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nà-Cleft (non-)exhaustivity: Variability in Akan

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This paper presents two experimental studies on the exhaustive inference associated with focus-background *nà*-clefts in Akan (among others, Boadi 1974; Duah 2015; Grubic & Renans & Duah 2019; Titov 2019), with a direct comparison to two recent experiments on German *es*-clefts employing an identical design (De Veaugh-Geiss et al. 2018). Despite the unforeseen response patterns in Akan in the incremental information-retrieval paradigm used, a post-hoc exploratory analysis reveals compelling parallels between the two languages. The results are compatible with a unified approach both (i) cross-linguistically between Akan and German; and (ii) cross-sententially between *nà*-clefts (*α* nà *P*, 'It is *α* who did *P*') and definite pseudoclefts, i.e., definite descriptions with identity statements (*Nipa no a P ne α*, 'The person who did *P* is *α*') (Boadi 1974; Ofori 2011). Participant variability in (non-)exhaustive interpretations is compatible with discourse pragmatic approaches to cleft exhaustivity (Pollard & Yasavul 2016; De Veaugh-Geiss et al. 2018; Titov 2019).

1 Introduction

Across numerous languages, bipartitional focus-background clefts of a form comparable to *It is* $[\alpha]_{focus}$ $[$*who did P*$]_{background}$ have been argued to give rise to at least three layers of meaning: (i) the truth-conditional assertion corresponding to the canonical form '*α did* P', (ii) the existence presupposition '*someone did* P', and (iii) an exhaustivity inference '*nobody other than α did* P'. Among these are sentences with the focus particle *nà* in Akan (among others, Ellis & Boadi 1969; Boadi 1974; Ofori 2011; Ameka 2010; Amfo 2010; Duah 2015; Pfeil & Genzel & Kügler 2015; Grubic & Renans & Duah 2019; Titov 2019). Consider example (1);[1] of particular importance here is the exhaustivity component in (iii).[2]

(1) Kodwo na ɔ-di-i adua no.
Kodwo FM 3.SG.SBJ.ANI-eat-PST beans DET
'*It was Kodwo who ate the beans.*'
[adapted from ex. (6) in Pfeil & Genzel & Kügler 2015]

(i) ⇝ Kodwo ate the beans. (canonical: *asserted*)

(ii) ⇝ Someone ate the beans. (existential: *presupposed*)

(iii) ⇝ Yaa, Kofi, Abena … did not eat the beans, i.e.,
nobody other than Kodwo ate the beans. (exhaustivity: *?*)

Although there is general agreement that focus-background cleft structures give rise to an exhaustive meaning, there remains no consensus regarding the nature of this inference: Is exhaustivity conventionally-coded as part of the cleft structure (Akan: Duah 2015; Grubic & Renans & Duah 2019; theoretical accounts: Velleman et al. 2012; Büring & Križ 2013; Križ 2015; 2017)? Or is exhaustivity a discourse-pragmatic phenomenon and thus not expected to arise across all contexts (Akan: Titov 2019; see also: Pollard & Yasavul 2016; De Veaugh-Geiss et al. 2018)?

Against this background, several recent studies have compared experimentally the exhaustive inference of clefts to exhaustive inferences in other constructions, such as sentences with exclusives, canonical non-cleft sentences, or definite pseudoclefts, i.e., definite descriptions with identity statements of the form '*The one who did* P *is α*' (e.g., Destruel et al. 2015; Onea &

[1] A citation of the primary source is included for all example sentences, with minor modifications made in the following cases: (i) some abbreviations in the glosses were altered for consistency or to follow the Leipzig Glossing Rules (Max Planck Institute for Evolutionary Anthropology 2018); (ii) an Akan native-speaker consultant disagreed with the orthographic form in the original, and any changes here are indicated with square brackets; and finally, (iii) for notational consistency some judgments have been modified, such as changing * to # when the reported unacceptability is due to semantics/pragmatics and not syntactic ill-formedness. Note that even though high/low tones are not marked in standard Akan (Kobele & Torrence 2006), tones are marked here when the cited text or language consultant included them.

[2] Also referred to in the literature on Akan as *exhaustive focus marking* (Duah 2015), *exhaustive focus* (Titov 2019), *selective focus* (Amfo 2010; in the sense of Dik et al. 1981), and *exclusive focus*.

Beaver 2009; Gerőcs & Babarczy & Surányi 2014; De Veaugh-Geiss et al. 2015; Destruel & De Veaugh-Geiss 2018; 2019; Zimmermann et al. 2020). The results of the experimental literature are generally consistent with the following claims: (i) exhaustivity in clefts is weaker than in sentences with exclusives but stronger than in canonical sentences; (ii) cleft exhaustivity need not hold and thus it is not conventionally-coded as part of the meaning of the cleft structure; and finally, (iii) clefts and definite pseudoclefts exhibit parallel behavior when compared directly. Furthermore, the above claims appear to hold cross-linguistically (e.g., German, English, and to some extent French; cf. Destruel & De Veaugh-Geiss 2019). The experimental studies presented here—employing the same design as the truth-value judgment task in violation contexts recently conducted on German *es*-clefts (De Veaugh-Geiss et al. 2018)—extend this work to Akan.

Anticipating the results to come, despite the unforeseen response patterns in the incremental information-retrieval paradigm used in the experiments, an exploratory analysis of the results suggests compelling parallels between Akan and German. Several variables were recorded in the experiments—including the proportion of continuations in the stepwise presentation of information as well as final truth-value judgments—but in this paper I analyze the final truth-value judgments, since it is these measurements which were ultimately informative. Although the analysis of the final judgments shows intermediate exhaustivity for clefts and definite pseudoclefts in both languages, a by-participant analysis reveals a range of responder types, from exhaustive to non-exhaustive: that is, the exhaustive inference in clefts and pseudoclefts was critical for some speakers, but not for others.

This paper will proceed as follows. Section 2 provides the background on focus-marking and the four sentence types of interest. Section 3 presents the experiments testing *na*-cleft and definite pseudocleft exhaustivity, with exclusives and canonical sentences as controls. A post hoc exploratory analysis of the results is provided in this section, with a direct comparison to two recent experiments on German *es*-clefts employing an identical design (De Veaugh-Geiss et al. 2018). In short, no difference was found between either clefts and pseudoclefts, nor German and Akan. In Section 4 various theoretical approaches to cleft exhaustivity are discussed in light of these results. Section 5 concludes.

2 Background

2.1 Focus-marking *in situ* and *ex situ* in Akan

Focus is an information-structural notion that, following Rooth (1992), I take to indicate the presence of salient alternatives in context relevant for interpretation (see, e.g., Krifka 2008). Question-answer pairs, i.e., new-information focus, as in (2a), is one way in which alternatives can be relevant for interpretation; other ways include corrective/contrastive focus and selective focus, among others (Hartmann & Zimmermann 2007: p. 366). Here I will concentrate primarily on new-information narrow focus. The subscript $_F$ indicates focus.

(2) a. Who was liberated yesterday? [Simona]$_F$ was liberated yesterday.
[ex. (1a) in Hartmann & Zimmermann 2007]

Akan employs at least two strategies for marking narrow focus. First, there is an *in situ* strategy, in which the focus-marked constituent appears in base position in the Subject-Verb-Object (SVO) sentence, illustrated in (3)A. I will refer to these as canonical sentences. Second, there is an *ex situ* strategy,[3] in which focus is marked morphosyntactically with the focus marker *nà* and the focus immediately preceding it in the left periphery, illustrated in (4)A. In the spirit of Boadi (1974), Kobele & Torrence (2006), and Grubic & Renans & Duah (2019), among others, I will refer to these *ex situ* constructions as *nà*-clefts.

(3) *Canonical*
Q: What did Kofi eat?
A: Kofi di-i [adua no]$_F$.
Kofi eat-PST beans DET
'*Kofi ate the beans.*' [ex. (35) in Genzel 2013]

(4) *nà-Cleft*
Q: Who did Nti beat?
A: [Kwaku$_i$]$_F$ nà Nti bó-ò nó$_i$.
Kwaku FM Nti beat-PST 3.SG.OBJ
'*It was Kwaku that Nti beat.*' [ex. (2) in Duah 2015]

Both the *in situ* and *ex situ* focus-marking strategies may give rise to an exhaustive inference. This is illustrated here by their unacceptability in a context which cannot be understood exhaustively: see example (5) for the canonical construction and example (6) for the *nà*-cleft, both with narrow object focus (Grubic & Renans & Duah 2019: §5.1; see also É. Kiss 1998; Szabolcsi 1981a;b).

(5) *Context*: Abena ate corn and groundnuts.
Q: What did Abena eat?
A: #Abena dì-ì [àbùró]$_F$.
Abena eat-PST corn
'*Abena ate corn.*' [ex. (35) in Grubic & Renans & Duah 2019]

(6) *Context*: Antwi bought a shirt and shoes.
#[Àtààdéɛ́]$_F$ nà Antwi tɔ́-ɔ̀ɛ́.
shirt FM Antwi buy-PST
'*It was a shirt that Antwi bought.*' [adapted from ex. (14A1) in Duah 2015]

[3] Note that I wish to remain neutral as to whether the constituent has been moved to or base generated in the left periphery (cf. Saah 1994; 2010; Ofori 2011; Titov 2019).

For narrow object focus, although both strategies give rise to an exhaustive inference, the canonical *in situ* construction is argued to be the default (Genzel 2013; Duah 2015). This is in contrast to narrow subject focus, for which the canonical structure is only acceptable in particular non-exhaustive contexts (Duah 2015; see also Pfeil & Genzel & Kügler 2015, and counter-arguments in Fiedler et al. 2010 and Titov 2019). To illustrate this, consider (7): Duah (2015) claims that *in situ* subject focus in A is acceptable because it is clear from the context that the answer given is not exhaustive; by contrast, the *ex situ* clefted form in A1 is unacceptable.

(7) Q: Who attended the funeral?
A: *Canonical (subject focus)*
Kofi bá-àɛ́.
Kofi come-PST
'*Kofi came.*'

A1: nà-*Cleft*
#Kofi nà ɔ-bà-àɛ́.
Kofi FM 3.SG.SBJ-come-PST
'*It was Kofi who came.*' [ex. (27) in Duah 2015]

Duah (2015: p. 21) proposes that "subject *in situ* focus is possible in some focus contexts[; however] when the context *does not require that what is focused be non-exhaustive*, focus tends to be *ex situ* for subjects" (emphasis added). In short, there is a subject/non-subject asymmetry in Akan: the default structure for object focus is claimed to be the canonical construction, whereas for subject focus it is the cleft. I will return to this subject/non-subject asymmetry in Section 2.3. First, however, I will discuss exhaustive inferences across the four main sentence types of interest here.

2.2 Exhaustivity across sentence types

Exhaustive inferences are found across various sentence types: besides canonical and cleft sentences, relevant here are sentences with an exclusive focus particle and definite pseudoclefts. In the following section I will present each of these sentence types, with a focus on the semantic vs. pragmatic source of exhaustivity.

2.2.1 The asserted exhaustivity of the exclusive focus particle

As with exclusive particles in other languages, a sentence with *ńkóáá* 'only' asserts exhaustivity.[4] One diagnostic for teasing apart assertions from other inferences is the *reason-clause* test (Beaver & Clark 2008): the reason for the main clause will be the asserted information in the

[4] The exclusive particle appears in the left periphery with the focus-marked constituent, but the exhaustive inference of the exclusive is independent of the cleft structure (Duah 2015: Fn. 7).

because-clause. Consider (8) below. As the language consultant states, the reason for repeating the exam is that nobody except Yaw passed, i.e., the exhaustive inference (Grubic & Renans & Duah 2019).

