An unexceptional semantics for expressions of exception[1]

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1 The puzzles of *but*-exceptives

This paper focuses on two puzzles posed by exceptive phrases formed with *but*. First, the *entailment puzzle*. The sentence in (1) entails (a) that John did not come, and (b) that every other student came. I will refer to (a) as the *negative entailment*, and (b) as the *otherness entailment*.

(1) Every student but John came.
  a. $\neg$came(John)(w_0) b. $\forall$x [(student(x)(w_0) & x $\neq$ John) $\rightarrow$ came(x)(w_0)]

Second is the *distribution puzzle*: *but*-exceptives can occur with universal quantifiers, as in (2), but are ungrammatical otherwise, including with *some* (3a), numerals (3b), proportional quantifiers (3c), and definites (4) (see Gajewski 2008 for additional complications).

(2) {every, all the} student(s) but John came.
(3) *{(a) some, (b) three, (c) most} student(s) but John came.
(4) *The students but John came.

Building on ideas in von Fintel (1993), Gajewski (2008, 2013) proposes a general framework for resolving these puzzles. The framework has three components: (i) *but* itself denotes a type of subtraction; (ii) alternatives to the complement of *but* are activated; and (iii) these alternatives are obligatorily "used up" by a higher strengthening operator. Given Gajewski's framework, exceptives become a testing ground for two questions of general importance. **Q1:** how are alternatives computed? And **Q2:** what is the inventory of strengthening operators?

This paper tackles these questions. Natural answers involve machinery familiar from other domains. Regarding Q1: alternative computation in *but*-exceptives could proceed according to an algorithm independently proposed for computation of focus alternatives (Rooth e.g. 1992, Fox & Katzir 2011). Regarding Q2: the strengthening operator could be the exhaustivity operator familiar from work on scalar implicatures (Chierchia 2006; Fox 2007; Chierchia, Fox, & Spector 2009). I refer to these answers together as the ***unexceptional hypothesis***.

Gajewski considers the unexceptional hypothesis, but shows that it runs into a problem in accounting for the ungrammaticality of the examples in (3). He thus rejects the unexceptional hypothesis in favor of different methods of alternative computation (Gajewski 2013) and strengthening (Gajewski 2008). The present paper, however, attempts to defend the unexceptional hypothesis. I propose a resolution to the problem Gajewski points out, and furthermore extend the approach to account for the deviance of *but* with plural definites, as in (4).

2 *But* as subtraction

A leading idea in early work on exceptives (e.g. Hoeksema 1987, von Fintel 1993) is that *but* has as a component of its meaning subtraction. In (1), *but* subtracts John from the set of students to yield as the restrictor of *every* the set of students who are not John.

To formalize this, I will make the structural assumption that *but John* forms a constituent and attaches within the restrictor of *every*. The structure for *every student but John* is given in (5):

(5) [every [student but John]] came

Semantically, I define *but* as in (6a) (cf. Thomas 2011 on *other*). *But* takes as its arguments

[1] I am grateful to Kai von Fintel, Danny Fox, Martin Hackl, Irene Heim, David Pesetsky, Roger Schwarzschild, Florian Schwarz, and the audience at PLC 39. All errors are, of course, my own. I receive partial financial support from the Social Sciences and Humanities Research Council of Canada.

an atomic or plural individual, X, and a predicate of individuals, f. *But* returns a new predicate characterizing the set of atomic and plural individuals that satisfy f and do not *overlap* with X. Per (6b), two individuals overlap just in case they have some subpart in common.

(6) a. $[[\text{but}]] = \lambda X . \lambda Y . \neg \text{Overlap}(X, Y)$ b. $\text{Overlap}(X, Y)$ iff $\exists z\ [z \leq X \ \&\ z \leq Y]$

Given the denotation for *but* in (6a), consider how composition proceeds in (5). *But* takes *John* as its first argument and yields the characteristic function for the set of individuals which do not overlap with John, i.e. the set of individuals that do not contain John as an atomic subpart, (7).

(7) $[[\text{but John}]] = [[\text{but}]](\text{John}) = \lambda Y . \neg \text{Overlap}(\text{John}, Y)$

But John composes with *student*, which I take to denote the characteristic function for the set of atomic students. *Student* and *but John* compose via Predicate Modification to yield the characteristic function for the set of atomic students which do not overlap with John — i.e. the set of students who are not John, (8a). *Student but John* is the restrictor of *every* and *came* its scope, resulting in the truth-conditions in (8b): (5) is true just in case every student who is not John came.

