. collectivity.

(i) Kimberly and Helen did the dishes. ⇝ *Kimberly did the dishes and Helen did the dishes*

(ii) *did_the_dishes*$(a \oplus b) \models did\_the\_dishes(a)$

b. *Non-Distributive Interpretation*

Helen and Kimberly live together. Yesterday Helen cooked, but they did the dishes together.

(i) Kimberly and Helen did the dishes.

(ii) *did_the_dishes*$(a \oplus b) \nvDash did\_the\_dishes(a)$

[Experiment 3, Item 12]

There is an ongoing discussion whether such mixed predicates should be analyzed as being underspecified (Kratzer 2008, Schwarzschild 1993, Moltman 1997) or ambiguous (Heim 1994, Moltman 2005, Frazier et al. 1999). In our study, we manipulated the context such that only one interpretation of the predicate — either the distributive or a non-distributive — was pragmatically plausible. Since the interpretation was controlled for by the context, we stay neutral in the debate as to whether mixed predicates are underspecified or ambiguous.

Before we go into the details of our three experiments, let us first discuss two competing approaches to exhaustivity in clefts: the homogeneity approach and the alternative-based approach.

2.2 Homogeneity approach

Under the homogeneity approach, *it*-clefts semantically correspond to copular sentences with the cleft predicate turned into a (number-neutral) definite description: they are identity statements between two individuals (Büring & Križ 2013, Križ 2017).[3] The core idea is that the violation of the exhaustivity inference results in the cleft sentence — as well as its negated version — being neither true nor false; that is, there is a truth-value gap. This trivalent property of the predicate is called homogeneity. For example, the sentence in (6) is argued to give rise to the following truth-conditions.

(6) It was Kimberly who did the dishes.

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3 While there are in fact differences between the accounts in Büring & Križ 2013 and Križ 2017, they do not influence the predictions for our studies. One difference to note is that under Križ's (2017) formulation, unlike in Büring & Križ's (2013) account, homogeneity in clefts is not a presupposition and it is not triggered by the definite article but by the predicate. However, as Križ (2017: p. 25) writes: "In terms of actual empirical predictions about clefts in particular, [Büring & Križ'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 [Büring & Križ 2013] […]".

> **true**   iff Kimberly is identical to the mereological sum of people who did the dishes
> $\approx$ *iff Kimberly and only Kimberly did the dishes*
>
> **false**   iff Kimberly does not overlap with the mereological sum of people who did the dishes
> $\approx$ *iff Kimberly did not participate in doing the dishes*
>
> **undef**   otherwise
> $\approx$ *iff Kimberly and somebody else did the dishes*

Crucially, negation switches truth and falsity but leaves undefinedness intact.

(7)   It wasn't Kimberly who did the dishes.

> **true**   iff Kimberly does not overlap with the mereological sum of people who did the dishes
> $\approx$ *iff Kimberly did not participate in doing the dishes*
>
> **false**   iff Kimberly is identical to the mereological sum of people who did the dishes
> $\approx$ *iff Kimberly and only Kimberly did the dishes*
>
> **undef**   otherwise
> $\approx$ *iff Kimberly and somebody else did the dishes*

Now, it is easy to see why the series of sentences '*It wasn't Kimberly who did the dishes. Kimberly and Helen did the dishes.*' is invariably predicted to be unacceptable under the homogeneity approach. In the situation in which Kimberly and Helen did the dishes, the cleft sentence '*It wasn't Kimberly who did the dishes.*' cannot be true since Kimberly does in fact overlap with the mereological sum of people who did the dishes. It also cannot be false, however, since Kimberly is not identical to the mereological sum of people who did the dishes (i.e., Helen did the dishes as well). Hence, it is undefined. Crucially, since under the homogeneity approach the truth conditions of cleft sentences are defined by overlap with or identity to the mereological sum of entities who satisfy the cleft predicate, it makes exactly the same predictions for distributively and non-distributively interpreted predicates.

2.3   Alternative-based approach

A contrasting account is the alternative-based approach, which postulates that the meaning of *it*-clefts is fully described by (at least) two meaning components: (i) the asserted canonical meaning of clefts, which is the same as its non-cleft Subject-Verb-

Object (SVO) counterpart, and (ii) the non-asserted exhaustive meaning component (e.g., Horn 1981, Destruel et al. 2015, De Veaugh-Geiss et al. 2015, Renans 2016a).[4]

(8)   It was Kimberly who did the dishes.

    a. Asserted meaning component:
        Kimberly did the dishes.

    b. Non-asserted meaning component:
        Kimberly and nobody else did the dishes.

The various theories differ in terms of how the non-asserted exhaustive meaning component comes about. For concreteness, we will discuss in detail the account in Velleman et al. 2012, which analyzes clefts as focus-sensitive inquiry-terminating operators indicating a complete answer to the Question Under Discussion (QUD) (Roberts 1996). In particular, clefts assert $\text{MIN}_S(p)(w)$ and presuppose $\text{MAX}_S(p)(w)$, shown in (9).[5]

(9) $\text{CLEFT}_S = \lambda w.\lambda p\colon \text{MAX}_S(p)(w).\text{MIN}_S(p)(w)$

    a. Asserted (MIN): There is a true answer at least as strong as p.
    b. Presupposed (MAX): No true answer is strictly stronger than p.
                                 [based on ex. (22) in Velleman et al. 2012]

For the sake of illustration, consider both example (10) and the figure in (11), which shows the contextual alternative answers in the entailment scale corresponding to the QUD '*Who laughed?*' (example from Velleman et al. 2012: §4.1).

(10)   It was Alice who laughed.

(11)

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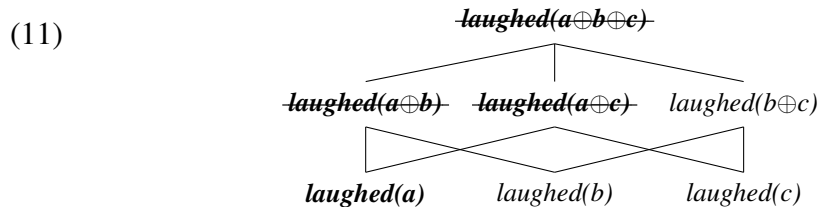
[4] We ignore here another meaning component of *it*-clefts, the *existence presupposition*, from which various approaches (e.g., Pollard & Yasavul 2016, Destruel & De Veaugh-Geiss 2018, De Veaugh-Geiss et al. 2018; see also Horn 1981) derive the exhaustive meaning. In direct contrast, Büring & Križ (2013: §6) argue that the existence presupposition is independent of the exhaustivity inference, if it is encoded in *it*-clefts at all.

[5] Following Heim & Kratzer's (1998) convention, the presupposed material is between the semicolon and the dot.

In a domain including three individuals, Alice, Bob, and Carol, MIN asserts that Alice laughed, i.e., that there must be a true answer in the following set, illustrated in (11) by boldface text.

$$\{laughed(a), laughed(a{\oplus}b), laughed(a{\oplus}c), laughed(a{\oplus}b{\oplus}c)\}$$

MAX, on the other hand, presupposes that no true answer is strictly stronger than Alice laughed, thus excluding the alternatives *laughed(a⊕b)*, *laughed(a⊕c)*, and *laughed(a⊕b⊕c)*. This is illustrated in (11) by strikethrough text. Therefore, the inquiry-terminating approach correctly predicts that the sentence '*It was Alice who laughed.*' obtains the interpretation that Alice laughed and only Alice laughed.

Now consider the negated sentence in (12). In this case, MIN asserts that Alice did not laugh, nor did any of the pluralities containing Alice laugh. As Velleman et al. (2012: p. 455) write: "[S]ince laughed is a distributive predicate, this is just the same as saying Alice didn't laugh", shown in (13).

(12)   It wasn't Alice who laughed.
$$\neg\text{MIN}(laughed(a)) \vDash \neg laughed(a) \wedge \neg laughed(a{\oplus}b)$$
$$\wedge \neg laughed(a{\oplus}c) \wedge \neg laughed(a{\oplus}b{\oplus}c)$$

(13) $\neg\text{MIN}(laughed(a)) = \neg laughed(a)$

As for the MAX meaning component, illustrated in (14), it again presupposes that "no larger group including Alice laughed, though Alice alone might have" (Velleman et al. 2012: p. 455). Thus, the negated sentence in (12) asserts that Alice didn't laugh (MIN) and presupposes that no plurality containing Alice laughed (MAX).

(14) $\text{MAX}(laughed(a)) \vDash \neg laughed(a{\oplus}b) \wedge \neg laughed(a{\oplus}c)$
$$\wedge \neg laughed(a{\oplus}b{\oplus}c)$$

Under the inquiry-terminating approach it is straightforward to explain why the series of sentences in (15) is predicted to be unacceptable. Namely, there is a contradiction given the distributive interpretation of the predicate *to laugh*. That is, the *it*-cleft in the first sentence asserts that Alice did not laugh, while the second sentence entails that Alice did laugh.

(15)   #It wasn't Alice who laughed. Alice and Bob laughed.
   a.   *It wasn't Alice who laughed.*
         Asserted (MIN): Alice did not laugh.
         Presupposed (MAX): No plurality containing Alice laughed.
   b.   *Alice and Bob laughed.*
         Asserted: Alice laughed.

Crucially, the situation is different when the predicate is interpreted non-distributively. Consider example (16) in a context such as (5b), in which there is a collective dish-washing event. Since under a non-distributive interpretation of the mixed predicate, the predicate predicates of the plurality but not of the atomic elements forming the plurality, it can be so that the predicate is false of the atomic individual *Kimberly* but true of the plurality *Kimberly and Helen*.

(16)   [under the non-distributive interpretation in (5b):] Helen and Kimberly live together. Yesterday Helen cooked, but they did the dishes together.

It wasn't Kimberly who did the dishes. Kimberly and Helen (together) did the dishes.

    a.   *It wasn't Kimberly who did the dishes.*
        Asserted (MIN): Kimberly did not do the dishes alone, although a plurality containing Kimberly may have done the dishes.
        Presupposed (MAX): no entailment relationship between the alternatives; thus, no presupposition failure.
    b.   *Kimberly and Helen (together) did the dishes.*
        Asserted: The plurality containing Kimberly and Helen did the dishes.

As a result, the sentences in (16) with a non-distributive interpretation result in a non-contradictory series of sentences, illustrated in (16a)–(16b). As for the presupposition, since there is no entailment between alternatives and thus no ordering with respect to one another, there is no presupposition failure and thus the series of sentences in (16) is predicted to be acceptable.[6]

In sum, under the alternative-based approach the acceptability of '*It wasn't α that did P. α and β did P.*' will depend on the interpretation of the predicate: while with distributively interpreted predicates the series of sentences is unacceptable, with non-distributively interpreted predicates it is acceptable.

2.4   Predictions

In this section, we spell out the different predictions for non-cleft SVO sentences and *it*-clefts depending on the distributive vs. non-distributive interpretation of the predicate.[7] We start with SVO sentences, an example of which is provided in (17).

(17)   Kimberly didn't do the dishes. Kimberly and Helen did the dishes.

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6 That is, under a non-distributive interpretation of the predicate the alternative answers to the QUD are not ordered via entailment relations, and thus no alternative answer will ever be excluded by MAX.
7 We are discussing here the inquiry-terminating approach for the sake of concreteness; however, the predictions extend to other analyses within the alternative-based approach to the semantics of clefts.

For the series of sentences in (17) with a distributive interpretation of the predicate, $x \notin [\![P]\!]$ followed by $(x \oplus y) \in [\![P]\!]$ will result in a contradiction. The contradiction arises because distributive predicates have atomic entities in their denotation, and therefore it follows from $(x \oplus y) \in [\![P]\!]$ that $x \in [\![P]\!]$, which contradicts the first sentence stating that $x \notin [\![P]\!]$. By contrast, for a non-distributive interpretation of the predicate, asserting $x \notin [\![P]\!]$ followed by $(x \oplus y) \in [\![P]\!]$ will not result in a contradiction, since collective predicates do not have atomic entities in their denotation, and thus it does not follow from $(x \oplus y) \in [\![P]\!]$ that $x \in [\![P]\!]$. Therefore, it is possible that $x \notin [\![P]\!]$ but $(x \oplus y) \in [\![P]\!]$.

Given this, non-cleft SVO sentences serve as a baseline measure for contradictions in distributive contexts and the lack thereof in non-distributive contexts. A summary of predictions is provided in (18).