(8) *Context*: The teacher will repeat the exam, …
a. èfisɛ́ Yaw ńkóáá nà ɔ̀-twá-à ǹsɔ́hwɛ́ nó.
because Yaw only FM 3.SG.SBJ-pass-PST exam DET
'*because only Yaw passed the exam*'
(Comment: the teacher wants everybody to pass, and since Yaw is the only one who passed, the teacher will repeat the exam)
[ex. (41a) in Grubic & Renans & Duah 2019]

2.2.2 The implicated exhaustivity in canonical sentences

Conversational implicatures are cancellable; thus, if the exhaustive inference in the canonical construction is pragmatic it should be cancellable. Indeed, this is what is found, illustrated in (9)A for object focus (Grubic & Renans & Duah 2019). In this series of sentences, the exhaustive inference from the first sentence—I bought a shirt and nothing else; see (6) above—is cancelled by the second sentence. (Recall that narrow subject focus in the canonical construction is argued to be licensed only in non-exhaustive contexts.)

(9) Q: What did you buy?
A: *Canonical (object focus)*
Mè-tɔ̀-ɔ̀ àtààdéɛ́ ɛ́nà mé-tɔ̀-ɔ́ɛ́ m̀pàbòá ńsó.
1.SG-buy-PST short and 1.SG-buy-PST shoes also
'*I bought a shirt and I bought shoes also.*'
[ex. (44-A2) in Grubic & Renans & Duah 2019]

2.2.3 The debate about exhaustivity in *nà*-clefts

In contrast to canonical sentences, narrow focus in declarative *nà*-clefts gives rise to an exhaustive inference that is difficult to cancel. This is illustrated in (10)A, the clefted counterpart to (9)A above. The example below is with object focus, but the same unacceptability is found with subject focus (see, e.g., example (47) in Grubic & Renans & Duah 2019).

(10) Q: What did you buy?
A: nà-*Cleft (object focus)*
#Àtààdéɛ́ nà mè-tɔ̀-ɔ́ɛ́ ɛ́nà mè-tɔ̀-ɔ́ m̀pàbòá ńsó.
short FM 1.SG-buy-PST and 1.SG-buy-PST shoes also
'*It was a shirt that I bought and I bought shoes also.*'
[ex. (44-A1) in Grubic & Renans & Duah 2019]

Given this unacceptability, Grubic & Renans & Duah (2019: §5.2.2) conclude that exhaustivity in *nà*-clefts is conventionally-coded as part of the meaning of the cleft structure. In the same vein, Duah (2015), following Boadi (1974), posits that "the focus particle *nà* can be appropriately identified as an *exhaustive focus particle* because it occurs only in exhaustive focus environments" (p. 25).

Pfeil & Genzel & Kügler (2015) contradict such a strong claim based on the results of two experimental studies. In their production experiment, native-speaker participants used *nà*-clefts both in exhaustive and non-exhaustive contexts (albeit in the latter much less frequently). Pfeil & Genzel & Kügler (2015: p. 104) write: "our data suggest that this interpretation of the focus marker [i.e., as an exhaustive focus marker] is too narrow, since the use of [*nà*] is possible in non-exhaustive contexts as well". Similarly, Titov (2019) contends that *nà*-clefts do not semantically encode exhaustivity. Consider, for instance, the second clause in example (11), in which the concessive *mmom* would be odd if the exhaustivity inference was conventionally-coded in the cleft structure in the first clause: the use of the concessive indicates an interpretation of the first clause that '*I saw the woman (and possibly someone else)*'. Based on this example, among others, Titov argues that "the exhaustive reading is not part of the truth-conditional interpretation of the focus construction [with *nà*-clefts] and is therefore not obligatory" (2019: p. 16).

(11) ɔbaa no na me-huu no na mmom m-a-n-hu obi fo[f]oro biara.
woman the FM I-saw 3.SG but conversely I-not-saw [sic] person new any
'*Although the woman is who I saw, I didn't see anyone else (any new person).*'
[modified from ex. (31) in Titov 2019]

The ongoing debate about the source of the exhaustivity inference of clefts, and definite pseudoclefts, is the topic of the following section.

2.2.4 Theoretical approaches to the structure and meaning of clefts and definite pseudoclefts

Boadi (1974) claims that definite descriptions with identity statements of the form '*Nipa no a* P *ne α*' ('The person who did *P* is *α*') are the same focus-marking constructions as *nà*-clefts—namely, *na* is the basic focus marker from which *ne* in the pseudocleft is derived. More recently, Ofori (2011) analyzed *ne* as the basic form of the focus marker, while *na* is a fusion of the *ne* focus marker and the relative pronoun *a* 'who'. Consider (12), in which *ne* selects a headless relative clause after NP-deletion of the generic noun phrase *onipa* 'person'.

(12) Derived focus construction (headless relative clause)
a. Kofi$_i$ ne ~~onipa$_i$~~ a ɔ$_i$-ba-a ha.
Kofi FM person who 3.SG-come-PST here

b. → Morphophonological Fusion
Kofi$_i$ na ɔ$_i$-ba-a ha.
Kofi FM + who 3.SG-come-PST here
'*Kofi is who came here.*' [adapted from ex. (12b) in Ofori 2011]

In Ofori's (2011) approach, the morphonological fusion of the remaining contiguous elements *ne* + *a* results in the *nà*-cleft (cf. Titov 2019: §5, who similarly argues for *nà* being a fusion of the copula and relative marker, albeit the *nà*-cleft is not a derived form but is itself a type of pseudocleft equivalent to (12b), an inverse pseudocleft). Although differing in the details, the approaches of Boadi (1974), Ofori (2011), and Titov (2019) share the view that definite pseudoclefts and *na*-clefts are underlyingly the same; similar claims have been argued in the literature for clefts and pseudoclefts in other languages (among others, Akmajian 1970; Percus 1997; Büring & Križ 2013; Križ 2015; 2017; De Veaugh-Geiss et al. 2018).

With respect to their meaning, I will discuss two broad camps in the theoretical literature which take clefts and definite pseudoclefts to be semantically identical. I will refer to these two camps as (A) the SEMANTIC DEFINITE and (B) the DISCOURSE PRAGMATIC accounts. The term SEMANTIC DEFINITE subsumes a diverse group of theoretical analyses which conventionally-code exhaustivity as part of the meaning of definite pseudoclefts and clefts. For instance, in Percus 1997 *it*-clefts are syntactically derived from an underlying definite description with identity statement. In a nutshell, the derivation is as follows: from the definite pseudocleft '*the one(s) who ate the beans is Kodwo*', the relative clause is extraposed into clause-final position, and after applying a spell out rule for the definite, the pronoun *it* appears clause-initially, resulting in '*it* t_i is Kodwo [who ate the beans]$_i$'. In this approach, the exhaustive inference in clefts is the maximality[5] presupposition of the definite description plus identificational semantics. As Percus (1997: p. 333) writes: "[clefts and definite pseudoclefts] are identical in their properties, and any account that applies to one should apply to the other".

On the other hand, Büring & Križ (2013) propose that clefts and definite pseudoclefts encode exhaustivity as a homogeneity presupposition (cf. Schwarzschild 1996; Löbner 2000; Gajewski 2005). However, Križ (2017) later clarifies: "[Büring & Križ] speak of homogeneity as a presupposition […] though with some reluctance, as they all but say explicitly that they do so merely for lack of alternatives and do not want to strongly commit to a particular status of the neither-truth-nor-falsity that is observed with definite descriptions and cleft sentences, as long as it is the same in both cases" (p. 18). In Križ's (2017) revised account, clefts and pseudoclefts are taken to be identity statements between individuals: one individual is provided by the cleft pivot and the other by the cleft predicate turned into a number-neutral definite description, illustrated

[5] Percus (1997: p. 342) refers to uniqueness, but the null-head involved in clefts is unspecified for number—represented by one(s) above—and the analysis applies to both singular and plural entities.

in (13). When exhaustivity is violated the cleft/pseudocleft sentences suffer from a truth-value gap, referred to as homogeneity (see Križ 2019 for an overview to homogeneity; see also Renans & De Veaugh-Geiss 2019 for further discussion of Križ 2017).

(13) It was Kodwo who ate the beans.
The one(s) who ate the beans is Kodwo.
a. *true* iff Kodwo and only Kodwo ate the beans
b. *false* iff Kodwo did not eat the beans
c. *undefined* otherwise (*homogeneity*)
[adapted from ex. (24) in Križ 2017]

A crucial aspect shared by the SEMANTIC DEFINITE accounts is that exhaustivity is semantically encoded in both sentence types, and thus the inference is predicted to arise across speakers and contexts.

The DISCOURSE PRAGMATIC approaches include both the focal-exclusion analysis in Titov 2019 as well as the anaphoricity-driven analysis in Pollard & Yasavul 2016 and De Veaugh-Geiss et al. 2018, among others. For the focal-exclusion approach, Titov (2019) proposes that *nà*-clefts are an inverse pseudocleft in which an exhaustive interpretation is "favored but not obligatory", and when there is an available contrastive interpretation the exhaustive interpretation "can be dropped" (p. 17). Specifically, in this approach clefts/pseudoclefts are focus-marking devices which quantify over a discourse-salient set of alternatives,[6] and exhaustivity is just one of the ways to do so. Thus, exhaustivity may or may not arise depending on context. For example, the semantics of the example sentence '*It is Kodwo who ate the beans*' with a contrastive and exhaustive interpretation is shown below, in which the background and set of alternatives to the focus are represented in (14) and the two interpretations are shown in (15) (Titov 2013).

(14) $<\lambda x[x \text{ ate the beans}]$, Kodwo, {Kodwo, Ama, Kofi, …}>

(15) a. CONTRASTIVE
$\exists x[x \in \{\text{Kodwo, Ama, Kofi, …}\} \ \& \ x \neq \text{Kodwo} \ \&$
$\forall w[w \in \text{Dox(s)} \ \neg[x \text{ ate the beans}]]]$
[adapted from ex. (50) in Titov 2013]

b. EXHAUSTIVE
$\forall x[x \in \{\text{Kodwo, Ama, Kofi, …}\} \ \& \ x \neq \text{Kodwo} \ \neg[x \text{ ate the beans}]]$
[adapted from ex. (60) in Titov 2013]

[6] In Titov's (2019) analysis, object focus in the left periphery necessarily quantifies over such an alternative set, whereas subject focus may, but need not.

The interpretation obtained depends on how many of the alternatives are considered in context and rejected: for a contrastive interpretation, at least one member of the alternative set is considered, and in all worlds within the speaker's beliefs,[7] this member is rejected as a candidate for fulfilling the proposition, shown in (15a); by contrast, for an exhaustive interpretation all of the focal alternatives are rejected, shown in (15b).

For the second account in the discourse pragmatic camp, Pollard & Yasavul (2016), De Veaugh-Geiss et al. (2018), Destruel & De Veaugh-Geiss (2018; 2019), and Zimmermann et al. (2020) posit that clefts and definite pseudoclefts[8] obtain an exhaustive or a non-exhaustive interpretation through the resolution of the anaphoric existence presupposition encoded in both sentence types (see Delin 1992 for anaphoricity in clefts; see also Horn 1981; 2014, who similarly derives exhaustivity from the cleft existential). Specifically, the exhaustive interpretation is derived from the interaction of the existential with *wh*-questions: a *wh*-question introduces a maximal discourse referent *x* with respect to the background property *P* (Hamblin 1973), and the anaphoric *it*-cleft picks up this maximal discourse referent as its discourse antecedent, illustrated in (16).

(16) (Who ate the beans? / Who is the maximal *x* that ate the beans?)
It was Kodwo (who ate the beans).