(8) a. $[[\text{student but John}]]^w = \lambda x . \text{student}(x)(w)\ \&\ \neg \text{Overlap}(\text{John}, x)$
b. $[[(5)]]^w = 1$ iff $\forall x\ [(\text{student}(x)(w)\ \&\ \neg \text{Overlap}(\text{John}, x)) \rightarrow \text{came}(x)(w)]$

Subtraction cannot, however, be all there is to *but*-exceptives, since subtraction does not offer a resolution to either the entailment puzzle, or the distribution puzzle. The truth-conditions in (8b) perfectly capture the otherness entailment in (1b), but fail to capture the negative entailment in (1a). These truth-conditions are silent about whether or not John came: they are verified both in a scenario where every student who is not John came and John didn't come, as well as in a scenario where every student who is not John came and John came too. To capture the negative entailment, the truth-conditions must be enriched so that they are verified only in the former case.

The sentence in (9) illustrates the failure to capture the distribution puzzle: although the sentence in (9) is deviant, the truth-conditions predicted for (9) given the denotation for *but* in (6a) are not pathological: (9) is predicted to be true just in case some student who is not John came.

(9) *Some student but John came.

3 The unexceptional hypothesis

I spell out the unexceptional hypothesis, and demonstrate how it can account for the negative entailment, and nearly resolve the distribution puzzle. This section substantively follows the "first attempt" analysis in Gajewski (2013) with certain modifications along the way.

3.1. Alternative computation: focus

Following Gajewski (2008), I assume that the complement of *but* is F(ocus)-marked, as in (10). Alternative computation in exceptives thus reduces to computation of focus alternatives.

(10) $[[\text{every [student but John}_F]]\ \text{came}]$

In Rooth (e.g. 1992), focus alternatives are computed by replacing an F-marked constituent with any element of like semantic type. Fox & Katzir (2011), however, demonstrate that this approach predicts too many alternatives, and instead adopt an algorithm for alternative computation based on *structural complexity*: alternatives are computed by replacing an F-marked constituent with constituents that are at most equally complex as it. In particular, the F-marked constituent is replaced by (i) its own sub-constituents, and (ii) elements from the lexicon.[2]

[2] This is a slight simplification of Fox & Katzir's proposal; I refer the reader to their paper for more details.

Following Fox & Katzir, alternatives in (10) are derived by replacing *John* with elements of at most equal structural complexity to *John*. Since *John* does not contain any sub-constituents, the replacements come from the lexicon: alternatives are of the form in (11a), where *a* is some lexical element. For instance, replacing *John* by *Mary* derives the alternative in (11b), and by *Bill* the alternative in (11c). (11d) is not an alternative, since *John and Mary* is more structurally complex than *John*. I refer to all alternatives of the form in (11a) as the *formal alternatives* to (10).[3]

(11) a. Every student but *a* came. b. Every student but Mary came.
c. Every student Bill came. d. Every student but John and Mary came.

3.2. Strengthening operator: Exh

By the unexceptional hypothesis, *but* obligatorily co-occurs with the exhaustivity operator (Exh). As defined in (12) from Fox (2007), Exh is a two-place operator which takes a proposition as its first argument ('prejacent'), and a set of alternatives as its second argument.

(12) $[[\text{Exh}]]^{w}(\text{ALT})(p_{st}) \Leftrightarrow p(w) \;\&\; \forall q\, [q \in \text{IE}(p, \text{ALT}) \rightarrow \neg q(w)]$

(13) a. $\text{IE}(p, \text{ALT}) = \cap\{\text{ALT}' \subseteq \text{ALT} : \text{ALT}' \text{ is a maximal set of ALT s.t. } \text{ALT}'^{\neg} \cup \{p\} \text{ is consistent}\}$
b. $\text{ALT}'^{\neg} = \{\neg p' : p' \in \text{ALT}'\}$

Exh asserts a conjunction. The first conjunct asserts the truth of the prejacent at the actual world. The second conjunct asserts the falsity of all *innocently excludable* alternatives — those alternatives that are in every maximal subset of ALT where all members of the subset can be negated without introducing a contradiction, (13). Modulo discussion in Gajewski (2012), innocent exclusion makes Exh immune to contradiction. In incorporating innocent exclusion into the definition of Exh, I depart from Gajewski's implementation of the unexceptional hypothesis.

The updated structure for (1) is (14): *but* occurs with Exh, which takes propositional scope.