(18)   Kimberly didn't do the dishes. Kimberly and Helen did the dishes.

        under the distributive interpretation in (5a):
        a.   1st sentence: Kimberly did not do the dishes.
        b.   2nd sentence: Kimberly did the dishes.
            ⤳ contradiction ⇒ **unacceptability**   (indicated by × in Table 1)

        under the non-distributive interpretation in (5b):
        a.   1st sentence: Kimberly did not do the dishes alone, although a plurality containing Kimberly may have.
        b.   2nd sentence: Kimberly and Helen did the dishes (but Kimberly alone did not do them).
            ⤳ no contradiction ⇒ **acceptability**   (indicated by ✓ in Table 1)

Now consider an *it*-cleft sentence such as (19) and the predictions with distributively and non-distributively interpreted predicates.

(19)   It wasn't Kimberly who did the dishes. Kimberly and Helen did the dishes.

We will start with the homogeneity approach. Büring & Križ (2013: pp. 10–11) write:

> "In sum, **we believe that distributive and collective predicates behave identically in clefts**: If *a* is a proper part of those who *Q*, *it was a that Qed* is undefined, rather than false."   [emphasis added]

They provide the following empirical generalization.

(20)   #It wasn't Fred she invited. She invited Fred and Gord.
                        [ex. (3b) in Büring & Križ 2013]

Under the homogeneity approach in Križ 2017, the negated cleft sentence in (21) gives rise to the following truth-conditions (repeated from example (7) for the reader).

(21) It wasn't Kimberly who did the dishes.

> **true** iff Kimberly does not overlap with the mereological sum of people who did the dishes
> ≈ *iff Kimberly did not participate in doing the dishes*
>
> **false** iff Kimberly is identical to the mereological sum of people who did the dishes
> ≈ *iff Kimberly and only Kimberly did the dishes*
>
> **undef** otherwise
> ≈ *Kimberly and Helen did the dishes*

Crucially, the truth-conditions of (21) do not change depending on the interpretation of the predicate. Therefore, in the context in which Kimberly and Helen did the dishes — whether they did it distributively as in (5a) or non-distributively as in (5b) — the homogeneity approach predicts the first sentence of the sequence in (22) to be undefined.[8]

(22) #It wasn't Kimberly who did the dishes. Kimberly and Helen did the dishes.

> under a distributive (5a) and non-distributive (5b) interpretation:
> a. 1st sentence: undefined
> ⤳ undefinedness ⇒ **unacceptability** (indicated by × in Table 1)

In short, the homogeneity approach does not predict that the acceptability of '*It wasn't α that did P. α and β did P.*' will depend on the interpretation of the predicate: for both distributively and non-distributively interpreted predicates the series of sentences is expected to be unacceptable. Therefore, while the homogeneity approach predicts *it*-clefts to elicit equally unacceptable judgments under both predicate interpretations, non-cleft SVO sentences are predicted to be unacceptable with distributively interpreted predicates, on the one hand, yet acceptable with non-distributively interpreted predicates, on the other — thus, resulting in an interaction of predicate interpretation (distributive vs. non-distributive) and sentence type (*it*-cleft vs. SVO).[9]

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8 Here we assume, following Križ 2017, that the negation in (22) is a truth-conditional negation. In Section 4 we will discuss the possibility of analyzing it as a metalinguistic negation, an option also mentioned in Büring & Križ 2013 and Križ 2017.

9 In previous literature it has been proposed that conjunction also gives rise to homogeneity (see Szabolcsi & Haddican 2004; but note that homogeneity is defined there differently from that in Križ 2017 and, moreover, it is defined only for distributive predicates). Nevertheless, Križ (2017: p. 23)

By contrast, according to the inquiry-terminating approach in Velleman et al. 2012, *it*-clefts under distributively vs. non-distributively interpreted predicates will obtain divergent judgments. As Velleman et al. (2012: p. 455) write:

> We do [. . .] predict that [example (23)] should be infelicitous.

> (23)   ??It wasn't Alice who laughed, it was Alice and Bob.
>   [example (31) in Velleman et al. 2012]

> Note, though, that this prediction depends crucially on the fact that *laughed* is a distributive predicate. If we replace it with a non-distributive predicate, as in [example (24)], we predict felicity. [. . .] This matches our intuitions — though we must admit that these are subtle intuitions, and further empirical evidence here would be helpful.

> (24)   It wasn't ALICE who moved the sofa, it was Alice AND the
>   OTHER movers.
>   [example (32) in Velleman et al. 2012]

Thus, the inquiry terminating approach makes the following predictions regarding the series of sentences in (25), which is parallel to non-cleft SVO sentences; cf. (18).

(25)   It wasn't Kimberly who did the dishes. Kimberly and Helen did the dishes.

          under the distributive interpretation in (5a):
          a.   1$^{\text{st}}$ sentence
                Asserted (MIN): Kimberly did not do the dishes.
                Presupposed (MAX): No plurality containing Kimberly did the dishes.
          b.   2$^{\text{nd}}$ sentence
                Asserted: Kimberly did the dishes.
                ⇝ contradiction ⇒ **unacceptability**   (indicated by × in Table 1)

          under the non-distributive interpretation in (5b):

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writes: "[. . .] 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." If we assume that conjunction does in fact give rise to homogeneity as defined in Križ 2017, however, then the SVO sentences '*Kimberly didn't do the dishes. Kimberly and Helen did the dishes.*' are predicted to give rise to a uniform pattern of responses in both distributive and non-distributive contexts. Yet, this is not what we found in our experimental data. We thank the anonymous reviewer who pushed us to clarify this issue.

    a.   1st sentence

        Asserted (MIN): Kimberly did not do the dishes alone, although a plurality containing Kimberly may have.

        Presupposed (MAX): no entailment relationship between the alternatives; thus, no presupposition failure.

    b.   2nd sentence

        Asserted: The plurality containing Kimberly and Helen did the dishes (but Kimberly alone did not do them).

        ⇝ no contradiction ⇒ **acceptability**   (indicated by ✓ in Table 1)

In sum, the inquiry-terminating account in Velleman et al. 2012 predicts that the acceptability of '*It wasn't α that did P. α and β did P.*' will depend on the interpretation of the predicate — distributively interpreted predicates will be unacceptable, while non-distributively interpreted predicates will be acceptable — and the same predictions hold for the various other theories in the alternative-based approach. Moreover, *it*-clefts are predicted to show parallel response patterns to non-cleft SVO sentences, and thus no interaction of predicate interpretation and sentence type is expected.

    A summary of predictions for the homogeneity approach and the alternative-based approach is presented in Table 1. In short, under the homogeneity approach acceptability for *it*-clefts and their non-cleft SVO counterparts is expected to show divergent patterns depending on the interpretation of the predicate: critically, *it*-clefts are predicted to be unacceptable across distributive vs. non-distributive interpretations, resulting in an interaction of predicate interpretation and sentence type. By contrast, under the alternative-based approach, *it*-clefts and their non-cleft SVO counterparts are predicted to show parallel response patterns, and thus no interaction. We tested these predictions in three experiments, which we turn to next.

	SVO	*it*-CLEFT	
		homogeneity	*alternative-based*
DISTRIBUTIVE	×	×	×
NON-DISTRIBUTIVE	✓	×	✓

Table 1   Summary of predictions for the acceptability of non-cleft SVO and *it*-cleft sentences for the series of sentences such as '*It's not α that did P. α and β did P.*' with distributively and non-distributively interpreted predicates.

3 Experiments

In order to check the predictions in Table 1, we conducted three experimental studies using an acceptability judgment task with American English native speakers as participants. In Section 3.1 we present the methods and design for Experiment 1, in which written stimuli were used to test the predictions of the homogeneity and alternative-based approaches. Although we found a reliable main effect of distributive vs. non-distributive predicate interpretation on acceptability judgments, there remained a lot of variability in the response patterns for non-distributive interpretations of the predicates, which we postulate was mostly due to the use of written stimuli. Therefore, we conducted two follow-up studies, which we present in Section 3.2 and Section 3.3. The first follow-up study, Experiment 2, was based on Experiment 1, except auditory stimuli were used in order to control for the effects of prosody on the acceptability of the target sentences in context. The second follow-up study, Experiment 3, similarly employed auditory stimuli, but in this experiment we used solely mixed-predicates, unlike in the previous two experiments, in which we used both mixed and distributive predicates. Anticipating the results, in all three studies we found a robust effect of predicate interpretation on the acceptability of the sentences in context, for both SVO sentences and *it*-clefts, contrary to the predictions of the homogeneity approach but consistent with the alternative-based approach.

3.1 Experiment 1

3.1.1 Methods

Participants   We tested 24 monolingual American English speakers (18 female, 6 male; mean age: 38, age range: 23–64).[10] All participants self-reported as having grown up in the continental U.S.A. with English as their native language. All but two of the 24 participants reported speaking at least one foreign language, albeit with varying degrees of proficiency, and all participants had a Bachelor's degree or higher.

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10 For transparency, 26 participants in total completed the questionnaire but two participants were removed for not being monolingual speakers. Furthermore, we note that six of the participants saw a version of the experiment which had a typo in two of the target items and a minor typo in the filler, which were corrected for the remaining participants. The typos and corrections were as follows: for target item 15 in habitual contexts, "Bill Lawrence" was corrected to "Bill and Lawrence"; for target item 06 in episodic contexts, "didn't won" was corrected to "didn't win"; and for filler item 07 "MoMa" was corrected to "MoMA". We found no difference in judgments despite the typos and have left the six participants in our data set.

Materials   Experiment 1 employed a fully-crossed 2x2 factorial design with the factors *Context* (2 levels: DISTRIBUTIVE, NON-DISTRIBUTIVE) and *Sentence* (2 levels: *it*-CLEFT, SVO). In total 40 target items and 80 filler items were tested, for a 1:2 target-to-filler ratio. All items had unique lexicalizations distributed in a Latin square design across four lists. For a full list of items, see Appendix B.

Crucially, we used predicates whose distributive vs. non-distributive interpretation was triggered by contextual manipulations rather than the lexical meaning of the predicate alone. For instance, the context in (26a) makes it clear that Carlos and Andrea biked individually, whereas (26b) establishes that the biking event applies to a collective plural entity. Contexts as in (26) were followed by a target sentence for participants to evaluate, which was either an *it*-cleft as in (27a) or a non-cleft SVO sentence as in (27b).

(26)   *Context*   [Exp. 1, Episodic, Item 10]
      a.   Carlos and Andrea like biking in a nearby forest. However, they have never seen each other there! Last week, Carlos biked on Monday and Andrea biked on Wednesday.   [DISTRIBUTIVE]
      b.   Carlos and Andrea like biking. They own a tandem bike and they use it all the time! Last week, they biked in a nearby forest together.
                                                             [NON-DISTRIBUTIVE]

(27)   *Sentence*
      a.   It wasn't Carlos who biked. Carlos and Andrea biked.   [*it*-CLEFT]
      b.   Carlos didn't bike. Carlos and Andrea biked.   [SVO]

In this experiment both distributive and mixed predicates were used, the interpretations of which were manipulated contextually. Using distributive predicates was based on the observation in Renans 2016a,b that distributive predicates in clefts can be reinterpreted non-distributively as a rescue strategy. Thus, we assume that in the context of (28b) — though not in (28a) — the predicate *to give birth* in (29) can be reinterpreted in a non-distributive manner.

(28)   *Context*   [Exp. 1, Episodic, Item 01]
      a.   Jacob and Ryan are Maria's children. Jacob is fifteen and Ryan is two.   [DISTRIBUTIVE]
      b.   Jacob and Ryan are twins, sons of Maria.   [NON-DISTRIBUTIVE]

(29)   *Sentence*
      a.   It's not Ryan Maria gave birth to. She gave birth to Jacob and Ryan.
                                                            [*it*-CLEFT]

> b. Maria didn't give birth to Ryan. She gave birth to Jacob and Ryan.
> [SVO]

We thank the two anonymous reviewers who pointed out that the coerced interpretation of lexically distributive predicates in non-distributive contexts obtains the interpretation that the two individuals are participants in the same event at the same time or place, and neither was a participant in the event alone, giving rise to a spatio-temporally contiguous, communal, or coordinated interpretation rather than a 'truly' collective one.[11] For Experiment 1 and Experiment 2, in which we used both distributive as well as mixed predicates, we assume that after reinterpretation of the distributive predicate in a non-distributive manner there will no longer be an entailment relation between, e.g., '*Maria gave birth to Jacob and Ryan*', on the one hand, and '*Maria gave birth to Ryan*', on the other — for example, by coercing an interpretation of the predicate *to give birth* in the context of (28b) such that it only holds of twins. Crucially, in order to make sure that in non-distributive contexts a 'truly' collective non-distributive interpretation was obtained, for Experiment 3 we reran the experiment with mixed predicates only; see Section 3.3 for details.[12]

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11 A similar observation was made by Onea (2007) regarding Hungarian pre-verbal focus sentences comparable to the stimuli here, such as in (ia)–(ib) (judgments from the original).