By contrast, the non-exhaustive interpretation is obtained by resolving the existential to a non-maximal discourse antecedent, illustrated in (17). In this example, the cleft specifies an underspecified discourse referent (i.e., the indefinite *a gas station*). In contrast to Pollard & Yasavul (2016), who take (17) to lack a corresponding question, De Veaugh-Geiss et al. (2018) model such cases as giving rise to a *potential question*, shown in parentheses (see Onea 2013; 2016).[9]

(17) A: A gas station was robbed last night!
(What is this *x* that was robbed?)
B: It was the BP station near the Bethel intersection (that was robbed).
[adapted from ex. (7a) in Pollard & Yasavul 2016]

Under this approach (non-)exhaustivity arises *via* the anaphoricity of clefts and pseudoclefts, and not from contrastive or exhaustive exclusion. Nevertheless, what the two approaches in the

[7] Titov (2019: Fn. 6) writes: "Dox(s) stands for doxastically accessible worlds that represent what is true or false within the speaker's beliefs rather than in the real world ('s' stands for 'speaker')".

[8] Pollard & Yasavul (2016) and Destruel & De Veaugh-Geiss (2018) do not discuss pseudoclefts.

[9] Onea argues that discourse referents introduced by indefinites trigger a particular type of question called a potential question, informally described in Onea (2013 p. 13) as a question that arises when new information enters a discourse and "interlocutors may get interested in particular aspects of that piece of information and they may […] answer questions unrelated (or just loosely related) to the previous topic" (cf. questions and sub-questions in Roberts 2012).

DISCOURSE PRAGMATIC group share is that clefts and pseudoclefts may give rise to either an exhaustive or a non-exhaustive interpretation.

2.3 Strength of exhaustivity in clefts and definite pseudoclefts

Table 1 summarizes the above theoretical approaches in terms of the expected parallels between clefts and definite pseudoclefts and the strength of exhaustivity in both sentence types.[10] The term *strength* can be paraphrased in the following way: a strong inference is not (easily) cancellable, and it arises across experimental set-ups, experimental conditions, and speakers (see De Veaugh-Geiss et al. 2018: §2). Both the SEMANTIC DEFINITE and DISCOURSE PRAGMATIC accounts predict parallelism between clefts and pseudoclefts, but the two groups differ in the expected strength of the exhaustive inference. Specifically, given that exhaustivity is encoded in the cleft structure in the semantic definite accounts, exhaustivity is taken to be a strong inference which arises for all speakers. That said, in the discussion in Section 4 I will return to particular contexts in which maximality/homogeneity violations may be tolerated, referred to as non-maximality. In direct contrast, in the discourse pragmatic accounts exhaustivity is just one of the possible interpretations of a cleft, and thus variability in exhaustive interpretation is possible.

Of secondary interest here is an investigation into subject- vs. object-focus *nà*-clefts regarding the maxim of manner (Grice 1975).[11] Recall that in contrast to object focus, for which the canonical construction is the default construction, for subject focus the *nà*-cleft is the default focus-marking strategy (Genzel 2013; Duah 2015). As Grice (1975: p. 46) writes, the maxim of manner relates "not […] to what is said but, rather, to HOW what is said is to be said", and includes maxims such as "[a]void obscurity of expression" and "[b]e brief (avoid unnecessary prolixity)". Thus, one possibility is that exhaustivity effects for object *nà*-clefts may differ from subject *nà*-clefts, since

	± *parallel def.pse.*	± *strength*
(A) *semantic definite*	+	+
(B) *discourse pragmatic*	+	–

Table 1: Overview of theoretical approaches.

[10] For the sake of clarity, it should be noted by the reader that, for reasons which will soon become clear, the analysis presented in Section 3 is exploratory, and prior to running the experiments the theoretical predictions were as described in De Veaugh-Feiss et al. 2018 §2.1. The discourse pragmatic approaches had not yet been proposed when the experiments on Akan were initially planned.

[11] I refer to this as secondary since, given various limitations while preparing and running the experiments in Ghana, the subject/non-subject alternation in the experiments is a between-item manipulation in order to reduce the number of items and lists needed overall; nevertheless, subject/object focus was systematically distributed across the experimental trials in order to directly compare the two.

for clefted objects the speaker has flouted the maxim of manner by going 'out of her way' (to quote Horn 1981: p. 133) in using the cleft construction and not the default structural alternative; by contrast, clefting *is* the default structure for subject focus. No subject/non-subject asymmetry is found for the definite pseudocleft structure; thus, whatever potential effect of grammatical argument may be found for clefts is not expected to arise for definite pseudoclefts.

3 Experiments

The methods and design for the studies on Akan are identical to the experiments on German described in De Veaugh-Geiss et al. 2018. I will briefly discuss information about the German experiments relevant for the data analysis,[12] and all other details about the German experiments can be found at that source.

3.1 Methods & Design

3.1.1 Participants

For the two Akan versions of the experiments: In Experiment I (verifier) 29 participants (male: 9, female: 20; mean age: 22.48, age range: 18–32), and in Experiment II (falsifier) 29 participants (male: 9, female: 20; mean age: 21.34, age range: 18–25) were tested; note that the participants in Experiment I were distinct from the participants in Experiment II.[13] Participants, mostly undergraduate and graduate students, were recruited at the University of Ghana at Legon in February 2017 over a period of two weeks. Participants were compensated 10 Ghanian cedis for their participation. For the two German versions of the experiments the data set includes 32 participants in Experiment I (verifier) and 32 participants in Experiment II (falsifier); again, the participants in each experiment were distinct from one another.

3.1.2 Materials

All materials, including the instructions and target/filler items, were constructed by the author together with several Akan native-speaker students at the Linguistics Department at the University of Ghana at Legon. For a presentation of the target stimuli, including further details about the structure of the sentences used in the study, see Document 2 of the supplementary materials.

There were four sentence types with exhaustive inferences tested: two control conditions and two target conditions. The control conditions included (a) sentences with the exclusive particle *ńkóáá*

[12] German data and stimuli available at https://static.semprag.org/sp.11.3s.zip. Akan data and stimuli available as supplementary files to this article (see below).

[13] A total of 4 participants were removed from the data set for Akan given unexpected response behavior in the exclusive control condition: in the manipulation which should lead to the sentence with the exclusive being judged 'not true', namely when exhaustivity was falsified, 2 participants in Experiment I (verifier) and 2 participants in Experiment II (falsifier) judged the exclusive sentence as 'true' a majority of the time (3/4 'true' judgments). See Section 1 "Structure of the data" in Document 1 of the supplementary materials for details.

'only', illustrated in (18a), and (b) non-cleft canonical sentences, illustrated in (18b). The target conditions included (c) definite pseudocleft constructions, illustrated in (18c), and (d) *nà*-clefts, illustrated in (18d). Half of the trials were in past tense and half were in present tense. Note that for the auditory stimuli, in order to ensure that focus was on the intended constituent, e.g., on the object *Anan* in (18), the native-speaker who recorded the stimuli read all sentences as an answer to a narrow-focus *wh*-question in English, e.g., *Who did Yaa kick out?* (cf. Matthewson 2004). The manipulation of the grammatical argument involved having the focused entity in brackets—one of four fictional roommates—be either the subject or object, which was balanced across trials. Importantly, by having four fictional roommates identified by name with no further specification, the focal alternatives were unordered with respect to one another and the exhaustification domain was held constant. (Materials for the German version of the experiments were directly comparable in form though differing in the lexicalizations and, importantly, the grammatical argument manipulation; see De Veaugh-Geiss et al. 2018 for a description of the German stimuli).

(18) **Example** – Item 124

a. [Anan]$_F$ nkoaa na Yaa pamoo no.
Anan only FM Yaa kicked.out 3.SG.OBJ
'*It is only* ANAN *who Yaa kicked out.*' (*Exclusive*)

b. Yaa pamoo [Anan]$_F$.
Yaa kicked.out Anan
'*Yaa kicked out* ANAN.' (*Canonical*)

c. Nipa no a Yaa pamoo no ne [Anan]$_F$.
person the who Yaa kicked.out 3.SG.OBJ is Anan
'*The person who Yaa kicked out is* ANAN.' (*Def.Pse.*)

d. [Anan]$_F$ na Yaa pamoo no.
Anan FM Yaa kicked.out 3.SG.OBJ
'*It is* ANAN *who Yaa kicked out.*' (*Cleft*)

For the filler trials there were four sentence types: (i) sentences with the universal quantifier *obiara* 'everyone', as in (19); (ii) sentences with the verum expression *ɛyɛ nokware* 'it's true that', as in (20); (iii) sentences with a plural conjunction, as in (21); and (iv) sentences starting with *nnipa a ɔmo nnuru mmiɛnsa* 'fewer than three people', as in (22). Half were in past tense and half in present tense, and all items had a subject/object alternation for the relevant manipulation balanced across trials. The filler trials had three crucial characteristics: (i) the number of expected 'true' vs. 'not true' judgments was balanced across the trials so that the experiment was not biased toward one or the other extreme; (ii) in order to use all four 'boxes' throughout the experiment in the incremental-information paradigm (see below for the procedure), the filler trials varied in terms of the number of 'roommates' participants had to uncover in order to make a judgment; and (iii) the filler trials differed from the target trials in terms of when a judgment was expected to be made.

(19) Obiara kɔ kwan so.
everyone go.PRS road top
'*Everyone is a trader.*'

(20) ɛyɛ nokware sɛ Obimpɛ fee Kwaku ano.
it's true that Obimpɛ kiss.PST Kwaku mouth
'*It's true that Obimpɛ kissed Kwaku.*'

(21) Afriyie hwehwɛɛ Kwame ne Anan.
Afiriyie search.PST Kwame and Anan
'*Afiriyie searched for Kwame and Anan.*'

(22) Nnipa a ɔmo nnuru mmiɛnsa hanee boafoɔ.
person who 3.PL NEG.reach three hire.PST helper
'*Fewer than three people hired a helper.*'

Each condition had 8 lexicalizations, 4 with subject focus and 4 with object focus. There were 32 items in the target/control trials and 32 items in the filler trials, for 64 trials in total.

3.1.3 Procedure

The experiments used a sentence-picture verification task in an incremental information-retrieval paradigm (Conroy 2008; Franke & Schlotterbeck & Augurzky 2016). The procedure was identical to that described in De Veaugh-Geiss et al. 2018; 2017 (German; see §3) as well as in Destruel & De Veaugh-Geiss 2019 (French; see §3) and Zimmermann et al. 2020 (English and Hungarian; see §3); however, the exploratory analysis presented here differs from those studies.

In the instructions, participants were introduced to four fictional roommates, and participants were told that these four roommates will undertake various activities together. At the start of each trial, a computer screen showing four covered boxes was presented while the stimulus played in the participants' headphones. The screen looked as in the left image in **Figure 1**. After hearing the auditory stimulus, participants were asked to uncover as many boxes as necessary to decide if the sentence they heard was *nokware* 'true' or *ɛnyɛ nokware* 'not true'. Each box contained a photo of one of the roommates[14] and a written first person statement about which activity this roommate did, as in the right image in **Figure 1**. The experimental

[14] Photos by Mark Fischer used in accordance with the CC BY-SA license (https://creativecommons.org/licenses/by-sa/2.0/): (i) https://www.flickr.com/photos/fischerfotos/16360022790/, (ii) https://www.flickr.com/photos/fischerfotos/22986270194/, (iii) https://www.flickr.com/photos/fischerfotos/23519903990/, (iv) https://www.flickr.com/photos/fischerfotos/23484547082/.

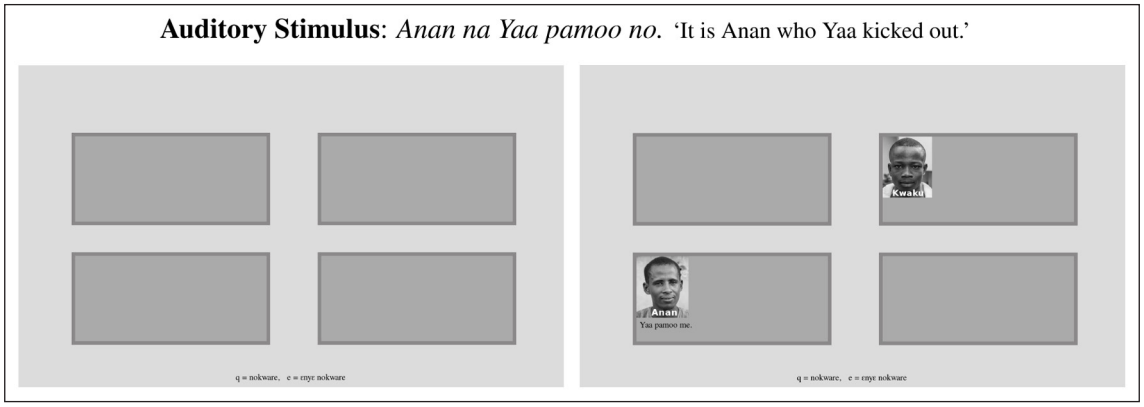

Figure 1: (i) Start of each trial (ii) Uncovering the 2nd box.

software was programmed in Python (PSFL: GNU/Linux v.3.4.2) using the PyGame module (LGPL: v.1.9.2a0, Shinners 2011), which allowed full control over the experimental set-up. Both experiments began with three practice trials using stimuli that were unrelated to the experimental materials.

For 23 participants (Experiment I) and 22 participants (Experiment II) out of the total 29 participants per experiment, the boxes were uncovered by moving the cursor over them with the mouse, and after entering a box the cursor could not exit for at least 2000 ms in order to disincentivize unnecessary uncovering of the remaining boxes. When the cursor eventually left a box, the text inside disappeared. Participants were free to choose which box they uncovered next, but they did not know that their choice had no influence on the order of information they received—the order was pre-determined by the experimental software. Participants were instructed to press one of two designated keys on the keyboard for either 'true or 'not true' once they had enough information to make a decision. Once a judgment was made the boxes onscreen were recovered and the next item played in their headphones.

For the final 6 participants in Experiment I and 7 participants in Experiment II the procedure was slightly different. Anticipating the discussion to come, almost all of the participants had behaved unexpectedly in the CANONICAL and EXCLUSIVE control conditions: namely, a response strategy was employed of first uncovering all boxes before making a truth-value judgment regardless of the information presented on screen. Thus, to further disincentivize an uncover-first-judge-later strategy, for these 13 participants the controls were changed to be keyboard-driven (i.e., the space bar was used to uncover boxes) and, crucially, the delay between uncovering was increased to 5000 ms. This increased delay doubled the total running time of the experiment. Although the extended delay influenced to a slight degree when participants made a judgment, many participants still uncovered all boxes before making a decision; furthermore, and most importantly in light of the final judgments made, the reasons for further uncovering remain unclear.

3.1.3.1 Experiment I (verifier)

In Experiment I, the contextual information provided in Box 2 (early manipulation) *verified* the canonical meaning of the target stimulus; hence, I will refer to this experiment as 'verifier' in order to distinguish it from Experiment II, which used the exact same design but had a different manipulation at Box 2. Consider, for instance, the exclusive control stimulus with object focus in (18a), repeated in (23).

(23) *Auditory Stimulus*
Anan nkoaa na Yaa pamoo no.
Anan only FM Yaa sack.PST 3.SG.OBJ
'*It is only* ANAN *who Yaa kicked out.*' [Target Item 124]

In this case, Box 2 showed one of the fictional roommates, i.e., Anan, stating *Yaa pamoo me* 'Yaa kicked me out', illustrated in the right image in **Figure 1**, thus verifying the canonical meaning of *Yaa kicked out Anan*. For the exclusive control condition, as shown in example trial (24), it is expected that participants will continue uncovering in order to check whether the asserted exhaustive inference holds.

For the later boxes, there was an additional late manipulation, ±EXH. In half of the trials one of the remaining two roommates falsified the exhaustivity inference (–EXH), and this exhaustivity violation was equally distributed across Box 3 and Box 4. The other half of the trials were compatible with an exhaustive interpretation of the auditory stimuli (+EXH), not shown here for the sake of space: in this late manipulation, it is revealed that of the four roommates only Anan in Box 2 has stated that Yaa kicked him out. In this case, the sentence will be true for all sentence types, which will soon become important for checking that participants were engaged with the task. An example of a full trial with a verifier in Box 2 (+VER) and a falsifier in Box 4 (–EXH) for auditory stimulus (23) is shown in (24).

(24) Full trial for Experiment I (verifier)
Auditory Stimulus: '*It is only* ANAN *who Yaa kicked out.*'

Box 1: Kwaku Yaa titii me ho. Yaa scratch.PST 1.SG.OBJ around '*Yaa scratched me.*'	**Box 2: Anan (+VER)** Yaa pamoo me. Yaa sack.PST 1.SG.OBJ '*Yaa kicked me out.*'
Box 3: Kofi Yaa hyiraa me. Yaa bless.PST 1.SG.OBJ '*Yaa blessed me.*'	**Box 4: Kwame (–EXH)** Yaa pamoo me. Yaa sack.PST 1.SG.OBJ '*Yaa kicked me out.*'

3.1.3.2 Experiment II (falsifier)

In Experiment II, a mirror of Experiment I, the contextual information provided in Box 2 (early manipulation) *falsified* the exhaustivity inference of the target stimulus; hence, I will refer to this experiment as 'falsifier' in order to distinguish it from Experiment I (verifier). For instance, consider any of the target sentences in (18), but now in Box 2 Kwame (instead of Anan, who has not been revealed yet) states *Yaa kicked me out*, violating in the early manipulation the exhaustivity inference that Yaa kicked out nobody other than Anan. For the exclusive control condition, as shown in example trial (25) below, it is expected that participants will stop uncovering at Box 2 in order to judge the sentence as 'not true'.

For Box 3 or Box 4, there was an additional manipulation, ±CAN. Namely, the canonical meaning of the target stimulus was verified in half of the trials (+CAN); for instance, Anan says Yaa kicked him out, shown in Box 4 in (25) below. In the other half of the trials, the canonical meaning was not verified (–CAN), not shown here; in this case, the sentence is not true for all sentence types, which will soon become important for checking that participants were engaged with the task. An example of a full trial with a falsifier in Box 2 (+FAL) and a verifier in Box 4 (+CAN) for auditory stimulus (23) is illustrated in (25).

(25) Full trial for Experiment II (falsifier)
Auditory Stimulus: '*It is only ANAN who Yaa kicked out.*'

Box 1: Kofi Yaa hyiraa me. Yaa bless.PST 1.SG.OBJ '*Yaa blessed me.*'	**Box 2: Kwame (+FAL)** Yaa pamoo me. Yaa sack.PST 1.SG.OBJ '*Yaa kicked me out.*'
Box 3: Kwaku Yaa titii me ho. Yaa scratch.PST 1.SG.OBJ around '*Yaa scratched me.*'	**Box 4: Anan (+CAN)** Yaa pamoo me. Yaa sack.PST 1.SG.OBJ '*Yaa kicked me out.*'

In the German version of the experiments, the distribution for the manipulations at Box 2 as well as for Box 3/4 was fully balanced. This was not so in the Akan version of the experiments. For Akan, the distribution was such that the late manipulations were fixed per item: for example, the late manipulation for Item 102 always appeared in the [+EXH] condition in Experiment I (verifier) and in the [–CAN] condition in Experiment II (falsifier). This was done for two reasons: First, the outcome variable was intended to be whether participants made a truth-value judgment at the early manipulation at Box 2—which was indeed the same for all experiments and languages—and the late manipulations at Box 3/4 were controls that participants understood the logic of the experiment (see De Veaugh-Geiss et al. 2018 §3.4 for discussion). Second, there were various

on site limitations while conducting the experiments; thus, some changes were made to simplify the experiment, and having the late manipulations fixed was one way to reduce the number of lists needed for the Latin square distribution. As a result, for the exploratory analysis here not all combinations are represented for all items in the Akan data.[15]

As will be discussed shortly, what is ultimately analyzed here is not the proportion of judgment vs. continue responses at Box 2 as per the intended design, but the final truth-value judgments regardless of when that judgment was made. The reason for that will become clear in the following section.

3.1.4 Motivating the exploratory analysis

The participants in the Akan version of the experiments generally exhibited an uncover-first-judge-later response strategy, which in this section I will explore in detail. First, I take a look at the results for the control conditions at Box 2, in which either the canonical meaning was verified (Experiment I) or the exhaustivity inference falsified (Experiment II). In these early manipulations, the German and Akan data appear to differ. After this I present a different way of looking at the data—taking into account both the early and late manipulations together—which in fact suggests participants were engaged in the task. Following this, I present the linking hypotheses and research questions for the post hoc exploratory analysis.

3.1.4.1 Control conditions at Box 2

At Box 2, results differ quite drastically between Akan and German in the canonical and exclusive control conditions, shown in **Figure 2**. In this graph, the proportion of 'continues' (i.e., when participants continued to Box 3/4) is plotted. The predictions for the control conditions were as follows: For the canonical condition in Experiment I (verifier), since exhaustivity is a non-truth-conditional inference it was expected that participants would make a 'true' judgment a majority of the time and *not* continue uncovering Box 3/4. By contrast, for the exclusive condition in Experiment II (falsifier), since exhaustivity is part of the truth-conditions it was expected that participants would make a 'not true' judgment—after all, the exhaustivity inference has been falsified—and *not* continue uncovering a majority of the time.

As can be seen, German participants choose to make a judgment a majority of the time, seen in the low proportion of 'continues' in **Figure 2**, whereas Akan participants largely choose to

[15] For instance, Akan Item 102 did not appear in the combination when the canonical meaning is verified but exhaustivity violated—that is, [+VER, –EXH] in Experiment I (verifier) or [+FAL, +CAN] in Experiment II (falsifier)—but it is precisely these combinations that will soon be of primary interest. See Section 1 "Structure of the data" in Document 1 of the supplementary materials for a detailed overview of the data used in the analysis.

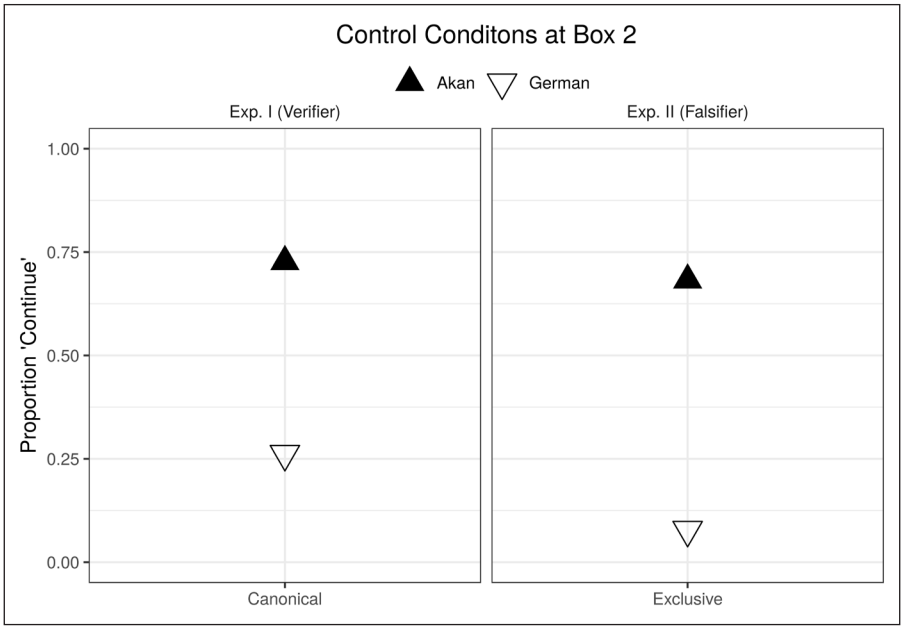

Figure 2: A comparison of the proportion of 'continues' at Box 2 in the CANONICAL (Experiment I) and EXCLUSIVE (Experiment II) conditions, responses made before uncovering Box 3/4. Since sufficient information was revealed to make a judgment, it was expected that participants would not continue uncovering Box 3/4, contrary to what is found in Akan.

continue uncovering in these conditions.[16] A naive interpretation of these results is as follows: the canonical condition in Akan has a stronger exhaustivity inference than in German, since the Akan participants in Experiment I (verifier) choose to keep uncovering Box 3/4 in order to check that the exhaustivity inference holds. Moreover, the exclusive *ńkóáá* 'only' is not nearly as exhaustive as the German counterpart *nur* 'only', since despite the exhaustivity violation the participants in Experiment II (falsifier) continued uncovering in order to check whether the canonical meaning is verified.