(i) a. ??Nem PÉTER kapott tízest,   hanem Péter és   PÀL (kapott tizest).
        not Peter got   ten-ACC but   Peter and Paul got   ten-ACC
        '*It isn't Peter who got a ten (grade), it's Peter and Paul who got a ten (grade)*'
     b. Nem Péter aludt a   padlón, hanem Péter és Pál (aludt a   padlón).
        not   Peter slept the floor.on but   Peter and Paul slept the floor.on
        '*It isn't Peter who slept on the floor; it's Peter and Paul who slept on the floor.*'
                    [ex. (12) and ex. (3) in Onea 2007, respectively, with minor modifications]

Onea (2007: 173) writes with regards to (ia): "[the sentence in (ia)] is weird for most speakers, except for some reading in which Peter and Paul got a grade for a joint work". Onea continues: "This shows that this kind of negation will only work in cases in which the conjunction delivered in the second clause can be conceived as referring to participants of the same event. Hence (ib) can only have the reading according to which Peter and Paul slept both on the floor at the same time. [...] But if Peter and Paul are the participants of a particular event, *the statement that Peter is the participant of the event is false*" (emphasis added). If this line of thinking is correct, then the results for Experiment 1 and Experiment 2 with lexically distributive predicates are unsurprising: it is clear from the context that neither individual was the sole participant in the relevant event.

12 As one reviewer pointed out, the predictions for Velleman et al. 2012 differ when assuming that an entailment relation holds despite a spatio-temporally contiguous, communal, or coordinated interpretation: acceptability judgments for 'truly' lexical predicates, with reference to entailment, should be the same across contextual manipulations, contrary to fact. In this case, the results for Experiment 1 and Experiment 2 are potentially unexpected for all theories discussed here ("potentially" since mixed predicates were also used). We thank the reviewer for pointing this out. Given the empirical picture presented here — in particular the results of the follow-up Experiment 3, in which only mixed predicates were used — we will leave the issue of entailment relations for 'truly' collective vs.

The decision to have contextual manipulations for predicate interpretation rather than using lexically distributive and collective predicates was threefold. First, as mentioned above, it has been observed that distributive predicates can be reinterpreted in a non-distributive manner as a rescue strategy (Renans 2016a,b). Thus, contextual manipulations were necessary to ensure that participants were presented with the interpretation we intended. Second, we aimed at having singular entities in the cleft pivot, both to keep the cognitive demands of the task to a minimum in terms of the number of referents introduced per trial as well as to follow the example sentences discussed in the cleft literature. Yet, singular entities are impossible with lexically collective predicates, such as *to disperse* or *to gather*. Third, contextual manipulations allowed us to present participants with the intended interpretation of the predicate without changing the predicates themselves, thus making a fully-crossed 2x2 design for the factors *Context* x *Sentence* possible.

There are two additional points to make regarding the construction of the target items in Experiment 1: First, we also systematically manipulated aspectual reference to ensure that the decisive factor for the evaluation of the sentence is the distributive vs. non-distributive interpretation of the predicate, and not aspectual interpretation. Thus, there was an additional between-item factor *Aspect* (2 levels: EPISODIC, HABITUAL), such that all conditions were tested with both episodic (20 items) and habitual (20 items) readings; see Appendix B for details.

Second, in order to make sure that there was no influence of the order of conjuncts on acceptability judgments, for the factor *Sentence* we additionally counterbalanced the ordering of the conjuncts in the second of the two sentences. The even-numbered items (2, 4, 6, and so on) for the episodic readings and the odd-numbered items (1, 3, 5, and so on) for the habitual readings had the word order '… α *and* β *did P*' in the second sentence, as in the examples (27b)–(27a) above (e.g., '*It wasn't Carlos who biked. Carlos and Andrea biked.*'). By contrast, the odd-numbered items (1, 3, 5, and so on) for the episodic readings and the even-numbered items (2, 4, 6, and so on) for the habitual readings had the word order '… β *and* α *did P*' in the second sentence (e.g., '*It's not Patricia who plays computer games. Martha and Patricia play computer games.*'). There is no evidence that the order of conjuncts influenced acceptability judgments.

Regarding the filler items, we included multiple cleft and cleft-like structures, both with and without negation (see Appendix C for sample filler items). Specifically, we included 20 *wh*-clefts, 20 expletive sentences, 20 *it*-clefts, and 20 definite pseudoclefts. An example trial for the *wh*-cleft is as follows (example filler item F01).

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spatio-temporally contiguous, communal, or coordinated interpretations as a compelling puzzle for future research.

16

(30)   *Context*: Diana is spending her holidays in California and Gary is spending his holidays in Texas.
Filler: Where Diana and Gary are spending their holidays is not Canada. They're spending their holidays in the USA.   [F01]

Of the 20 *wh*-clefts, 10 included negation (as in the above), whereas 10 did not (for example items, see F01–F04 in the appendix). Moreover, 5 of the sentences with negation were intended to be semantically coherent and acceptable (as in the above) and 5 semantically incoherent and unacceptable (see, e.g., F02); the same held for the sentences without negation (see, e.g., F03–F04).

With the term expletive sentences we intend sentences which at the onset are the same as *it*-clefts, such as the following.

(31)   *Context*: George gave a radio interview in which he recommended two museums to visit: MoMA in New York and The Louvre in Paris.
Filler: It's obvious that George recommended MoMA and The Louvre.
      [F07]

Again, of the 20 expletive sentences, 10 included negation, whereas 10 did not (as in the above; for further example items, see F05–F08 in the appendix). Moreover, 5 of the sentences with negation were intended to be semantically coherent and acceptable (as in the above) and 5 semantically incoherent and unacceptable (see, e.g., F06); again, the same held for the sentences without negation (see, e.g., F07–F08).

Finally, the *it*-cleft and definite pseudocleft manipulations were such that the element which appeared in the cleft pivot or after the copular verb included expected or unsurprising entities in half the trials (e.g., *photo* in the context of social media) and unexpected or surprising entities in half the trials (e.g., *ransom note* in the same context). In all trials, a violation of exhaustivity occurred in the second conjunct. These items were distributed in a Latin square design across the four lists. Examples for the *it*-cleft (F09–F10) and definite pseudocleft (F11–F12) trials are as follows.

(32)   *Context*: Michael is on his favorite social network each and every day.
Filler: It's a {photo/ransom note} that Michael posted and he posted a video.   [F09–F10]
Filler: The thing that Michael posted is a {photo/ransom note} and he posted a video.   [F11–F12]

Procedure   In each trial, participants were presented with a short description of the context and a target sentence, both of which were in written form. They were instructed that their task was to provide judgments on a scale from 1 ('unacceptable') to 7 ('acceptable') of the sentences in context. In order to become familiar with

the task, participants were given three practice trials before the experiment began. The experiment was conducted online using the free software platform OnExp (GNU General Public License) hosted at the Universität Göttingen (https://onexp. textstrukturen.uni-goettingen.de/). All items were randomized during presentation. The task took about 35–45 minutes to complete, and participants were compensated $7.00 for their participation.

3.1.2 Results

We conducted a Bayesian ordinal mixed logistic regression analysis; see Bürkner & Vuorre 2018 for a tutorial on ordinal regression using *brms*, as well as Liddell & Kruschke 2018 for a discussion of ordered-probit models in a Bayesian framework and Kruschke & Liddell 2018 for general introductions to Bayesian modelling. We used the statistics software *R* (v. 3.5.2, GPL-2 | GPL-3; R Core Team 2018) with the *brms* package (v. 2.7.0, GPL >= 3; Bürkner 2017, 2018), which provides an interface to fit Bayesian models using Stan (New BSD License; Stan Development Team 2018).

We used sum contrasts for the factors *Sentence* (CLEFT −1, SVO 1) and *Context* (DISTRIBUTIVE −1, NON-DISTRIBUTIVE 1), and we included maximal random-effects structures in our statistical models, with varying intercepts and slopes for both participants and items. Moreover, we used regularizing, weakly-informative priors in order to downweight extreme values and obtain stable inferences (Vasishth et al. 2018).[13] We report point estimates of the parameters from the posterior distribution along with the 95% credible intervals (given these data and the model, the interval

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13 The model for Experiment 1, which included the factor *Aspect* (EPISODIC −1, HABITUAL 1), is as follows; note that the models for Experiment 2 and Experiment 3 were identical minus *Aspect*.

```
brm(formula = Acceptability ~ 1 + Context * Sentence * Aspect +
            (1 + Context * Sentence * Aspect | Participant) +
            (1 + Context * Sentence | Item),
    data = exp1, family = cumulative('probit'),
    prior = c(set_prior('normal(0, 3)', class = 'Intercept'),
              set_prior('normal(0, 3)', class = 'b'),
              set_prior('normal(0, 3)', class = 'sd'),
              set_prior('lkj(2)', class = 'cor')),
    inits = 0, iter = 4000, cores = 4, chains = 4,
    seed = 2701, control = list(adapt_delta = 0.99))
```

We note that there was some weak evidence of an effect of *Aspect* ($\hat{\beta}$ = −0.13; 95% CrI: −0.29, 0.02) and of an interaction of *Aspect* x *Context* ($\hat{\beta}$ = −0.11; 95% CrI: −0.24, 0.03); nonetheless, the credible intervals suggest that the estimates may in fact be zero or on the other side of zero. Assuming for now a true effect exists, we think it is plausible that — as a rescue strategy — it may be easier to coerce a non-distributive interpretation of the predicate in episodic contexts than in habitual ones, since the latter leave more space for additional interpretation. For instance, participants may ask themselves
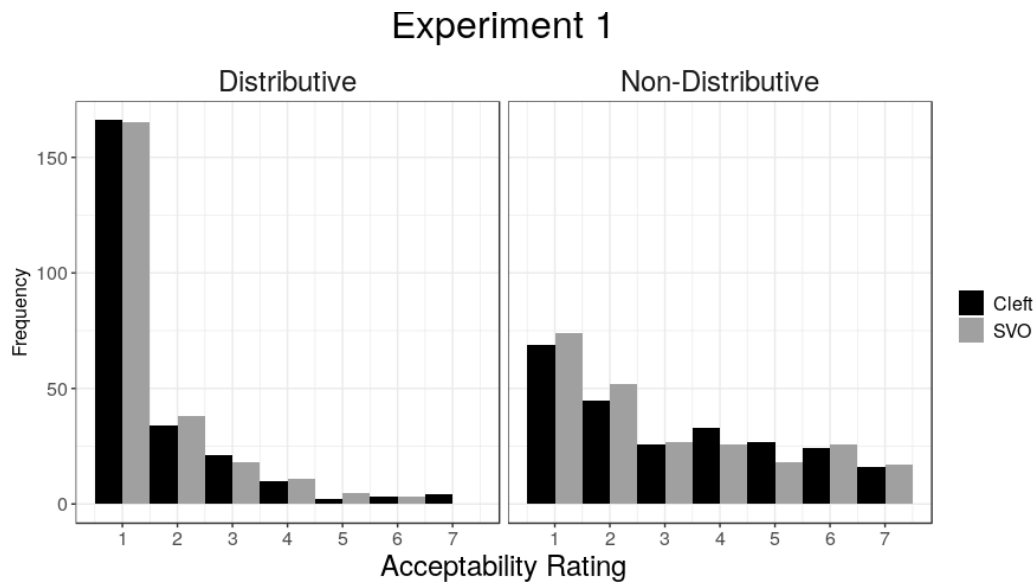
Experiment 1

Figure 1   Acceptability ratings (7-point scale: 1 '*unacceptable*' – 7 '*acceptable*')
shown as histograms for Experiment 1 (written).

containing the 95% most credible values of the parameter, abbreviated as 95% CrI).
If the credible interval overlaps with zero we interpret that as lack of evidence of
an effect: we remain uncertain whether the parameter is zero (no effect) or has the
wrong sign. In cases when the overlap is very minimal, however, with almost all of
the probability density on one side of zero, we will report this as weak evidence that
an effect is present. By contrast, should the credible interval have no overlap with
zero we will interpret that as reliable evidence of a robust effect.