This interpretation, however, would fly in the face of the literature, in which it is claimed that canonical sentences in Akan are only weakly exhaustive at best, and, furthermore, the exclusive particle in Akan is typically analyzed as on a par with exclusive particles in other languages (Section 2.2.1). Moreover, by looking at the data from a different perspective it is clear that the above interpretation is incorrect. That is, instead of analyzing what happens at Box 2, one can look at the

[16] In the Akan version of the experiment, recall that the delay between uncoverings was 2000 ms for 45 participants and 5000 ms for 13 participants; however, the proportions shown here are averaged over both groups. To note, there was in fact a small difference in the proportion of continues made at Box 2 for the participants with the increased delay. Specifically, in Experiment I (verifier) the focus condition elicited 66% continues (29/44) and in Experiment II (falsifier) the exclusive condition elicited 47% continues (24/51)—i.e., averages which are just slightly lower than that found in **Figure 2**. Nevertheless, this difference is not relevant in light of participants' final truth-value judgments.

final truth-value judgments irrespective of when that judgment was made taking into consideration both the early and late manipulations, and a wholly different cross-linguistic pattern is found.

3.1.4.2 A different perspective: final truth-value judgments

Note that there are four possible combinations for the Box 2 plus Box 3/4 manipulations (Experiment I: +VER, ± EXH; Experiment II: +FAL, ± CAN). Here I will present the two manipulations which are predicted to elicit invariably 'true' judgments and invariably 'not true' judgments for all sentence types. By considering the response patterns in these two manipulations first, I can be confident that participants were in fact sensitive to the information presented in the experimental trials.

In Experiment I, when participants find that the canonical meaning is verified at Box 2, and—in the event they continue to uncover boxes—they discover that exhaustivity holds across Box 3 and Box 4 (i.e., [+VER, +EXH]), the sentence is predicted to be judged 'true', regardless of sentence type. This is exactly what was found for both languages (modulo noise). By contrast, in Experiment II, when participants find that the exhaustivity inference is falsified at Box 2, and—in the event they continue to uncover boxes—they discover that the canonical meaning does not hold in either Box 3 or Box 4 (i.e., [+FAL, –CAN]), the sentence is predicted to be judged 'not true', regardless of sentence type. Again, this pattern is precisely what was found for both languages (modulo noise). These results are found in the two left graphs in **Figure 3**. (The two right graphs will be discussed shortly in Section 3.2.1.)

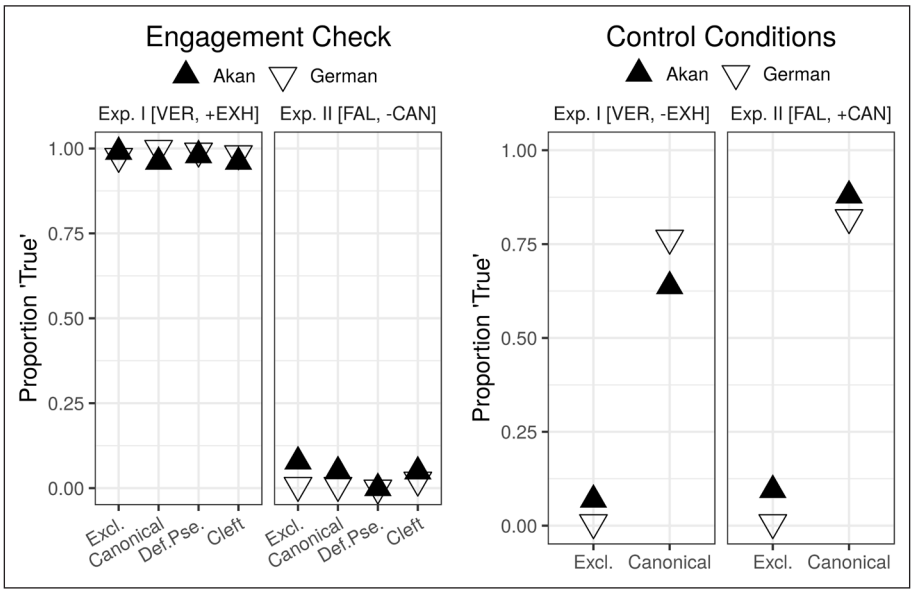

Figure 3: Final truth-value judgments (0 = not true, 1 = true): *Left:* for all sentence types when the early + late manipulation is predicted to elicit either 'true' [+VER, +EXH] or 'not true' [+FAL, –CAN] judgments; *Right:* for control conditions in the critical combinations [+VER, –EXH] and [+FAL, +CAN].

3.1.5 Linking hypotheses and research questions

For the analysis in Section 3.2, I will focus on the two critical combinations which are identical in informational import when looking at the unordered combinations of early and late information, namely [+VER, –EXH] and [+FAL, +CAN]—i.e., when the canonical meaning holds but exhaustivity is violated. When analyzing the final truth-value judgments, there are only two response choices, 'true' and 'not true'.

- If exhaustivity is a strong inference, i.e., it is not (easily) cancellable and it arises across experimental set-ups, experimental conditions, and speakers ⟹ the target sentence will generally be judged 'not true' in the critical combinations since the exhaustivity inference has been violated. The asserted exhaustivity of the exclusive condition is the control.
- If exhaustivity is not a strong inference ⟹ the target sentence may generally be judged 'true' in the critical combinations since the exhaustivity inference is not obligatory. The implicated exhaustivity of the canonical condition is the control.

The research questions I address in this paper are presented in Q1–Q3 below.

Similar to the semantic-pragmatic division found in the theoretical literature on English *it*-clefts (see De Veaugh-Geiss et al. 2018: §2.1 for an overview), it has been claimed both (i) that exhaustivity in clefts in Akan is conventionally-coded and thus obligatory (e.g., Grubic & Renans & Duah 2019); and (ii) that exhaustivity is just one of the interpretive options for the *nà*-cleft structure and thus not obligatory (Titov 2019). Indeed, it is theoretically possible that German and Akan encode exhaustivity in clefts/pseudoclefts differently: e.g., exhaustivity in German *es*-clefts is a discourse pragmatic phenomenon (see, e.g., De Veaugh-Geiss et al. 2018), while Akan *nà*-clefts encode exhaustivity as part of their conventional meaning. In fact, Grubic & Renans & Duah (2019) argue for such cross-linguistic variation in cleft exhaustivity for Akan/Ga (Kwa) vs. Ngamo (West Chadic). In the former exhaustivity is claimed to be a conventionally-coded inference, whereas in the latter it is a pragmatic one (cf. clefts in St'át'imcets and Nłe?kepmxcín, which are also claimed to lack a 'semantic' exhaustivity inference; see Davis & Matthewson & Shank 2004; Koch & Zimmermann 2010). Similar cross-linguistic variation is also claimed for the existence presupposition of clefts. For instance, Davis & Matthewson & Shank 2004, Koch & Zimmermann 2010, and Grubic & Renans & Duah 2019 argue that clefts in St'át'imcets, Nłe?kepmxcín, and Ngamo lack an existential inference; by contrast, clefts in German, Akan, English, etc. are all claimed to encode existence as a presupposition.

Assuming clefts and pseudoclefts in Akan are underlyingly the same, the two are predicted to exhibit parallel exhaustivity effects. Thus, the first question is as follows:

Q1 *Cross-linguistic variability*: Are clefts and definite pseudoclefts strongly exhaustive in Akan, in particular in comparison to their counterparts in German? If the answer is yes, then

this should be found when comparing clefts and definite pseudoclefts and their interaction with language in Model 1 in Section 3.2.2, and a positive result may provide evidence against taking a unified cross-linguistic analysis.

As a secondary investigation, I entertained the idea that exhaustivity in object *nà*-clefts may differ from subject *nà*-clefts since for subject focus the cleft is the default structure, whereas for object focus use of the cleft flouts the maxim of manner (e.g., "be brief (avoid unnecessary prolixity)"); by contrast, there is no reason to expect that definite pseudoclefts in Akan will differ across grammatical arguments. Thus:

Q2 *Inter-argument and inter-sentential variability*: In Akan, do object clefts exhibit a difference in exhaustivity compared to (i) subject clefts and (ii) definite pseudoclefts for either grammatical argument? If the answer is yes, this should be found in the interaction of grammatical argument and sentence type in Model 2 in Section 3.2.2.

Finally, given the by-participant results reported in De Veaugh-Geiss et al. 2018, another question that is of interest here is as follows:

Q3 *Inter-speaker variability*: Do Akan participants show variability in individual response patterns, with groups of exhaustive and non-exhaustive responders, as was reported for German? If the answer is yes, then this should be found when looking at participant-specific responses from Model 1 in Section 3.2.3.

3.2 Results

When the canonical meaning holds but exhaustivity is violated (i.e., [early, late] combinations for Experiment I [+VER, –EXH] and Experiment II [+FAL, +CAN]), differences between sentence types emerge: whereas the CANONICAL and EXCLUSIVE control conditions elicited a majority of 'true' and 'not true' judgments, respectively, CLEFTS and DEFINITE PSEUDOCLEFTS show a different—but parallel—pattern, and this across both languages.

3.2.1 Critical combinations

I refer to the above early/late combinations as 'critical' since it is in these combinations that a difference between sentence types in terms of exhaustivity may emerge. I will start with the control conditions, which are plotted in the right graphs in **Figure 3** (on page 16). In Akan, the EXCLUSIVE condition elicited few 'true' judgments when exhaustivity was falsified (<9%), and a similar pattern was found in German, although participants there made close to zero 'true' judgments (<1%). A brief note on these results: It is, perhaps, not unexpected that the data for exclusives in German show floor effects, whereas in Akan there is more noise. Recall that Akan

participants employed an uncover-first-judge-later response strategy. This strategy will increase the demands of the task as more information must be stored in memory over a longer period of time; by contrast, German participants immediately stopped uncovering at the box with the falsifier. Nevertheless, the general response pattern for exclusives is as expected in both languages. Moreover, for the canonical sentences, the opposite pattern was found, also as expected (Akan: 64%–88%; German: 77%–82% 'true' judgments). As for the primary conditions of interest, in Akan the DEFINITE PSEUDOCLEFT elicited, on average, low mid-range 'true' responses (35%–45%), and in German a similar pattern was found (42%–48%). Moreover, results for clefts were comparable across languages: Akan *nà*-CLEFTS and German *es*-CLEFTS elicited 'true' responses almost half of the time (39%–47%), similar to their definite pseudocleft counterparts. See **Table 2** for an overview of the descriptive results for all sentence types.

3.2.2 Bayesian analysis

For the statistical analysis of the data, two binomial mixed logistic regression models in a Bayesian framework were fitted; see, e.g., Kruschke & Liddell 2018 and Vasishth et al. 2018 for a general introduction to Bayesian modelling. The statistics software *R* (v. 3.6.3, GPL-2 | GPL-3; R Core Team 2019) with the *brms* package (v. 2.13.0, GPL >= 3; Bürkner 2017; 2018) was used, which provides an interface to fit Bayesian models using Stan (New BSD License; Stan Development Team 2018). There were 122 participants in the analysis (Akan: 29 participants * 2 experiments; German: 32 participants * 2 experiments), with a total of 4 judgments per participant for each of

		Akan	***German***
EXCL.	Exp.I [+VER, –EXH]	8/116 'true' (7%)	1/128 'true' (<1%)
	Exp.II [+FAL, +CAN]	11/116 'true' (9%)	1/128 'true' (<1%)
CANONICAL	Exp.I [+VER, –EXH]	74/116 'true' (64%)	98/128 'true' (77%)
	Exp.II [+FAL, +CAN]	102/116 'true' (88%)	105/128 'true' (82%)
DEF.PSE.	Exp.I [+VER, –EXH]	41/116 'true' (35%)	61/128 'true' (48%)
	Exp.II [+FAL, +CAN]	52/116 'true' (45%)	54/128 'true' (42%)
CLEFT	Exp.I [+VER, –EXH]	49/116 'true' (42%)	60/128 'true' (47%)
	Exp.II [+FAL, +CAN]	45/116 'true' (39%)	59/128 'true' (46%)

Table 2: Number of 'true' judgments out of the total number of judgments per condition in the critical combinations [+VER, –EXH] and [+FAL, +CAN].

the 4 sentence types when looking at the critical combinations of early and late manipulations, for a total of 1,952 data points (122 * 4 * 4). Model 1 compares the main effects of ST (*Sentence Type*, 4 levels: EXCLUSIVE, CANONICAL, DEF. PSE., CLEFT) and LANG (*Language*, 2 levels: AKAN, GERMAN) as well as their interaction (ST:LANG). Model 2 was fit to the subset of data for Akan to explore the effects of ST (*Sentence Type*, 2 levels: DEF. PSE., CLEFT) and ARG (*Argument*, 2 levels: SUBJECT, OBJECT) as well as their interaction (ST:ARG).

For the comparisons in the models, contrast matrices were defined following Schad et al. 2020; see Document 1 of the supplementary materials. For Model 1, the sentence type (within-participant, within-item factor) comparisons were coded using centered treatment contrasts, with clefts as the baseline: ST1 compared the cleft condition to the exclusive condition; ST2 compared the cleft condition to the canonical condition; and finally, ST3 compared the cleft condition to the definite pseudocleft condition. For the factor LANG (between-participant, between-item), sum contrasts were used.[17] For Model 2, which looked at the effect of grammatical argument (a within-participant, between-item factor), only the Akan data for the definite pseudocleft and cleft conditions were of interest. The ARG and ST comparisons had sum contrasts. For the random-effects structures, varying intercepts as well as varying slopes for the within-participant and within-item manipulations were used. Moreover, regularizing priors were defined in order to downweight extreme values and obtain stable inferences (Vasishth et al. 2018).[18] In Document 1 of the supplementary materials, see Section 2 “Data analysis” for the specification of the models reported here.

From the models I will report the posterior distribution of the parameters of interest and the 95% credible intervals (CrI)—i.e., given the data and model, the interval containing the 95% most credible values of the parameter. In cases when the credible interval of the estimates overlaps with zero, this will be taken as evidence of uncertainty about the effect, since it is possible that the effect is either zero (no effect) or has the wrong sign (e.g., the effect is in fact positive despite the posterior mean having a negative value). By contrast, when the credible interval does not overlap with zero, this will be interpreted as evidence of an effect.

As can be seen in the left plot in **Figure 4**, in Model 1 for all primary comparisons of interest there is no evidence of an effect: when comparing definite pseudoclefts and clefts in the ST3

[17] In an analysis not reported here, with Model 1 fit to include the factor EXP (*Experiment*, 2 levels: EXP 1, EXP 2), no differences for the comparisons of the cleft and definite pseudocleft conditions are found and thus no conclusions differ, so for the sake of space I report the simpler model. That said, results from this more complex model suggest evidence of two interactions involving experiment and the ST2 (canonical/cleft) comparison, namely, a weak two-way interaction of EXP:ST2 and a weak three-way interaction of EXP:ST2:LANG. These results appear to be driven by a difference in Akan for the canonical condition in the proportions of ‘true’ judgments across experiments (see **Table 2**). I will leave discussion of this variability in the canonical condition for future research.

[18] I am not computing Bayes factors here, which are highly sensitive to the prior, and in particular the prior uncertainty (Schad & Betancourt & Vasishth 2021).

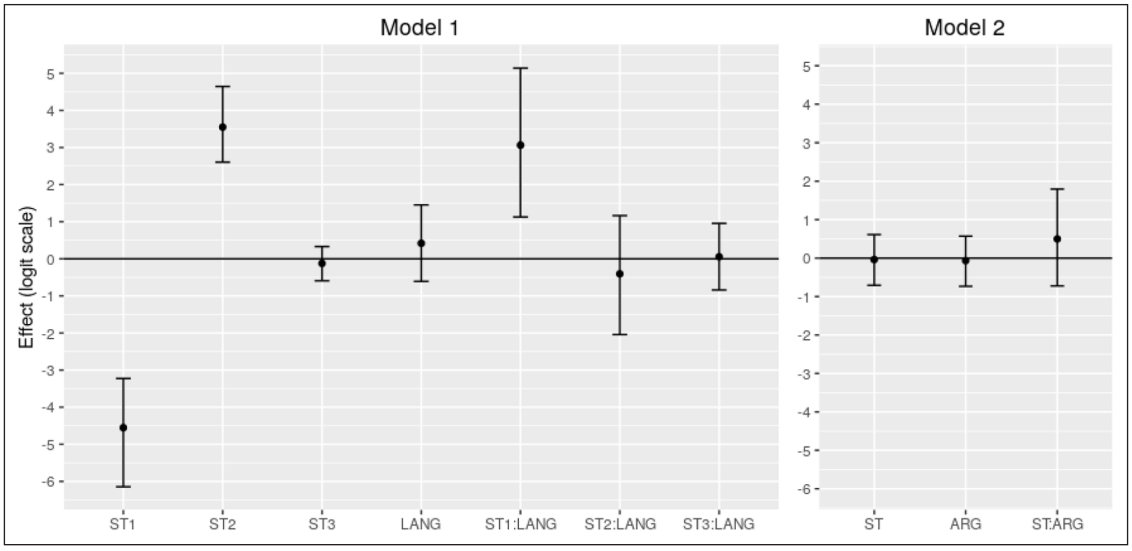

Figure 4: Model estimates (posterior mean and 95% credible intervals).

comparison ($\hat{\beta}$ = –0.12, CrI: [–0.60, 0.33]) and the interaction of ST3:LANG ($\hat{\beta}$ = 0.06, CrI: [–0.84, 0.95]), all credible intervals overlap with zero to a considerable degree. By contrast, there is robust evidence of a negative effect for the ST1 comparison ($\hat{\beta}$ = –4.55, CrI: [–6.15, –3.23]), with the exclusive control condition more likely to be judged 'false' when compared to the cleft condition; moreover, there is robust evidence of a positive effect for the ST2 comparison ($\hat{\beta}$ = 3.55, CrI: [2.60, 4.64]), with the canonical control condition more likely to be judged 'true' when compared to clefts. Both of these results are as expected. What is unexpected, though, is the robust evidence of an interaction of ST1:LANG ($\hat{\beta}$ = 3.06, CrI: [1.13, 5.14]), with exclusives in Akan more likely than exclusives in German to be judged 'true' despite the violation context, contrary to expectations. However, as discussed previously, the uncover-first-judge-later strategy of the Akan participants will arguably increase the cognitive load of the task; moreover, the noisier data for Akan (7%–9% 'true' judgments for exclusives) and the near floor results in German (<1% 'true' judgments for exclusives) would likely make any statistical comparison between the two languages robust.

To investigate exhaustivity effects across grammatical arguments (subjects vs. objects), Model 2 was fit to a subset of data: the definite pseudocleft and cleft conditions in Akan. As can be seen in the right plot in **Figure 4**, for the primary comparisons of interest there is no evidence of a main effect of argument (ARG $\hat{\beta}$ = –0.07, CrI: [–0.73, 0.57]); nor is there evidence for an interaction of grammatical argument with sentence type (ST:ARG $\hat{\beta}$ = 0.50, CrI: [–0.72, 1.79]). In short, from this model there is no indication that clefted object focus differs from either clefted subject focus or their definite pseudocleft counterparts.

3.2.3 By-participant results

As seen in **Table 2**, clefts and definite pseudoclefts in Akan and German elicited on average intermediate response patterns; however, De Veaugh-Geiss et al. (2018) report for German that the intermediate response pattern was not due to individual participants responding at chance levels with a normal distribution around the mean; rather, participants fell into two main clusters, i.e., those who largely judged the sentences as 'true' (*non-exhaustive* responders) or as 'false' (*exhaustive* responders).

As can be seen in the plots in **Figure 5** for the data in both languages, Akan participants similarly exhibit a multimodal distribution. In the left plot one finds the counts of participants given the number of 'true' judgments made. Each participant had the possibility of making up to four judgments in the critical manipulations: when participants made 0/4 judgments, they are counted up in the leftmost bar, and so on for 1/4 judgments, etc. Plotted in this way, the majority of participants in most conditions in both languages either made 0/4 'true' judgments (*exhaustive* responders) or 4/4 'true' judgments (*non-exhaustive* responders), with fewer participants in between (although the shape of the definite pseudocleft condition in Akan is slightly different, with a peak at the left and perhaps two smaller peaks in the middle and right). In the right plot, the correlation between sentence types is shown: the y-axis shows the counts for clefts

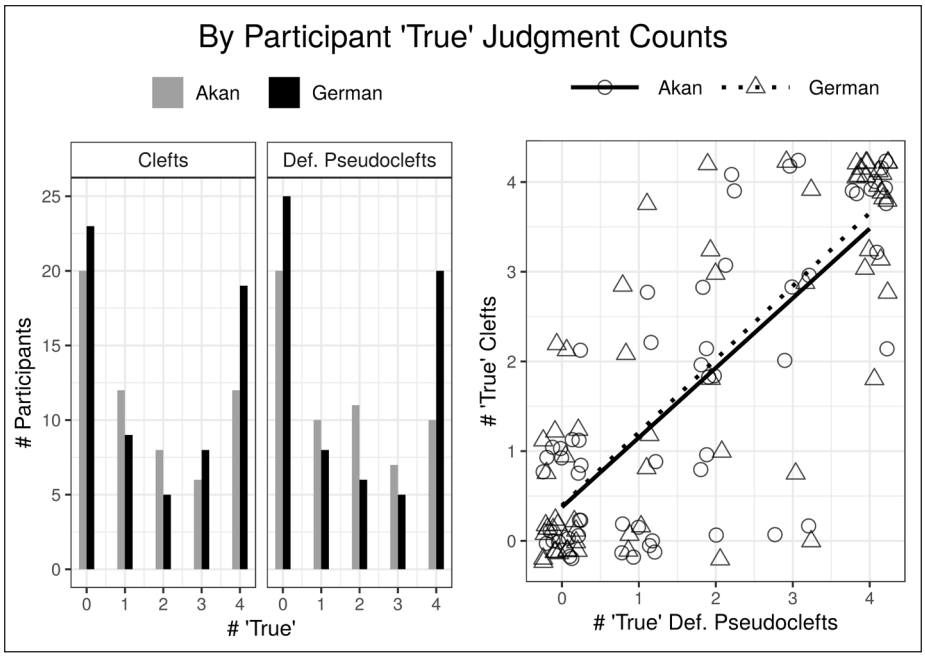

Figure 5: 'True' responses for 122 participants in the cleft and pseudocleft conditions for the critical combinations [+VER, –EXH] and [+FAL, +CAN]. *Left*: counts of participants per total number of 'true' judgments made (out of 4 total per participant). *Right*: each circle (Akan) and triangle (German) represents an individual participant's counts of 'true' judgments for definite pseudoclefts (x-axis) and clefts (y-axis), with the lines showing a positive correlation.

and the x-axis the counts for definite pseudoclefts, going from 0 to 4, and each point (jittered) represents an individual participant. The circles (Akan) and triangles (German) in the upper right corner show the participants who judged clefts and definite pseudoclefts as 'true' 4/4 times (*non-exhaustive* responders), while those in the bottom left corner show participants who judged the sentence types as 'true' 0/4 times (*exhaustive* responders). The two lines show the positive correlation between the two sentence types.