To get a sense of the shape of the data for Experiment 1, we start with visual
inspection of the histogram in Figure 1 showing the frequency of the discrete
acceptability ratings from '1'–'7'. As can be seen, sentences in contexts triggering
a distributive reading were largely judged as unacceptable, with ca. 92% (each:
221/240) of acceptability judgments for both clefts and non-cleft SVO sentences
falling below the middle '4' value, with a clear majority of judgments at '1', the
lowest rating on the scale. In comparison, contexts triggering a non-distributive
reading — though having a large number of negative responses — nonetheless display
a wide spread across the scale: 58% (140/240) of the acceptability judgments for
clefts and 64% (153/240) for SVO sentences fell below the middle '4' value, whereas

whether the agents always really did the relevant activity together. That said, statistically the effect of
aspect reported here is weak at best and nevertheless unreliable, and we will not discuss this further.

28% (67/240) of the judgments for clefts and 27% (61/240) for SVO sentences fell above the middle '4' value.

Nevertheless, statistically — given the highly positive coefficient of *Context* from the ordered-probit model ($\hat{\beta}$ = 0.77; 95% CrI: 0.53, 1.01) — results indicate that there was a main effect of context: sentences in distributive contexts are reliably judged as less acceptable than sentences in non-distributive contexts. Moreover, there is no statistical evidence of an effect for either *Sentence* ($\hat{\beta}$ = –0.05; 95% CrI: –0.19, 0.07) nor evidence of an interaction of *Context* x *Sentence* ($\hat{\beta}$ = 0.01; 95% CrI: –0.10, 0.12), as the credible intervals for both estimates have a high degree of overlap with zero.

Interim discussion   The main result of the first study is that the interpretation of the predicate was found to influence the acceptability of both *it*-clefts and SVO sentences: that is, sentences in contexts triggering a distributive interpretation were judged as overall less acceptable than sentences in contexts triggering a non-distributive interpretation, with no evidence of an interaction with sentence type. The parallel response patterns for SVO sentences and clefts is consistent with the alternative-based approach; furthermore, the results pose a direct challenge for the homogeneity approach, since *it*-clefts are predicted to be equally unacceptable under both distributive and non-distributive interpretations, contrary to what we found.

That said, although we found a difference between contexts as expected in the alternative-based approach, the ratings for both SVO and cleft sentences under a non-distributive interpretation were spread broadly across the scale — and included a high frequency of low judgments, which was not predicted. We can think of two reasons that might have caused the relatively low acceptability ratings in non-distributive contexts. First, the low judgments could be a local effect (cf., for instance, Hemforth 2018). Namely, there were twice as many filler items as target items in Experiment 1, many of which were intended to be perfectly coherent and acceptable; see the discussion of the filler items. By contrast, the judgments for clefts and SVO sentences are quite subtle. In fact, four of the conditions in the filler (namely, *wh*-clefts and expletive sentences with and without negation) were judged as acceptable by participants with 75% to 96% of the judgments above the middle '4', of which a majority were '7', the highest rating on the scale. The almost ceiling-like responses for these conditions could in turn push the evaluation of the other less-robust conditions lower.

Second, and crucial for the two follow-up studies presented in the following sections, the overall low judgments could be caused by the varying implicit prosody participants assigned to the written stimuli (Fodor 2002a,b, Koizumi 2009). That is, contrastive focus — and not simple declarative prosody with H* pitch accent at the beginning of the sentence and a falling boundary tone — appears to be important

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to make the sentences in collective contexts acceptable.[14] Thus, in order to control for prosodic assignment in our stimuli we ran two follow-up studies using auditory stimuli.

3.2 Experiment 2

In this and the following section we discuss two follow-up experiments using auditory stimuli instead of written stimuli.

3.2.1 Methods

Participants   For Experiment 2, we tested 32 monolingual American English native speakers (12 female, 20 male; mean age: 30, age range: 18–47). All participants were self-reported American English native speakers who grew up in the continental U.S.A. Of these participants, 27 reported knowing no foreign languages, while 5 reported speaking at least one foreign language; as for education, 21 participants had a Bachelor's degree or higher, 10 had a high school degree, and 1 had not completed high school.

Materials   Only a subset of the stimuli from Experiment 1 was used for the follow-up Experiment 2. Doing so allowed us to reduce the length and complexity of the experiment given the more time-consuming and cognitively-demanding task of listening to and processing auditory stimuli. Thus, in contrast to the experiment with written stimuli, Experiment 2 tested a total of 20 target items (all with an episodic interpretation) plus 32 filler items, the latter being a subset of the *wh*-cleft and expletive sentence filler items from Experiment 1. All items were presented with a unique lexicalization in each condition, distributed in a Latin square design across four lists.

   Although the filler and target stimuli in Experiment 2 were a subset of the stimuli in Experiment 1, note that for the factor *Sentence* we changed the order of conjuncts in the second clause in the target items. That is, whereas in the written version of the experiment the odd- and even-numbered items differed (see Section 3.1 "Material" for details), in the auditory version of the experiment all items followed the same pattern: the argument which appeared in the cleft pivot was invariably first amongst the two conjuncts and the conjunction remained unstressed (i.e., '... α *and* β *did P.*') (cf. Križ 2017: p. 23 regarding stressed vs. unstressed conjunction). This was done in order to keep the prosodic contours consistent across the items; see Appendix B.1.

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14 We are thankful to the editor for bringing this to our attention.

A male native English speaker from Canada in his mid-20s recorded all of the target and filler stimuli in a sound-proof acoustic lab with the audio-editing software Audacity (v. 2.2.2, GPL-2; Audacity Team 2018). To assist the speaker while reading aloud during the recording session, we provided a printout of the target sentences with pitch accents indicated by the use of all capitals on the stressed syllable, e.g., '*It wasn't CARlos who biked. Carlos and AnDREA biked*'. By contrast, for the filler sentences the instructions to the speaker were to read the sentences out loud in a way that felt natural. All sentences were recorded at least twice, from which we — with help from our student research assistant — selected the best recording for the experiment based on two criteria: (i) the pitch accent was placed at the intended location, and (ii) the recording sounded natural. Pitch accents in the target sentences were evaluated by the research assistant using the phonetics software Praat (v. 6.0.37, GPL-2; Boersma & Weenink 2018, Boersma 2001).[15]

Procedure   The procedure for Experiment 2 was identical to Experiment 1, with one major difference: although the context was still presented in written form, the target stimuli were now presented in auditory form. The instructions were identical to the written version of the experiment with the exception that we also provided instructions regarding, e.g., adjusting the volume of the participants' headphones; additionally, we used auditory stimuli for the practice trials.

As before, the experiment was conducted online using OnExp. Participants were recruited and payed via Prolific (https://www.prolific.ac/). Again, all items were randomized during presentation. Given the reduced length of the experiment, participants were compensated ca. $5.50 for their participation in Experiment 2.

3.2.2   Results

Again, we start with visual inspection of Figure 2 showing the histogram of acceptability ratings in order to get a sense of the overall shape of the data. When controlling for prosody, one sees that sentences in contexts triggering a non-distributive reading were judged as generally acceptable compared to sentences in contexts triggering a distributive reading, which were overall judged as unacceptable. Specifically, the percentage of '5'–'7' ratings in non-distributive contexts was ca. 72% for both clefts (115/160) and SVO sentences (116/160), with the majority of judgments at '6'–'7'; compare that to the percentage of '1'–'3' ratings at 19% (each: 31/160) for both sentence types, contrasting with the results of Experiment 1 with written stimuli. In distributive contexts, the opposite pattern was found: most of the judgments were at

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15 With permission, all recordings of the target stimuli are available at https://gitup.uni-potsdam.de/ deveaugh-it-clefts-collective-distributive/tree/master/auditory-stimuli.
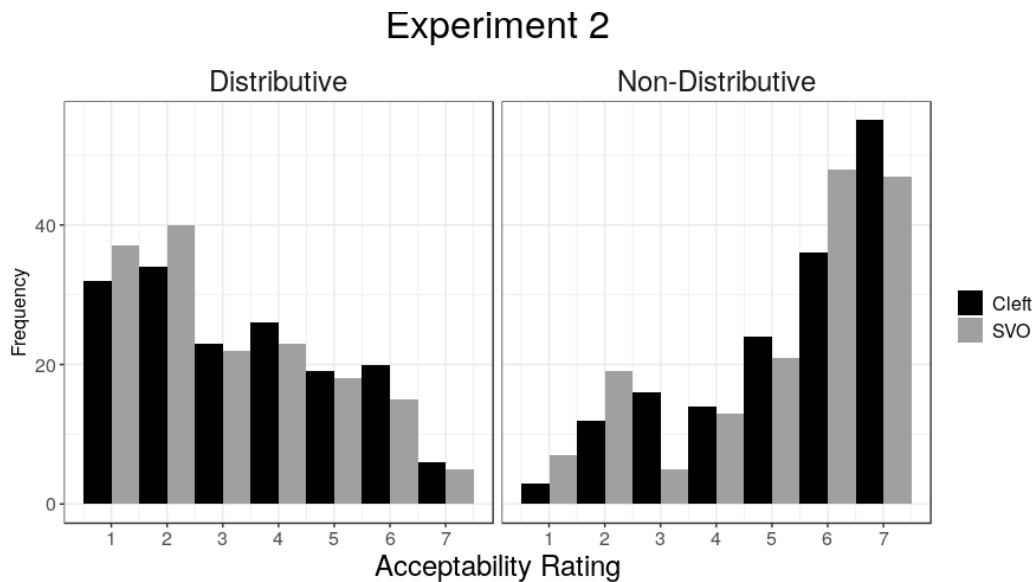
Figure 2   Acceptability ratings (7-point scale: 1 '*unacceptable*' – 7 '*acceptable*') shown as histograms for Experiment 2 (auditory).

the low end of the scale, with the percentage of '1'–'3' ratings at 56% (89/160) for clefts and 62% (99/160) for SVO sentences; cf. '5'–'7' ratings at 28% (45/160) for clefts and at 24% (38/160) for SVO sentences.

Just as for Experiment 1, we conducted a Bayesian ordinal mixed logistic regression analysis using sum contrasts for *Sentence* (CLEFT –1, SVO 1) and *Context* (DISTRIBUTIVE –1, NON-DISTRIBUTIVE 1). The highly positive coefficient estimate for *Context* ($\hat{\beta}$ = 0.95; 95% CrI: 0.62, 1.29) indicates that participants judged sentences in contexts triggering a distributive reading as less acceptable than sentences in contexts triggering a non-distributive reading — a statistically robust effect replicating the results of Experiment 1. Unlike Experiment 1, however, there is also weak evidence of an effect of *Sentence* ($\hat{\beta}$ = –0.09; 95% CrI: –0.20, 0.02), with non-cleft SVO sentences being judged as less acceptable overall than their *it*-cleft counterparts. Finally, we found no evidence of an interaction of *Context* x *Sentence* ($\hat{\beta}$ = 0.02; 95% CrI: –0.10, 0.15).

Interim discussion   As in Experiment 1, the results in Experiment 2 show that the distributive vs. non-distributive interpretation of the predicate had an influence on acceptability. As before, sentences in contexts triggering a distributive interpretation were judged as less acceptable than sentences in contexts triggering a non-distributive

interpretation, and no interaction with sentence type was found. Importantly, once we controlled for the prosodic contour of the items in the auditory version of the experiment, the results became more clear in the directionality on the ordinal scale, with non-distributive contexts eliciting mostly acceptable judgments and distributive contexts eliciting mostly unacceptable judgments. In the discussion of Experiment 3, we will return to the result that non-cleft SVO sentences were judged slightly worse than *it*-clefts, since there we replicate the effect of sentence type found in Experiment 2.

One worry that the anonymous reviewers had was that in Experiment 1 and Experiment 2 both mixed and distributive predicates were used. Therefore, we ran a third follow-up experiment (Experiment 3) with mixed predicates only, which we turn to next.

3.3 Experiment 3

The methods and design in Experiment 3 were the same as in Experiment 2, and therefore we will focus here on the crucial differences between the experiments, in particular, the predicates used in the target stimuli.

3.3.1 Methods

Participants   For Experiment 3, 40 monolingual American English native speakers (20 female, 16 male, 3 other, 1 no answer; mean age: 31, age range: 18–59) completed the task. All participants self-reported as having grown up in the continental U.S.A. Of the 40 participants, 30 reported knowing no foreign languages, while 10 spoke at least one foreign language. As for education, 25 participants had a Bachelor's degree or higher, 15 had a high school degree, and 1 participant did not respond to the question.