In order to obtain participant-specific inferences and correlations in sentence type judgments from the statistical model reported in Section 3.2.2, Model 1 was refit as a zero-intercept model and the distribution of participant estimates was inspected. In particular, I aim to see whether—despite few data points per individual and shrinkage in the mixed-effects model (i.e., strength borrowed from the intermediate response at the population level, making extreme values less likely)—most participants are still expected to have largely positive/negative responses, or whether a mid-range response pattern is instead predicted from the model. Samples from the posterior distribution were obtained, and the by-participant samples were converted into the probability scale for the plots here; see Section 2.3 "By-participant responses" in Document 1 of the supplementary materals for details about this model.

Figure 6 (German) and **Figure 7** (Akan) show the model estimates for the mean proportion of 'true' responses per participant plus 95% credible intervals—with solid lines indicating that the credible intervals do not cross chance (0.5) and dashed lines indicating that they do. Participants along the y-axis are ordered by the predicted means (x-axis) of the cleft condition, and the plots are cut into tertiles by two vertical lines in each grid. Overall, visual inspection of the plots suggests that, although the model still predicts a high number of exhaustive and non-exhaustive responders for clefts and definite pseudoclefts, there is high uncertainty in the model estimates for many participants—and more so for the Akan participants in comparison to the German participants. Looking first at the exclusive condition in both languages, one can see that all participants are predicted to have mean proportions of 'true' responses—along with most credible intervals—within the first tertile (exhaustive responders), although for Akan participants slightly more variability is found. The canonical condition, by contrast, showed higher variability in both languages, although the majority of participants (German: 50/64 participants; Akan: 43/58 participants) have mean proportions of 'true' responses within the third tertile (non-exhaustive responders).[19]

[19] Six participants in German and one participant in Akan are predicted to judge canonical sentences as strictly exhaustive ('not true') with narrow credible intervals not crossing chance; moreover, a small group of participants are similarly predicted to interpret canonical sentences as exhaustive, albeit with higher uncertainty. In fact, there was a weak positive correlation for clefts and canonical sentences ($r = 0.60$, CrI: [0.39, 0.76]). This is seen in **Figures 6** and **7**: participants who judged canonical sentences exhaustively are generally clustered at the low end of the y-axis, and vice versa for non-exhaustive responses. Note that in the engagement check, all seven of these participants judged the four target sentences as 'true' 100% of the time in the [+VER, +EXH] condition, as expected; cf. the left plot in **Figure 3**. That is, the exhaustive responses are not due to a general strategy of responding 'false' to the experimental stimuli. A discussion of this variation in the canonical condition is beyond the scope of this paper.

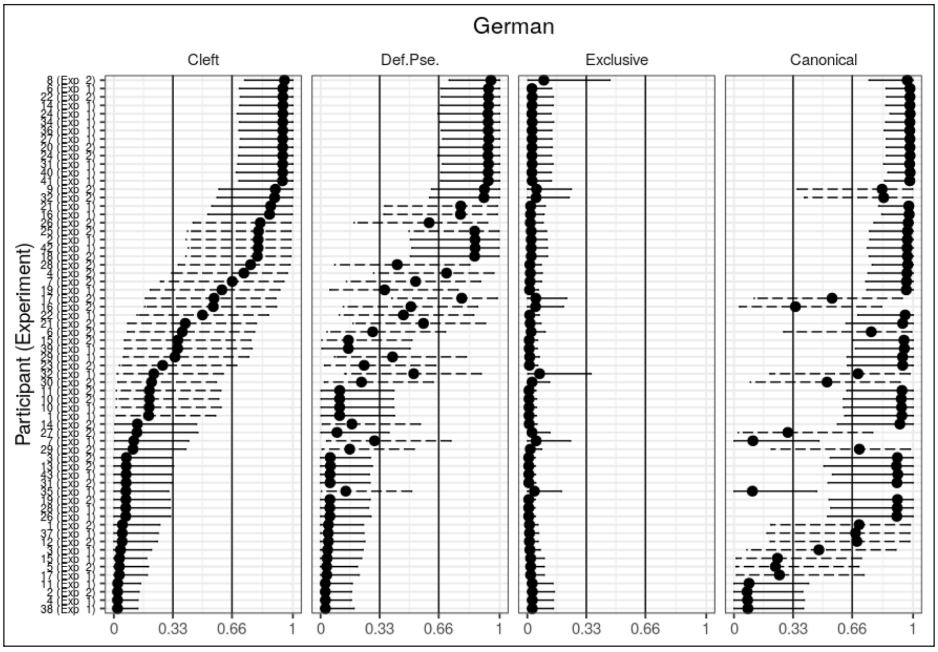

Figure 6: German: Model-predicted by-participant means and 95% credible intervals for all four sentence types in both experiments, with participants on the y-axis ordered for the cleft condition. Error bars with solid lines indicate the credible intervals do not cross chance (0.5), dashed lines indicate they do. The two vertical lines in each grid cut the plots into tertiles.

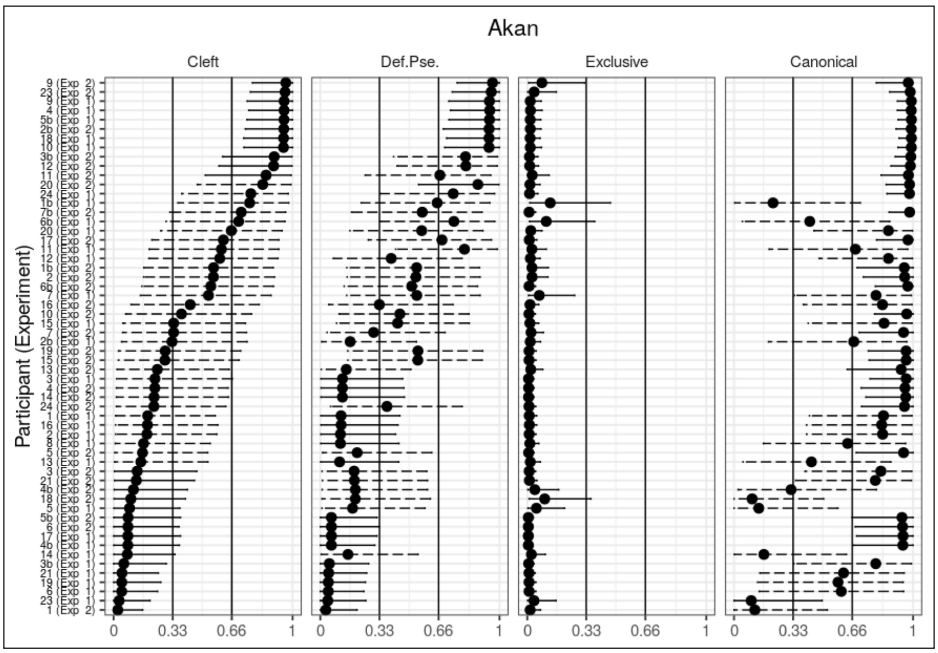

Figure 7: Akan: Model-predicted by-participant means and 95% credible intervals for all four sentence types in both experiments, with participants on the y-axis ordered for the cleft condition. Error bars with solid lines indicate the credible intervals do not cross chance (0.5), dashed lines indicate they do. The two vertical lines in each grid cut the plots into tertiles.

Turning now to the main conditions of interest: For German clefts (**Figure 6**), participants are largely projected to be either exhaustive or non-exhaustive responders—with the predicted means for the majority of participants in the first and third tertile, largely at the extremes, and roughly 2/3 having credible intervals clearly on one side of the scale (cf. the post hoc analysis in De Veaugh-Geiss et al. 2018: §3.3, albeit employing different methods). Clefts in Akan generally exhibit a similar shape (**Figure 7**). That said, there are proportionally fewer non-exhaustive responders, and moreover, there is more gradience in Akan from exhaustive to non-exhaustive responders—with most participants having very broad credible intervals indicating uncertainty in the directionality of the predicted response. Nevertheless, for both languages there is a considerable subset of participants for whom clefts are predicted to be judged non-exhaustively; moreover, a similar distribution of individual responses is found for definite pseudoclefts. In fact, for the cleft and definite pseudocleft conditions there is a very strong positive correlation found in the model ($r = 0.90$, CrI: [0.80, 0.97]): that is, when exhaustive or non-exhaustive responses are predicted for clefts, the same is predicted for pseudoclefts. To sum up: Model 1 predicts a broad range of individual responses, including many non-exhaustive responders, and a strong positive correlation in judgments for clefts and pseudoclefts.

4 Discussion

It is crucial to note right off the bat that the absence of evidence is not equal to evidence of absence, yet the critical findings reported are the null effects in the primary comparisons of interest. In this section I discuss these results as well as the by-participant response patterns with respect to the theoretical approaches discussed in Section 2.2.4, with a particular focus here on non-maximality and non-exhaustivity. Returning to the three main research questions, repeated here in brief:

- **Q1** *Cross-linguistic variability*: Are clefts or definite pseudoclefts strongly exhaustive in Akan, in contrast to their counterparts in German?
- **Q2** *Inter-argument/inter-sentential variability*: In Akan, do object clefts exhibit a difference in exhaustivity compared to (i) subject clefts and (ii) definite pseudoclefts for either grammatical argument?
- **Q3** *Inter-speaker variability*: Do Akan participants show variability in individual response patterns for clefts and pseudoclefts, with groups of exhaustive and non-exhaustive responders, as reported for German?

For research question **Q1**, I entertained the hypothesis that one language might conventionally-code exhaustivity in clefts/pseudoclefts, whereas another might not, as has been proposed for other languages and phenomena. For the SEMANTIC DEFINITE camp, exhaustivity is hard coded in both sentence types and thus clefts and pseudoclefts are expected to give rise to a strong exhaustive

inference—a point I return to below—but this is not what was found for either language. For research question **Q2**, I investigated whether exhaustivity differs across grammatical arguments in clefts and pseudoclefts in Akan; however, there is a lack of evidence for such a difference from the data. Finally, in response to research question **Q3**: just as in German, Akan was found to have groups of both exhaustive and non-exhaustive responders. In the remaining discussion, I will focus on the lack of evidence for a strong exhaustive inference in both sentence types across both languages, at least that found for a subset of participants. In light of these results, I will explore both the SEMANTIC DEFINITE and DISCOURSE PRAGMATIC accounts further. Specifically, I consider non-maximality and the factors relevant for tolerating homogeneity violations, as well as (non-)exhaustivity from the perspective of the discourse pragmatic approaches.

4.1 Non-maximality and (non-)exhaustivity

It has been noted in the literature that there are situations in which maximality/homogeneity violations may in fact be tolerated, referred to as non-maximality (e.g., Brisson 1998; Lasersohn 1999). For example, the sentence '*The professors smiled*' can be felicitously uttered in a situation with nine smiling professors and one neutral professor (example from Križ 2016). In Križ 2016 this is modeled by means of a post-semantic principle resulting in a sentence which is 'true enough' (cf. 'pragmatic halos' in Lasersohn 1999). Non-maximal interpretations are noted to depend on several contextual factors, though. These include, for instance, the (i) number of entities in the relevant domain (Brisson 1998; Brogaard 2007), (ii) the degree of contextual inconsistency (e.g., if the one neutral professor is instead visibly angry, "we are less inclined to still accept the sentence as true"; Križ 2016: p. 497), and (iii) discourse irrelevance (Lasersohn 1999; Križ 2016). Assuming non-exhaustive responders obtained a non-maximal interpretation, the results here could arguably be compatible with the semantic definite approaches; however, I argue that none of these factors giving rise to non-maximality are at play in the experimental set-up here.