Materials   The second auditory follow-up, Experiment 3, was the same as Experiment 2 with one crucial difference: we used mixed predicates only. That is, whereas in the first two experiments we included target items which are considered truly distributive — assuming they can be coerced into a non-distributive interpretation as a rescue strategy; see Section 2 and Section 3.1.1 under "Materials" — for Experiment 3 we had solely mixed predicates for the target items. Furthermore, all target trials were controlled for to ensure that the interpretations of the predicates in non-distributive contexts were truly collective and not just spatio-temporally contiguous,

communal, or coordinated (see, e.g., Lasersohn 1998, Syrett & Musolino 2013). The diagnostics for being considered truly collective are as follows.[16]

i. *Separate-conjuncts test*: if the sentence can be rephrased as two separate conjuncts, the predicate is not really collective. Example: *Madison won the marathon, and Abigail (also) won the marathon.*

ii. *Time-locked test (via "at the same time")*: if the event can be time-locked with a phrase such as "at the same time", the predicate is not really collective. Example: *Owen proposed to Alice and Linda at the same time.*

iii. *"Each" test*: if the sentence can be rephrased with *each*, the predicate is not really collective. Example: *Benjamin and Anne each gave a speech.*

iv. *Just-one-individual test*: if the sentence can be felicitously rephrased such that just one of the individuals has the property in question, the predicate is not really collective. Example: *Of a collective piano-lifting event where A and B work together to lift the piano and move it from one room to another room. Q: Did A (single-handedly) lift the piano? A: No!*

Target items which satisfied the above tests were reused from Experiment 2. All remaining target items were constructed *ex novo*, although we tried to use predicates which have been discussed in the previous experimental literature as being mixed; see Appendix D for a full list of target stimuli from Experiment 3.

With the exception of the predicates used in the target stimuli, Experiment 2 and Experiment 3 were identical. Moreover, the same native speaker who was recorded for the auditory stimuli in Experiment 2 was again recorded for the target items in Experiment 3; see Section 3.2.1 under "Materials". We note that, whereas all target items were newly recorded for Experiment 3 (including target items which were the same as in early versions of the experiment), for the filler items we reused the recordings from Experiment 2. Thus, in order to correct minor differences in volume levels, the new recordings had to be adjusted slightly using the audio-editing software Audacity.

Procedure   The procedure for Experiment 3 was identical to Experiment 2, although participants were now compensated ca. $6.50 in Experiment 3 for the 20–30-minute task.[17]

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16 We thank the anonymous reviewers for raising this issue and the editor for providing us with the range of tests described here.

17 We decided to raise payment from £4.00 in Experiment 2 to £5.00 in Experiment 3 (the Prolific interface uses British pounds, which we converted into US dollars for presentational purposes above). We did so after becoming aware of issues related to unpaid work on crowdsourcing platforms given
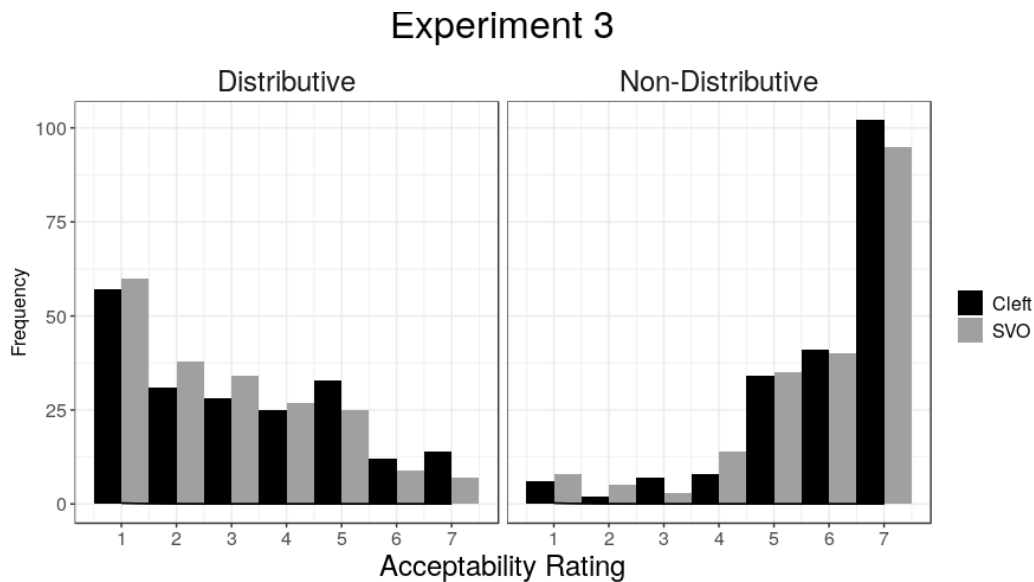
Experiment 3

Figure 3   Acceptability ratings (7-point scale: 1 '*unacceptable*' – 7 '*acceptable*')
shown as histograms for Experiment 3 (auditory, mixed predicates only).

3.3.2   Results

As seen in the histogram in Figure 3 for Experiment 3, we find the same general
division of acceptability ratings as in Experiment 2: in non-distributive contexts
the percentage of acceptable '5'–'7' ratings is 89% (177/200) for clefts and 85%
(170/200) for SVO sentences, with a majority of judgments at '6'–'7'; cf. about
8% '1'–'3' ratings for clefts (15/200) and SVO sentences (16/200). By comparison,
the percentage of less acceptable '1'–'3' ratings in distributive contexts was 58%
(116/200) for clefts and 66% (132/200) for SVO sentences; cf. '5'–'7' ratings at
30% (59/200) for clefts and 21% (41/200) for SVO sentences.

As before, we fit a Bayesian ordinal mixed-effect logistic regression model with
sum contrasts for *Sentence* (CLEFT –1, SVO 1) and *Context* (DISTRIBUTIVE –1,
NON-DISTRIBUTIVE 1). Experiment 3 replicated the results of the previous two
experiments. We found a highly positive coefficient estimate for *Context* ($\hat{\beta}$ = 1.54;
95% CrI: 1.23, 1.87), with participants judging sentences in distributive context as
less acceptable than sentences in non-distributive contexts, and this effect was robust.
Moreover, there was a reliable negative effect of *Sentence* ($\hat{\beta}$ = –0.12; 95% CrI:

that participants must "log in to the site, answer a plethora of screening questions, locate a survey for
which one is qualified" before they may begin the task, as described in the report on fair pay in digital
labor platforms from the United Nation's *International Labour Organization* (Berg et al. 2018: p. 53).

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–0.24, –0.01), with SVO sentences judged as slightly less acceptable than *it*-clefts. However, we again failed to find any evidence of an interaction of *Context* x *Sentence* ($\hat{\beta}$ = 0.04; 95% CrI: –0.07, 0.15).

3.4   Interim discussion

To sum up all three studies: The results of Experiment 2 and Experiment 3 replicate statistically the results of Experiment 1. Moreover, by using auditory stimuli (Experiments 2 and 3) as well as having mixed-predicates only (Experiment 3) the results became ever more clear: there was a reliable and robust effect of predicate interpretation, in that contexts triggering a distributive interpretation had lower rates of acceptability than contexts triggering a non-distributive interpretation. Finally, no indication of an interaction with sentence type was found.

As an anonymous reviewer pointed out, while the results of Experiment 3 indeed constitute good evidence against the homogeneity approach, the results of Experiment 1 and Experiment 2 potentially remain puzzling due to the use of lexically distributive predicts ("potentially" since mixed predicates were also used). The puzzle is due to the possible entailment relation with truly distributive predicates even with a spatio-temporally contiguous, communal, or coordinated interpretation, as discussed in Section 3.1 under "Materials" (see, in particular, Footnote 12). For a series of sentences similar to the one used here, Renans (2016a,b) showed that for *nì*-clefts in Ga (Kwa), an under-researched language spoken in Ghana, distributive predicates, such as *to give birth*, can be reinterpreted in a non-distributive manner as a rescue strategy. For instance, example (33) is claimed to be unacceptable — unless Kofi and Emmanuel are twins (Renans 2016a: Fn. 43).

(33)   #Jèèè Kòfí nì   Màríâ fɔ́.   È-fɔ́   Kòfí kɛ̀ Emmanuel.
       NEG Kofi PRT Maria give.birth 3SG-give.birth Kofi and Emmanuel
       '*It's not Kofi who Maria gave birth to. She gave birth to Kofi and Emmanuel.*'   [ex. (114) in Renans 2016a]

Along these lines, we had assumed that coercing a non-distributive interpretation of an otherwise lexically distributive predicate in the first two experiments would result in no entailment, for instance, between a sentence such as '*Maria have birth to Jacob and Ryan*' and the sentence '*Maria gave birth to Ryan*', in cases when the predicate *to give birth* is understood as applying to twins. Saying that, the more robust results in Experiment 3 could be due to the fact that only mixed predicates were used, unlike in Experiments 1 and 2, in which both mixed and lexically distributive predicates were used. On the other hand, if for truly distributive predicates an entailment relation remains despite obtaining a non-distributive interpretation (spatio-temporally contiguous, etc.), then the results of Experiment 1 and Experiment 2 reported here

are potentially unexpected for both homogeneity and the alternative-based account, an interesting issue we leave for future research.

As in Experiment 2, we found an effect of sentence type in Experiment 3: non-cleft SVO sentences were judged as slightly worse than *it*-clefts overall. Although a discussion on the discourse conditions of clefts is beyond the scope of this paper, this finding appears to be in line with several claims found in the literature: it has been argued that clefts encode a stronger degree of contrastiveness or contrariness than their canonical non-cleft counterparts (Byram-Washburn et al. 2013, Destruel & Velleman 2014, Destruel et al. 2015, 2017). In this light, since the series of sentences tested here had a strong contrastive flavor, it is unsurprising that participants found clefts to be (at least slightly) better than SVO sentences.

In sum, the results of the three experiments reported here pose a direct challenge for the homogeneity accounts of cleft exhaustivity. For the series of sentences '*It's not α that did P. α and β did P.*' the homogeneity approach predicts *it*-clefts to be equally unacceptable under both a distributive and a non-distributive interpretation, contrary to what we found.[18] Furthermore, we found no evidence of a difference between *it*-clefts and SVO sentences in distributive and non-distributive contexts, a finding which is consistent with the alternative-based approach.

4   Discussion

The results reported here suggest that the series of sentences '*It's not α that did P. α and β did P.*' is more acceptable in contexts triggering non-distributive interpretations than in contexts triggering distributive interpretations. Although the literature has noted that intuitions for such sentences are quite subtle — to the extent that Velleman et al. (2012: p. 455) explicitly state "further empirical evidence [. . .] would

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18 It was suggested by an anonymous reviewer that the experimental data from Experiments 1 through 3 can be accounted for under Büring & Križ's (2013) account of homogeneity if we assume that in non-distributive contexts — but not in distributive ones — participants interpreted the first sentence distributively and the second one non-distributively. The reviewer suggested that, in that case, a series of sentences such as '*It wasn't Kimberly who did the dishes. Kimberly and Helen did the dishes.*' would turn out to be true and thus acceptable. This, in turn, could explain why sentences in non-distributive contexts were rated better than the same sentences in distributive contexts. We can see, however, a couple of problems with this approach. First, it is unclear why participants would interpret one and the same predicate once distributively and once non-distributively in a context that specifies for a non-distributive interpretation of the predicate. Second, even if the first sentence is interpreted distributively, and hence the assertion is true (i.e., Kimberly alone did not do the dishes), under Büring & Križ's (2013) account it still gives rise to the presupposition that Kimberly is not a proper mereological part of the sum of people who did the dishes, which clashes with the second sentence stating that Kimberly *is* a proper mereological part of the sum of people who did the dishes. Thus, this series of sentences is predicted to be unacceptable in the end. We thank the reviewer for asking us for clarifications on this issue.

be helpful" — our findings suggest that the differences in interpretation are robust: the effect was replicated across three studies, using various modalities (written vs. auditory) and predicates (Experiment 1 & 2 vs. Experiment 3).

Although these results are a challenge for the homogeneity approach, there is one issue that remains to be addressed: the role of negation.[19] Throughout the discussion, we have assumed that the negation in the experimental items is truth-conditional negation; that is, that it targets the asserted meaning component. At the same time, however, Büring & Križ (2013: Fn. 1) and Križ (2017: Fn. 1) — following Horn (1981, 1985, 1989) — admit that the series of sentences '*It's not α that did P. α and β did P.*' can sometimes be accepted if the negation in the first sentence is not a truth-conditional negation but a metalinguistic negation. We would like to discuss this issue in detail here.

It has been observed in the literature that in some cases negation does not target the assertion but rather some other non-asserted meaning component of a sentence (see, for example, Karttunen & Peters 1979, Horn 1985, 1989, Guerts 1998). Consider, for instance, example (34).