Considering the number of entities (e.g., many vs. few entities under consideration) or degree of violation (e.g., neutral vs. visibly angry), the experiments here are not environments in which non-maximal interpretations are expected. The domain of alternatives was fixed to only four roommates, all of whom were relevant across the entire experiment. Furthermore, the violation was stark: with the predicate satisfied by not one, but two individuals (i.e., the violation), the context is unambiguously inconsistent with the exhaustive inference. In addition, it is hard to explain away the tolerance for exhaustivity violations in terms of discourse irrelevance. Consider example (26) below from Križ (2015), in which the discourse goal makes the father's contribution unimportant in the context: that is, the conversation "is to establish who gets the credit for the creation of the model plane [and] it is perfectly plausible for the father to give all the credit to the child" (p. 119).

(26) Context: Little Sandy built a model plane together with her father.
A: Who built that wonderful model plane?
B: It was Sandy who built it!

[Ch. 4, ex. (23) in Križ 2015]

By contrast, in the experiments here the focal alternatives were unordered with respect to one another (i.e., proper names with no further specification) to exclude having any logical or contextually-supplied scales; moreover, given the uncover-first-judge-later strategy, Akan participants clearly found all entities in the domain relevant for inspection. In short, contextual factors providing 'pragmatic slack' for non-maximal readings are not applicable here.[20] Moreover, there are two analyses for which both exhaustive and non-exhaustive interpretations are in fact expected.

Titov (2019) argues *nà*-clefts are inverse pseudoclefts which involve quantification over an alternative set, with the (non-)exhaustive interpretation depending on the type of focal exclusion, contrastive or exhaustive.[21] It is thus possible that—when the cleft appears out-of-the-blue—participants have either interpretive option, resulting in variability in exhaustive responses. Under this approach, when opting for a 'false' judgment, participants are assumed to have taken the cleft to be exhaustive; and when opting for a 'true' judgment, contrastive (cf. Destruel & Velleman 2014; Destruel & Beaver & Coppock 2019). Consider, for instance, the sentence '*It is* ANAN *who Yaa kicked out*'. The alternatives to the focused constituent 'Anan' (here, Kwaku, Kofi, Kwame) are under consideration for fulfilling the background λx[Yaa kicked out *x*] and turning it into a true proposition. For a non-exhaustive responder, once it is revealed that Yaa kicked out Kwame, the participant may conclude that the exhaustive interpretation is odd. For the contrastive interpretation, at least one member of the alternative set is considered and rejected; cf. (15a). Since in the context it is stated that Yaa did something other than kick out Kwaku and Kofi, a participant may conclude that the propositions '*Yaa kicked out Kwaku*' and '*Yaa kicked out Kofi*' can be rejected, resulting in the sentence being judged true under a contrastive interpretation. Titov (2019: p. 16) posits that "in the absence of a contextually licensed contrastive interpretation, [an] exhaustive interpretation is strongly favoured". Although such a

[20] As one anonymous reviewer noted, there is considerable variability in the results in the experimental literature on non-maximality. For instance, in a study with definite plurals in a comparable binary truth-value judgment task, Schwarz (2013) tested contexts with nine entities in the visual display. Schwarz remarked that "maximal [response choices] are clearly preferred overall", with only 20–30% non-maximal 'true' judgments depending on the condition (pp. 521–2). In another study, again on definite plurals with nine entities in the display, Križ & Chemla (2015) instead offered various response options across different experiments, including 'completely true'/'not completely true' as well as 'completely false'/'not completely false'. In contrast to Schwarz (2013), for example, in one of the studies the authors report a high number of 'not completely false' responses (>75%) corresponding to a non-maximal interpretation, which was replicated across other versions of the experiment. (By-participant results were not reported in either.)

[21] I am thankful to the anonymous reviewer for the suggestion of spelling out this proposal in detail.

strong preference was not found, at least not for a subset of the population, both interpretations are in fact available under this approach, which can directly account for the non-exhaustive responders reported here.

The anaphoricity-driven analyses in Pollard & Yasavul 2016 and De Veaugh-Geiss et al 2018 do not rely on the exclusion of focal alternatives; rather, the main idea is tied to the observation that clefts/pseudoclefts come with an anaphoric existence presupposition, and this presupposition must either (i) be bound when an antecedent is present, or (ii) accommodated in the absence of an antecedent. In Section 1, I asserted that *nà*-clefts encode existence as a presupposition, just as their German counterparts. However, not all languages are argued to have an existential presupposition encoded in the cleft structure. For instance, it has been claimed that St'át'imcets and Nłe?kepmxcín do not encode existence as part of the meaning of clefts (Davis & Matthewson & Shank 2004; von Fintel & Matthewson 2008; Koch & Zimmermann 2010). Similarly, Grubic & Renans & Duah (2019). provide evidence that the West-Chadic language Ngamo carries no existence presupposition;[22] by contrast, they argue that clefts in Akan (as well as Ga, a Kwa language spoken in the Greater Accra Region of Ghana) do conventionally-code existence, which they take to be a presupposition.

Grubic & Renans & Duah (2019) support the claim that the existential is presupposed in *nà*-clefts by testing negated universal quantifiers in focus, as in (27).[23] The principal idea behind this test is: for the cleft, there is a clash between the existence presupposition that there is an α such that Kofi invited α and the assertion that there is no α that he invited. For definite pseudoclefts, as in (28), results are entirely parallel: the sentence was judged as odd by two native-speaker consultants.

(27) *Context*: Who did Kofi invite to the party?
#è-ǹ-yɛ́ òbíárá nà ɔ̀-frɛ́-èɛ́.
3.SG.INA.SBJ-NEG-be everybody/anyone FM 3.SG.SBJ-invite-PST
'*It was NOBODY that he invited.*' (*cleft*)
[ex. (60b) in Grubic & Renans & Duah 2019]

(28) #Nipa no a ɔ̀-frɛ́-ɛ́ ǹ-yɛ́ òbíárá.
person the who 3.SG.SBJ-invite-PST NEG-be anybody
'*The person who he invited was NOBODY.*' (*def.pse.*)

Thus, I follow Grubic & Renans & Duah (2019) and take Akan clefts and definite pseudoclefts to give rise to an existential presupposition.

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[22] Exploring the correlation between the non-conventionally-coded existential and the lack of a strong exhaustivity effect in clefts in St'át'imcets, Nłe?kepmxcín, and Ngamo is of high interest for future research.

[23] For the narrow focus construction with *nà*, it is necessary to include the copular plus negation, i.e., *ɛnyɛ* 'it is not' (see, e.g., Ofori 2011: §4.2 for clefting and negation).

This leads to anaphoricity in the two sentence types, illustrated in (29). The two sentence types in (29a)–(29b) presuppose an existential, i.e., that there exists a person *α* with property *P*. The indefinite *òbí* in the previous sentence in (29) introduces a discourse referent *α* with the same property *P*, and thus the existence presupposition will be dynamically bound by this discourse antecedent. Indeed, an Akan consultant suggests that the anaphoric interpretation is the only possible reading of (29a)–(29b).

(29) Òbí tɔ̀-ɔ̀ àtààdé ńnórà. …
someone buy-PST dress yesterday
'*Someone bought a dress yesterday. …*'

a. Kumi na ɔ̀-tɔ́-ɔ̀ àtààdé.
Kumi FM 3.SG.SBJ-buy-PST dress
'*It is Kumi who bought a dress.*' (*cleft*)

b. Nipa no a ɔ̀-tɔ́-ɔ̀ àtààdé ne Kumi.
person the who 3.SG.SBJ-buy-PST dress be Kumi
'*The person who bought a dress is Kumi.*' (*def. pse.*)

[adapted from ex. (21) in De Veaugh-Geiss et al. 2018]

The above are examples for when the existence presupposition is bound by an overt discourse antecedent; however, in the two experiments here the stimuli were presented out-of-the-blue and thus accommodation of the discourse antecedent was necessary (Lewis 1979). On the one hand, by taking the cleft/pseudocleft to be answering an implicit *wh*-question (cf. Roberts 2012), the existential can be resolved to the maximal discourse referent with the backgrounded property in question, resulting in an exhaustive interpretation; on the other hand, by resolving to a non-maximal discourse referent, such as an indefinite antecedent, a participant will obtain a non-exhaustive interpretation.

For both discourse pragmatic approaches, the experimental set-up here did not support one or the other interpretive strategy, and individuals may vary in strategies employed—even potentially across trials. Crucially, for these approaches there is no need to assume exceptional non-maximal interpretations (as for the semantic definite camp); rather, an exhaustive or a non-exhaustive interpretation is readily available for both sentence types.

5 Conclusion

In this paper I have presented two experiments on the exhaustivity inference in *nà*-clefts and definite pseudoclefts of the form '*Nipa no a* P *ne α*' ('The person who did *P* is *α*') in Akan, with a direct comparison to their counterparts in German using the same experimental set-up. The analysis presented here was an exploratory one given the unexpected uncover-first-judge-later response strategy employed by Akan participants. Nevertheless, despite the unforeseen response

patterns for Akan in the incremental information-retrieval paradigm used, results are compatible with a unified account to clefts and definite pseudoclefts cross-linguistically for Akan and German. Although this is a modest contribution to the debate on cleft exhaustivity, the studies and discussion here open up several paths forward. One research direction could further explore variables that modulate tolerance of a maximality/homogeneity violation, such as the number of alternatives under consideration or discourse irrelevance, in order to better understand how non-maximality interpretations in definite plurals may relate to non-exhaustivity in clefts and pseudoclefts. Alternatively, studies exploring contexts which may or may not support contrastive construal, or presenting clefts and pseudoclefts as addressing an explicit *wh*-question, may clarify which factors are relevant for (non-)exhaustive interpretations. Finally, further investigations into the existential presupposition, or lack thereof, with respect to exhaustivity effects could reveal critical correlations that shed light on the source of cleft exhaustivity. Whichever path is taken, the studies and discussion here provide a stepping stone for future theoretical and experimental work on the hotly debated topic of (pseudo)cleft exhaustivity in Akan and beyond.

Abbreviations

1/2/3 = first/second/third person, ANI/INA = animate/inanimate, DET = determiner, FM = focus marker, NEG = negative, PRT = particle, PRS/PST = present or habitual/past or completive (with the use of this glossing I wish to remain neutral with respect to aspectual reference), SBJ/OBJ = subject/object, SG/PL = singular/plural. I have followed standard practice and used * and # to mark syntactic and semantic/pragmatic unacceptability, respectively, and ? to mark uncertainty or questionability.

Supplementary Files

Supplementary files are available at the following repository: https://zenodo.org/record/5203230#.YW2HkCXLeuI (DOI: https://doi.org/10.5281/zenodo.5203230). The supplementary materials include the following:

- "Supplement to 'nà-Cleft (non-)exhaustivity: Variability in Akan' (Document 1)", which provides a summary of the data and analysis (CC BY 3.0);
- "Supplement to 'nà-Cleft (non-)exhaustivity: Variability in Akan' (Document 2)", which presents background information about the cleft structure in Akan as well as the stimuli presented to participants in the incremental information-retrieval paradigm (CC BY 3.0);
- the 128 auditory files for the target and control items (CC BY-NC-SA 3.0); and
- the data set for the target and control conditions (CC0 1.0).

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Competing Interests

The author has no competing interests to declare.

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