(34)   The king of France is not bald.

      a.   PRESUPPOSITION: *there is a king of France*
      b.   ASSERTION: *the king of France is not bald*

The sentence in (34) can obtain either an interpretation in which the presupposition projects and only the assertion is negated, as in (35a), or an interpretation in which both the presupposition and the assertion are negated, as in (35b). One way of formalizing this is by referring to a global vs. local accommodation of the presupposition; see, e.g., Beaver & Zeevat 2007, von Fintel 2008, Romoli & Sauerland 2017. Concretely, (35a) illustrates when the presupposition is accommodated globally, i.e., at the sentential level. On the other hand, (35b) illustrates when the presupposition is accommodated locally, under the scope of negation.

(35)   a.   There is a king of France and he is not bald.   (*global acc.*)
      b.   There is no king of France and he is not bald.   (*local acc.*)

Regarding clefts, Horn (1989) claims that examples such as (36a) and (36b) are acceptable with metalinguistic negation, which targets the non-asserted inferences that Mary kissed nobody other than John and ate nothing other than pizza, respectively.[20]

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19 We thank the anonymous reviewer who pushed us to discuss this issue in detail.

20 Note, however, that in light of the results of our three experiments, the empirical generalizations provided in Horn (1989) are not quite sufficient. Yes, (36a) and (36b) are acceptable, but only if the distributive predicates *to kiss* and *to eat* are interpreted in a non-distributive manner.

(36)   a.   It wasn't John that Mary kissed — it was John and Bill.
         b.   It wasn't a pizza that Mary ate — it was a pizza, a calzone, and a side
                of ziti.   [exs. (46c)–(46d) in Horn 1989]

Now, the crucial point here is that this account can only work if clefts give rise to at least two meaning components — an asserted and non-asserted meaning — which the (metalinguistic) negation can target. As discussed in Sections 2.2 and 2.3, it is indeed the case that there are multiple meaning components in the alternative-based approach to cleft exhaustivity, but, crucially, not in the homogeneity approach. In Križ's (2017) formulation, homogeneity is neither a presupposition nor an implicature, but a way of capturing the trivalent logic characterizing the truth-conditions of sentences with homogeneous predicates. Since homogeneity is not modelled as another layer of meaning in clefts (e.g., it is neither a presupposition nor an implicature), the account of Horn (1989) is difficult to applicate here.

One way of doing this was suggested to us by an anonymous reviewer. The reviewer proposed that the metalinguistic negation in the cleft structure in (36a) may not be a negation of the cleft in (37), but its non-cleft SVO counterpart in (38) with focus on John — which gives rise to the implicature that Mary kissed John and nobody else, shown in (38a). The role of the metalinguistic negation in the cleft in that case would be to cancel this implicature, shown in (38b) (cf. Horn 1989: §6.6).

(37)   It was John that Mary kissed.

(38)   Mary kissed [John]$_F$.
         a.   (*implicature*) Mary kissed only John.
         b.   (*metalinguistic negation*) It is not the case that Mary kissed only John.

We share the reviewer's worry, though, that even if the metalinguistic negation is applicable to these cases, it still cannot account for the distinction between distributive vs. non-distributive contexts found in all three experiments.

By contrast, homogeneity is in fact modeled as another layer of meaning in Büring & Križ's (2013) formulation, but Križ (2017: p. 18) rejects this proposal, stating: "[Büring & Križ (2013)] say explicitly that they [model homogeneity as a presupposition] 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 [. . .]". Nevertheless, keeping the formulation as in Büring & Križ 2013 instead and treating homogeneity as a presupposition would allow one to adopt Horn's (1989) analysis of metalinguistic negation for clefts, potentially accounting for our results while maintaining (a version of) the homogeneity approach. As Križ (2017: §4.3) points out, however, this formulation is ill-defined

for complex sentences such as clefts with definite descriptions in pivot position, for which reason Križ proposed an update of Büring & Križ's (2013) account.[21]

Another possibility is that metalinguistic negation signals instead that the wrong form was used while keeping the assertion intact. This would be similar to the correction of the pronunciation in (39), which Krifka (2008: p. 248) refers to as *expression focus*.

(39)   John didn't come to BERlin. He came to BerLIN.

In the case of (39), the metalinguistic negation does not negate the assertion that John came to Berlin but the fact that the interlocutor wrongly pronounced the word *Berlin*. If this type of metalinguistic negation is what one finds in (40a), then the negation in the first sentence should be targeting the form of the sentence: it should communicate something along the lines of "the sentence giving rise to homogeneity should not be used here". In that case, one can paraphrase (40a) as in (40b).

(40)   a.   It wasn't Kimberly who did the dishes. Kimberly and Helen did the dishes.
         b.   The sentence giving rise to homogeneity should not be used here. Kimberly and Helen did the dishes.

It remains unclear, however, why the (distributive vs. non-distributive) interpretation of the predicate should influence the acceptability of second sentence in (40b). In light of the above, even if the negation in our experiments was interpreted as a form of expression focus under metalinguistic negation, the results presented here are still problematic for the homogeneity approach.

Yet another possibility is to assume that the negation in our experiments was not a truth-conditional negation that swaps truth and falsity leaving undefinedness intact, but a negation that targets the third, undefined value. In fact, one proposal in the literature in which negation targets undefinedness in a trivalent logic comes from

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21 There is another conceptual problem with Büring & Križ's (2013) formulation of homogeneity which prevents us from adopting it, namely the treatment of the assertion. As they write in their paper, Büring & Križ (2013: p. 10) predict the sentence '*It was Bill who carried the piano.*' to suffer from a presupposition failure (in Križ's (2017) terms, undefinedness) in the situation in which Bill and Fred carried the piano and neither of them did it alone. However, if the assertion of the cleft is *Bill* $\in$ ⟦*carry the piano*⟧, then the assertion is false. The problem is that the sentence cannot be undefined (i.e., neither true nor false) when its assertion is false. If, on the other hand, the assertion is that $P \in \oplus$⟦*carry the piano*⟧, then the assertion is true and the sentence turns out to be neither true nor false, as claimed by Büring & Križ (2013). However, if this is so then even under a metalinguistic analysis of negation in our experimental studies no difference in the acceptability of distributive vs. non-distributive predicates is expected; see Renans 2016a for discussion.

Spector & Sudo (2017).[22] Under their account, the so-called *weak* negation maps the third undefined value # in (41) to truth in (42).

(41) $[\![\phi]\!]$ =
    true iff $[\![\phi]\!] = 1$
    undef iff $[\![\phi]\!] = \#$
    false iff $[\![\phi]\!] = 0$

(42) Weak Negation $[\![\sim \phi]\!]$ =
    true iff $[\![\phi]\!] = 0$ or $[\![\phi]\!] = \#$
    false otherwise

[based on (25) in Spector & Sudo 2017]

Now consider the truth conditions of (6) according to Križ (2017), repeated in (43) for the reader.

(43) It was Kimberly who did the dishes.
    true iff Kimberly is identical to the mereological sum of people who did the dishes
        ≈ *iff Kimberly and only Kimberly did the dishes*
    false iff Kimberly does not overlap with the mereological sum of people who did the dishes
        ≈ *iff Kimberly did not participate in doing the dishes*
    undef otherwise
        ≈ *iff Kimberly and somebody else did the dishes*

Under a weak negation operator, the cleft in (43) has the truth-conditions in (44).

(44) It wasn't Kimberly who did the dishes. Kimberly and Helen did the dishes.
    true iff Kimberly does not overlap with the mereological sum of people who the dishes, or — as in our contexts — Kimberly is properly contained in the mereological sum of people who did the dishes
        ≈ *iff Kimberly did not participate in doing the dishes or Kimberly and somebody else did the dishes*
    false iff Kimberly is identical to the mereological sum of people who did the dishes
        ≈ *iff Kimberly and only Kimberly did the dishes*

Thus, whether with distributively or non-distributively interpreted predicates, (44) is true in our experimental contexts, since Kimberly is properly contained in the mereological sum of dish-washers including Kimberly and Helen. Therefore, again no difference in the acceptability of sentences with distributively and non-distributively interpreted predicates is predicted, contrary to what we found.

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22 Note that Spector & Sudo's (2017) account was particular for negation in a different domain, i.e., in the exclusion of alternatives by an exhaustivity operator when an implicature arises in a presupposition.

A final possibility is to assume Križ's (2016) pragmatic principle, which maps the undefined third truth-value to truth or falsity if the context makes the undefined sentence *true* or *false enough*, respectively. Under this account, however, it remains unclear why with distributively interpreted predicates *it*-clefts should be interpreted as *false enough* but with non-distributively interpreted predicates as *true enough*, if for both types of predicates the same type of analysis in terms of mereological terms is proposed.

To sum up, even by treating the negation in our experiments as a metalinguistic or weak negation targeting the third, undefined value, several challenges for the homogeneity account remain, challanges which are not faced by the alternative-based approach.

5   Conclusion

In this paper, we reported the results of three experiments which found that the acceptability of both *it*-clefts and their SVO counterparts in the series '*It's not α that did P. α and β did P.*' were reliably influenced by the distributive vs. non-distributive interpretation of the predicate. These results are consistent with the alternative-based approach to *it*-cleft exhaustivity, such as that in Velleman et al. 2012, since the acceptability of clefts — similar to SVO sentences — is predicted to differ across distributively vs. non-distributively interpreted predicates. On the other hand, the results pose challenges to the homogeneity approach, which predicts no differences for *it*-clefts across distributively and non-distributively interpreted predicates.

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A Instruction to the participants

Please note that this is not a grammar test! We are not interested in judgments based on such things as "I learned in school that this is correct English, and therefore this sentence must be acceptable." For us it is very important that every answer is based on your own intuition about the acceptability of the sentences in context. There are no right or wrong responses. Keep in mind that it does not help us if you ask someone else for his or her judgment. We are only interested in your opinion.

Even if many sentences may appear to be similar, it is very important that you judge each sentence on its own without letting prior responses influence you. It is possible that some sentences which do not sound acceptable can be improved with a small change. Please do not "correct" the sentences. Each sentence was written that way in order to investigate a specific aspect of English. It is enough that you express your opinion about the acceptability of the sentences as they appear in context without any modifications made to them.

B Target items: Experiment 1 and Experiment 2

In this section we provide a full list of the written stimuli as in Experiment 1, which is broken down into two subsections: Appendix B.1 presents the 20 target items with an episodic interpretation, and Appendix B.2 presents the 20 target items with a habitual interpretation. Note that only target items with an episodic interpretation were used in Experiment 2 and Experiment 3.

B.1 Episodic (Experiments 1 & 2)

As discussed for Experiment 2 in Section 3.2.1 under "Materials", for the auditory version of the experiments the order of conjuncts in the second clause for the factor *Sentence* was reversed for the odd-numbered episodic target items listed below (i.e., 1, 3, 5, 7, 9, 11, 13, 15, 17, 19). For example, for the second sentence in item 01 the written stimuli had the order *She gave birth to **Jacob and Ryan***, shown below, whereas the auditory stimuli had the reverse order *She gave birth to **Ryan and Jacob***, not shown here. This was done in order to keep the prosodic contours consistent across the items. In every other respect the stimuli were identical. For the odd-numbered episodic target items, by contrast, the order of conjuncts was unchanged across the experiments. Since reconstructing the order of conjuncts for

the auditory stimuli is straightforward, we only present the written version of the items here.

01 <u>Context</u>

  Distributive: Jacob and Ryan are Maria's children. Jacob is fifteen and Ryan is two.
  Non-Distributive: Jacob and Ryan are twins, sons of Maria.
  <u>Sentence</u>
  it-*Cleft*: It's not Ryan Maria gave birth to. She gave birth to Jacob and Ryan.
  SVO: Maria didn't give birth to Ryan. She gave birth to Jacob and Ryan.

02 <u>Context</u>

  Distributive: Marc died in a car accident last year, and Anthony, a fireman, died last week while rescuing people.
  Non-Distributive: Marc and Anthony were firemen. They died last week while rescuing people.
  <u>Sentence</u>
  it-*Cleft*: It wasn't Marc who died. Marc and Anthony died.
  SVO: Marc didn't die. Marc and Anthony died.

03 <u>Context</u>

  Distributive: Sophia and Kathrine share a car. Sophia drove the car on Monday and Kathrine drove the car on Friday.
  Non-Distributive: Sophia and Kathrine tested a new invention of the automotive industry: a car that is driven by two people simultaneously.
  <u>Sentence</u>
  it-*Cleft*: It wasn't Sophia who drove the car. Kathrine and Sophia drove the car.
  SVO: Sophia didn't drive the car. Kathrine and Sophia drove the car.

04 <u>Context</u>

  Distributive: Emma and Samuel are causing a lot of trouble! Last week, Emma swallowed a coin on Monday and Samuel swallowed a coin on Wednesday.
  Non-Distributive: Emma and Samuel are causing a lot of trouble! Last week, they miraculously managed to break a coin and swallow it (each one half).
  <u>Sentence</u>
  it-*Cleft*: It wasn't Emma who swallowed a coin. Emma and Samuel swallowed a coin.
  SVO: Emma didn't swallow a coin. Emma and Samuel swallowed a coin.

05 <u>Context</u>

  Distributive: Isabella is a monogamist. She married her first husband, James, in 1985 and her second husband, Tyler, in 2001.
  Non-Distributive: Isabella is a polygamist. She married her husbands, James and Tyler, in a small wedding ceremony in July 2015.
  <u>Sentence</u>
  it-*Cleft*: It wasn't James Isabella married. She married Tyler and James.
  SVO: Isabella didn't marry James. She married Tyler and James.

06 <u>Context</u>

Distributive: Madison and Abigail are marathon runners. Madison won the New York marathon in 2001 and Abigail won the Boston marathon in 2005.

Non-Distributive: Madison and Abigail are marathon runners. Last year, they both ran the New York marathon and they passed the finish line at exactly the same time.

SENTENCE

it-*Cleft*: It wasn't Madison who won a marathon. Madison and Abigail won a marathon.

SVO: Madison didn't win a marathon. Madison and Abigail won a marathon.

07   CONTEXT

Distributive: Chloe is an astronomer. In 2000, she was writing a paper on the chemical reactions on the sun's surface, so she observed the sun. Recently, she was interested in the geology of the moon, so she observed the moon.

Non-Distributive: Chloe is an astronomer. She tried to answer the question about what happens in the atmosphere when both the sun and the moon are visible at the same time. For this reason she made several observations of this phenomenon.

SENTENCE

it-*Cleft*: It wasn't the sun Chloe observed. She observed the moon and the sun.

SVO: Chloe didn't observe the sun. She observed the moon and the sun.

08   CONTEXT

Distributive: Owen is not a lucky man. He proposed to Alice and he was rejected. So he proposed to Linda and he was rejected as well.

Non-Distributive: Owen thought he would be the happiest man in the world if he could marry both Alice and Linda. He wanted to give it a try and one winter evening he popped the question to both of them.

SENTENCE

it-*Cleft*: It wasn't Alice Owen proposed to. He proposed to Alice and Linda.

SVO: Owen didn't propose to Alice. He proposed to Alice and Linda.

09   CONTEXT

Distributive: Kathy and Daniel are judges. In 1995 Kathy sentenced Bob to two years in prison and in 2003 Daniel sentenced Bob to three years in prison.

Non-Distributive: Kathy and Daniel are judges. Last autumn, they were judges on the case of Bob, a drug-dealer. They sentenced him to 10 years in prison.

SENTENCE

it-*Cleft*: It wasn't Kathy who sentenced Bob to prison. Daniel and Kathy sentenced Bob to prison.

SVO: Kathy didn't sentence Bob to prison. Daniel and Kathy sentenced Bob to prison.

10   CONTEXT

Distributive: Carlos and Andrea like biking in a nearby forest. However, they have never seen each other there! Last week, Carlos biked on Monday and Andrea biked on Wednesday.

Non-Distributive: Carlos and Andrea like biking. They own a tandem bike and they use it all the time! Last week, they biked in a nearby forest together.

SENTENCE

it-*Cleft*: It wasn't Carlos who biked. Carlos and Andrea biked.

SVO: Carlos didn't bike. Carlos and Andrea biked.

11   CONTEXT

Distributive: Carter and Mason are a couple. Ava invited Carter to her birthday party and Mason to her graduation party.

Non-Distributive: Carter and Mason are a couple. Ava invited them to her birthday party.

SENTENCE

it-*Cleft*: It wasn't Carter she invited. She invited Mason and Carter.

SVO: She didn't invite Carter. She invited Mason and Carter.

12   CONTEXT

Distributive: Mia went to a party on Monday and she drank gin and tonic. Harper went to a party on Tuesday and she also drank gin and tonic.

Non-Distributive: Mia and Harper went to a party last night. They did not have too much money so they just shared one gin and tonic.

SENTENCE

it-*Cleft*: It wasn't Mia who drank gin and tonic. Mia and Harper drank gin and tonic.

SVO: Mia didn't drink gin and tonic. Mia and Harper drank gin and tonic.

13   CONTEXT

Distributive: Zoe and Emily are sisters. Zoe visited their grandmother on Wednesday and Emily visited her on Friday.

Non-Distributive: Zoe and Emily are sisters. On Wednesday, they went to visit their grandmother together.

SENTENCE

it-*Cleft*: It wasn't Zoe who visited their grandmother. Emily and Zoe visited her.

SVO: Zoe didn't visit their grandmother. Emily and Zoe visited her.

14   CONTEXT

Distributive: Lily and Ethan live together. Last week, Ethan cooked dinner on Tuesday and Lily cooked dinner on Friday.

Non-Distributive: Lily and Ethan live together. Last Friday, Ethan and Lily cooked dinner together.

SENTENCE

it-*Cleft*: It wasn't Ethan who cooked dinner. Ethan and Lily cooked dinner.

SVO: Ethan didn't cook dinner. Ethan and Lily cooked dinner.

15   CONTEXT

Distributive: There was a song competition in Sarah's school. Sarah sang a song on Monday and William sang a song on Wednesday.

Non-Distributive: There was a song competition in Sarah's school. Sarah and her friend William sang a song together.

SENTENCE

it-*Cleft*: It wasn't Sarah who sang a song. William and Sarah sang a song.

SVO: Sarah didn't sing a song. William and Sarah sang a song.

16   CONTEXT

Distributive: Charlotte and Ella are arranging furniture in their new apartment. On Monday Charlotte moved a piano from the bedroom to the living room. On Friday, Ella moved the piano back to the bedroom.

Non-Distributive: Charlotte and Ella are arranging furniture in their new apartment. They are really happy now because when they combined forces they managed to move their heavy piano from the bedroom to the living room.

SENTENCE

it-*Cleft*: It wasn't Charlotte who moved the piano. Charlotte and Ella moved the piano.

SVO: Charlotte didn't move the piano. Charlotte and Ella moved the piano.

17 CONTEXT

Distributive: Olivia and Victoria are colleagues, but they never co-authored a paper. Olivia submitted a new paper in June and Victoria submitted a new paper in July.

Non-Distributive: Olivia and Victoria are colleagues. Recently, they co-authored a paper.

SENTENCE

it-*Cleft*: It wasn't Olivia who wrote a paper. Victoria and Olivia wrote a paper.

SVO: Olivia didn't write a paper. Victoria and Olivia wrote a paper.

18 CONTEXT

Distributive: Noah and Henry love sailing but they never do it together. Last week, Noah sailed on Saturday and Henry sailed on Sunday.

Non-Distributive: Noah and Henry love sailing together. Last Saturday they sailed together again.

SENTENCE

it-*Cleft*: It wasn't Noah who sailed. Noah and Henry sailed.

SVO: Noah didn't sail. Noah and Henry sailed.

19 CONTEXT

Distributive: Anne and Benjamin are wonderful speakers. Anne gave a great speech at Benjamin's wedding in May and Benjamin gave a great speech at Anne's wedding in August.

Non-Distributive: Anne and Benjamin are wonderful speakers. They gave an amazing speech at their best friend's wedding together.

SENTENCE

it-*Cleft*: It wasn't Anne who gave a speech. Benjamin and Anne gave a speech.

SVO: Anne didn't give a speech. Benjamin and Anne gave a speech.

20 CONTEXT

Distributive: Kevin and Susanne feel really adult now. Two months ago Kevin bought an apartment and last month Susanne bought an apartment.

Non-Distributive: Kevin and Susanne feel really adult now. Two months ago they bought an apartment together.

SENTENCE

it-*Cleft*: It wasn't Kevin who bought an apartment. Kevin and Susanne bought an apartment.

SVO: Kevin didn't buy an apartment. Kevin and Susanne bought an apartment.

B.2 Habitual (Experiment 1 only)

01 CONTEXT

Distributive: Matthew and Nicholas love swimming. Matthew swims on Mondays and Nicholas swims on Tuesdays.

Non-Distributive: Matthew and Nicholas love swimming. Every Monday they go swimming together.

SENTENCE

it-*Cleft*: It's not Matthew who swims. Matthew and Nicholas swim.

SVO: Matthew doesn't swim. Matthew and Nicholas swim.

02   CONTEXT

Distributive: Patricia plays computer games on the weekends and Martha plays computer games during the week.

Non-Distributive: Every Saturday Patricia and Martha play computer games together.

SENTENCE

it-*Cleft*: It's not Patricia who plays computer games. Martha and Patricia play computer games.

SVO: Patricia does not play computer games. Martha and Patricia play computer games.

03   CONTEXT

Distributive: Dorothy and Richard live together. Dorothy prepares breakfast from Monday to Wednesday and Richard prepares breakfast from Thursday to Sunday.

Non-Distributive: Dorothy and Richard are such a sweet couple! They always prepare their breakfast together.

SENTENCE

it-*Cleft*: It's not Dorothy who prepares breakfast. Dorothy and Richard prepare breakfast.

SVO: Dorothy doesn't prepare breakfast. Dorothy and Richard prepare breakfast.

04   CONTEXT

Distributive: Steve and Carl are good friends but they never go shopping together. Steve loves shopping on Saturdays, but Carl only goes shopping on Mondays.

Non-Distributive: Steve and Carl are good friends and they always go shopping together.

SENTENCE

it-*Cleft*: It's not Steve who goes shopping. Carl and Steve go shopping.

SVO: Steve doesn't go shopping. Carl and Steve go shopping.

05   CONTEXT

Distributive: Scott and Betty are swing dancers, but they never dance together! Whereas Scott dances on Mondays and Tuesday, Betty dances only on Sundays.

Non-Distributive: Scott and Betty are swing dancers and they always dance together.

SENTENCE

it-*Cleft*: It's not Betty who dances. Betty and Scott dance.

SVO: Betty doesn't dance. Betty and Scott dance.

06   CONTEXT

Distributive: Cynthia and Nancy are birdwatchers. Cynthia always watches birds in July and Nina in October.

Non-Distributive: Cynthia and Nancy are birdwatchers and they always do it together.

SENTENCE

it-*Cleft*: It's not Cynthia who watches birds. Nina and Cynthia watch birds.

SVO: Cynthia doesn't watch birds. Nina and Cynthia watch birds.

07 CONTEXT

Distributive: Helen and Kimberly live together. Whenever Helen cooks, Kimberly does the dishes and whenever Kimberly cooks, Helen does the dishes.

Non-Distributive: Helen and Kimberly live together. They have one rule: it doesn't matter who cooks, they always do the dishes together.

SENTENCE

it-*Cleft*: It's not Kimberly who does the dishes. Kimberly and Helen do the dishes.

SVO: Kimberly doesn't do the dishes. Kimberly and Helen do the dishes.

08 CONTEXT

Distributive: Laura and Brian are preparing for their final exams. Whereas Laura always studies in the mornings and keeps her afternoons free, Brian sleeps late and studies in the evenings.

Non-Distributive: Laura and Brian are preparing for their final exams. People think they are crazy because they always study together.

SENTENCE

it-*Cleft*: It's not Laura who studies. Brian and Laura study.

SVO: Laura doesn't study. Brian and Laura study.

09 CONTEXT

Distributive: Larry and Shirley like basketball. Larry plays basketball with his friends just after school and Shirley plays with her sisters on Sundays.

Non-Distributive: Larry and Shirley like basketball. They always play it together.

SENTENCE

it-*Cleft*: It's not Larry who plays basketball. Larry and Shirley play basketball.

SVO: Larry doesn't play basketball. Larry and Shirley play basketball.

10 CONTEXT

Distributive: Once a year Nathalie and Chris go surfing on holidays. Nathalie surfs in Australia in March and Chris surfs in Hawaii in June.

Non-Distributive: Once a year Nathalie and Chris go surfing on holidays together.

SENTENCE

it-*Cleft*: It's not Nathalie who surfs. Chris and Nathalie surf.

SVO: Nathalie doesn't surf. Chris and Nathalie surf.

11 CONTEXT

Distributive: Mike and Colin are travelers. However, they have never traveled together.

Non-Distributive: Mike and Colin are travelers who always travel together.

SENTENCE

it-*Cleft*: It's not Mike who travels. Mike and Colin travel.

SVO: Mike doesn't travel. Mike and Colin travel.

12 CONTEXT

Distributive: Doris and Eric run IT companies. Doris sells computers in California and Eric sells computers in Washington D.C.

Non-Distributive: Doris and Eric run an IT company together which sells computers in California.

<u>Sentence</u>

it-Cleft: It's not Doris who sells computers. Eric and Doris sell computers.

SVO: Doris doesn't sell computers. Eric and Doris sell computers.

13   <u>Context</u>

Distributive: Peter and Sandra are film producers. Whereas Peter produces documentaries, Sandra produces action films, so they have never produced anything together.

Non-Distributive: Peter and Sandra produce films together.

<u>Sentence</u>

it-Cleft: It's not Peter who produces films. Peter and Sandra produce films.

SVO: Peter doesn't produce films. Peter and Sandra produce films.

14   <u>Context</u>

Distributive: Lisa and Willie are mechanics. They don't like each other so they always work alone.

Non-Distributive: Lisa and Willie are mechanics. They are a great team: together they can repair anything! They never work alone.

<u>Sentence</u>

it-Cleft: It's not Lisa who repairs washing machines. Willie and Lisa repair washing machines.

SVO: Lisa doesn't repair washing machines. Willie and Lisa repair washing machines.

15   <u>Context</u>

Distributive: Lawrence and Bill are rivals. They are always quarreling over who bakes the best cupcakes in town.

Non-Distributive: Lawrence and Bill are wonderful. Together they bake the best cupcakes in town.

<u>Sentence</u>

it-Cleft: It's not Lawrence who bakes cupcakes. Lawrence and Bill bake cupcakes.

SVO: Lawrence doesn't bake cupcakes. Lawrence and Bill bake cupcakes.

16   <u>Context</u>

Distributive: Nina and Jane are biologists. Nina conducts experiments on frogs and Jane conducts experiments on birds, so they have never cooperated.

Non-Distributive: Nina and Jane are biologists who conduct experiments on frogs together.

<u>Sentence</u>

it-Cleft: It's not Nina who conducts experiments. Jane and Nina conduct experiments.

SVO: Nina doesn't conduct experiments. Jane and Nina conduct experiments.

17   <u>Context</u>

Distributive: Carol and Jeffrey are working parents. Carol brings the children to kindergarten from Monday to Wednesday and Jeffrey from Thursday to Friday.

Non-Distributive: Carol and Jeffrey are working parents, but nevertheless they always bring their children to kindergarten together.

<u>Sentence</u>

it-*Cleft*: It's not Carol who brings the children to kindergarten. Carol and Jeffrey bring the children to kindergarten.

SVO: Carol doesn't bring the children to kindergarten. Carol and Jeffrey bring the children to kindergarten.

18   <u>CONTEXT</u>

Distributive: Louis and Martin have a beautiful garden. Louis works in the garden on Tuesdays and Thursdays and Martin on Fridays and Saturdays.

Non-Distributive: Louis and Martin have a beautiful garden. On the weekends they always work in their garden together.

<u>SENTENCE</u>

it-*Cleft*: It's not Louis who works in the garden. Martin and Louis work in the garden.

SVO: Louis doesn't work in the garden. Martin and Louis work in the garden.

19   <u>CONTEXT</u>

Distributive: Albert and Gloria are burglars. Albert robs banks in New York and Gloria robs banks in Los Angeles.

Non-Distributive: Albert and Gloria are burglars. They always work by robbing banks together.

<u>SENTENCE</u>

it-*Cleft*: It's not Albert who robs banks. Albert and Gloria rob banks.

SVO: Albert doesn't rob banks. Albert and Gloria rob banks.

20   <u>CONTEXT</u>

Distributive: Ralph and Janice love taking baths. They bath regularly but they never do it together!

Non-Distributive: Ralph and Janice love taking baths. They bath regularly and they always do it together!

<u>SENTENCE</u>

it-*Cleft*: It's not Ralph who takes baths. Janice and Ralph take baths.

SVO: Ralph doesn't take baths. Janice and Ralph take baths.

C   Sample filler items

C.1   *wh*-Clefts

F01   [*wh*-cleft, +NEG, acceptable]

    a.   *Context:* Diana is spending her holidays in California and Gary is spending his holidays in Texas.

    b.   Where Diana and Gary are spending their holidays is not Canada. They're spending their holidays in the USA.

F02   [*wh*-cleft, +NEG, unacceptable]

    a.   *Context:* Tracy is interested in physics and Dale is interested in medieval literature.

    b.   What Tracy is interested in isn't medieval literature. She is interested in chemistry.

F03   [*wh*-cleft, –NEG, acceptable]

       a.   *Context:* Hazel and Randall are architects. Randall plans family homes and Hazel is specialized in skyscrapers.

       b.   What Randall plans is family homes.

F04   [*wh*-cleft, −NEG, unacceptable]

       a.   *Context:* Rosa isn't a good skier but she snowboards very well. Tom, on the other hand, is a great skier but is a very poor snowboarder.

       b.   What Rosa and Tom do best is snowboarding.

C.2   Expletive Sentences

F05   [expletive, +NEG, acceptable]

       a.   *Context:* Bradley went shopping on Monday and bought a new pair of sandals. Walter went shopping on Wednesday and also bought a new pair of sandals.

       b.   It's clear that Bradley and Walter didn't buy new ties. They bought new sandals.

F06   [expletive, +NEG, unacceptable]

       a.   *Context:* Kenneth and Brenda went to a toy shop with their parents and they could pick out whatever they wanted. Kenneth chose a toy car and Brenda chose a computer game.

       b.   It's obvious that Brenda didn't choose a doll. She chose a toy car.

F07   [expletive, −NEG, acceptable]

       a.   *Context:* George gave a radio interview in which he recommended two museums to visit: MoMA in New York and The Louvre in Paris.

       b.   It's obvious that George recommended MoMA and The Louvre.

F08   [expletive, −NEG, unacceptable]

       a.   *Context:* Lois is so British: she celebrates five o'clock tee and she never has coffee.

       b.   It's clear that Lois drinks coffee at 5pm.

C.3   *it*-Clefts/Definite Pseudoclefts

Context: Michael is on his favorite social network each and every day.

F09   It's a photo that Michael posted and he posted a video.

F10   It's a ransom note that Michael posted and he posted a video.

F11   The thing that Michael posted is a photo and he posted a video.

F12   The thing that Michael posted is a ransom note and he posted a video.

D   Target items: Experiment 3

01   see episodic target item 10 (auditory version)

02   see episodic target item 14 (auditory version)

03   see episodic target item 15 (auditory version)

04   see episodic target item 16 (auditory version)

05   see episodic target item 17 (auditory version)

06   see episodic target item 19 (auditory version)

07   see episodic target item 20 (auditory version)

08   CONTEXT

Distributive: Liam and Noah were helping their friend Anna move. They divided the work between them: Liam carried a wardrobe from Anna's old apartment to the truck and Noah carried it from the truck to Anna's new

Non-Distributive: Liam and Noah were helping their friend Anna move last weekend. Anna's wardrobe was so heavy that Liam and Noah had to carry it together. apartment.

CONTEXT

SENTENCE

it-*Cleft*: It wasn't Liam who carried the wardrobe. Liam and Noah carried the wardrobe.

SVO: Liam didn't carry the wardrobe. Liam and Noah carried the wardrobe.

09   CONTEXT

Distributive: Ava's car keeps breaking down and she would not be able to start the engine if not for her friends. Last Wednesday, James pushed the car and last Saturday Logan pushed the car.

Non-Distributive: Ava's car broke down last week and it had to be pushed. The car was so heavy that her two friends James and Logan had to push it.

SENTENCE

it-*Cleft*: It wasn't Logan who pushed the car. Logan and James pushed the car.

SVO: Logan didn't push the car. Logan and James pushed the car.

10   CONTEXT

Distributive: Isabella and Sophia are carpenters. Isabella built a beautiful table for her mother and Sophia built a table for her sister.

Non-Distributive: Isabella and Sophia are carpenters. Recently, they built a beautiful table together for their dining room.

SENTENCE

it-*Cleft*: It wasn't Isabella who built a table. Isabella and Sophia built a table.

SVO: Isabella didn't build a table. Isabella and Sophia built a table.

11   CONTEXT

Distributive: Mason and Elijah were betting who is stronger by lifting different objects. Mason lifted the fridge and then Elijah lifted the fridge.

Non-Distributive: Mason and Elijah were betting who is stronger by lifting different objects. None of them managed to lift the fridge alone but they were strong enough to lift it together.

SENTENCE

it-*Cleft*: It wasn't Elijah who lifted the fridge. Elijah and Mason lifted the fridge.

SVO: Elijah didn't lift the fridge. Elijah and Mason lifted the fridge.

12   CONTEXT

Distributive: Helen and Kimberly live together. On Saturday Kimberly did the dishes and yesterday Helen did the dishes.

Non-Distributive: Helen and Kimberly live together. Yesterday Helen cooked, but they did the dishes together.

SENTENCE

it-*Cleft*: It wasn't Kimberly who did the dishes. Kimberly and Helen did the dishes.

SVO: Kimberly didn't do the dishes. Kimberly and Helen did the dishes.

13   CONTEXT

Distributive: Albert and Gloria are burglars. Yesterday, Albert robbed a bank in New York and Gloria robbed a bank in Los Angeles.

Non-Distributive: Albert and Gloria are burglars. Yesterday, they robbed a bank together.

SENTENCE

it-*Cleft*: It wasn't Albert who robbed a bank. Albert and Gloria robbed a bank.

SVO: Albert didn't rob a bank. Albert and Gloria robbed a bank.

14   CONTEXT

Distributive: Jacob and Lucas are brothers and they love baking. Jacob baked a cake for their mother last Monday and Lucas baked a cake for their sister last Saturday.

Non-Distributive: Jacob and Lucas are brothers and they love baking together. Last Saturday they baked a birthday cake for their mother together.

SENTENCE

it-*Cleft*: It wasn't Lucas who baked a cake. Lucas and Jacob baked a cake.

SVO: Lucas didn't bake a cake. Lucas and Jacob baked a cake.

15   CONTEXT

Distributive: Mia and Henry are well organized with their household duties. Mia cleaned the garage last week and Henry cleaned the garage this week.

Non-Distributive: Mia and Henry hate their household duties so they always do them with each other. Last week, Mia and Henry cleaned the garage together.

SENTENCE

it-*Cleft*: It wasn't Mia who cleaned the garage. Mia and Henry cleaned the garage.

SVO: Mia didn't clean the garage. Mia and Henry cleaned the garage.

16   CONTEXT

Distributive: Abigail and Madison are talented math students. Yesterday, they solved on their own and independently from each other the very difficult equation their teacher gave them.

Non-Distributive: Abigail and Madison are talented math students. Yesterday, they joined forces and solved the very difficult equation their teacher gave them together.

SENTENCE

it-*Cleft*: It wasn't Madison who solved the equation. Madison and Abigail solved the equation.

SVO: Madison didn't solve the equation. Madison and Abigail solved the equation.

17   CONTEXT

Distributive: Lisa and Willie are mechanics. Last year Lisa repaired my father's car and this year Willie repaired my father's car.

Non-Distributive: Lisa and Willie are mechanics. Last year they repaired my father's car together.

SENTENCE

it-*Cleft*: It wasn't Lisa who repaired my father's car. Lisa and Willie repaired my father's car.

SVO: Lisa didn't repair my father's car. Lisa and Willie repaired my father's car.

18   CONTEXT

Distributive: Matt and Harper are tailors. Matt sew a summer dress for Alice in 2016 and Harper sew a summer dress for Alice in 2017.

Non-Distributive: Matt and Harper are tailors. Together, they sew a very beautiful summer dress for Alice.

SENTENCE

it-*Cleft*: It wasn't Harper who sew a summer dress for her. Harper and Matt sew a summer dress for her.

SVO: Harper didn't sew a summer dress for her. Harper and Matt sew a summer dress for her.

19   CONTEXT

Distributive: Michael and Amelia love making desserts but they never do it together. Michael made a dessert on Monday and Amelia on Wednesday.

Non-Distributive: Michael and Amelia love making desserts together. Last weekend, they prepared a really delicious dessert for their friend.

SENTENCE

it-*Cleft*: It wasn't Michael who made a dessert. Michael and Amelia made a dessert.

SVO: Michael didn't make a dessert. Michael and Amelia made a dessert.

20   CONTEXT

Distributive: Grace and David are street artists. Last week, Grace painted a mural in San Diego and David painted a mural in Seattle.

Non-Distributive: Grace and David are street artists. Last week, they painted a mural in San Diego together.

SENTENCE

it-*Cleft*: It wasn't David who painted a mural. David and Grace painted a mural.

SVO: David didn't paint a mural. David and Grace painted a mural.