(14) Exh [[every student but John_F] came]

The prejacent of Exh is the proposition computed by intensionalizing the meaning in (8b), as in (15). The first conjunct of Exh's meaning introduces the entailment that this proposition is true at the actual world: it is true at the actual world that every student who is not John came. In this way, the otherness entailment is introduced.

(15) $\lambda w\,.\,\forall x\,[(\text{student}(x)(w) \;\&\; \neg\text{Overlap}(\text{John}, x)) \rightarrow \text{came}(x)(w)]$

As developed in the following, the negative entailment results from the second component of Exh's meaning, where elements of ALT are negated. Here, I will introduce a starting assumption about the composition of ALT. ALT is a subset of the formal alternatives to the prejacent of Exh whose make-up is determined by context. I take it that the context provides a set of individuals C. For every atomic student (cf. fn. 3) in C, ALT contains an alternative where that student is the argument of *but*. Where the students in C are {John, Mary, Bill}, ALT contains (11b-c) above.

3.3. Capturing the negative entailment

How is the negative entailment derived? Take a concrete scenario with three students: John, Mary, and Bill. To satisfy the otherness entailment, it must be that Mary and Bill came. This leaves two possibilities: (i) Mary and Bill came, but John didn't, and (ii) Mary, Bill, and John all came. For the negative entailment to be captured, the sentence must be true in (i), but not (ii).

To see that this follows from exhaustification, it is only necessary to consider one alternative. Take (11b), which expresses the proposition in (16): that every student who is not Mary came.

[3] The set of formal alternatives also includes alternatives like *every student but the table came*, where *John* is replaced by an individual that is not a student. I will make the simplifying assumption that these alternatives are pruned because subtraction is vacuous, and will not consider them further.

Exh negates (16), which introduces an entailment that it is *not* the case that every student who is not Mary came. In other words, some student who is not Mary did not come. This entailment is met in (i), where John did not come, but is not met in (ii), where all of the students came.

(16) $\lambda w . \forall x\ [(\text{student}(x)(w)\ \&\ \neg\text{Overlap}(\text{Mary}, x)) \rightarrow \text{came}(x)(w)]$

3.4. Almost resolving the distribution puzzle

The idea pursued in von Fintel (1993) and Gajewski (2002, 2008, 2013) is that contradictions necessarily arise when a *but*-exceptive occurs with a non-universal quantifier, and that sentences register as ungrammatical when they are necessarily contradictory. Since I have assumed that Exh only negates innocently excludable alternatives, appeal to contradiction will need to be re-thought.

The key move is to constrain the distribution of Exh. Following Fox & Spector (2009), Gajewski (2013), and Spector (2013), I adopt a constraint which prohibits Exh from applying when it cannot negate any alternative:

(17) **NON-VACUITY**
Exh[A] is infelicitous if Exh[A] is equivalent to A.

With this constraint in place, consider again the sentence in (18a), where *but* occurs with existential *some*. The analysis attributes to (18a) the structure in (18b). To see the effect of the constraint, suppose that C contains the individuals a_1-a_n so that the contextually salient alternatives to the prejacent are those shown in (19).

(18) a. *Some student but John came. b. Exh [[some student but John_F] came]
(19) a. Some student but a_1 came.
b. Some student but a_2 came.
c. …
d. Some student but a_n came.

The prejacent of Exh in (18b) says that some student who is not John came. It follows from this that a_1 came, or a_2 came, and so forth to a_n, as stated in (20).

(20) $\text{came}(a_1) \vee \text{came}(a_2) \vee \ldots \vee \text{came}(a_n)$

Consider what happens if Exh were to negate all of the alternatives in (19), focusing on (19a) and (19b). (19a) says that some student who is not a_1 came. Negating this introduces the entailment that *no* student who is not a_1 came. This means that John did not come, and a_2 did not come, and a_3 did not come, and so forth, as stated in (21).

(21) $\neg\text{came}(\text{John})\ \&\ \neg\text{came}(a_2)\ \&\ \neg\text{came}(a_3)\ \&\ \ldots\ \&\ \neg\text{came}(a_n)$

(19b) says that some student who is not a_2 came. Negating this introduces the entailment that *no* student who is not a_2 came. This means that John did not come, and a_1 did not come, and a_3 did not come, and so forth, as stated in (22):

(22) $\neg\text{came}(\text{John})\ \&\ \neg\text{came}(a_1)\ \&\ \neg\text{came}(a_3)\ \&\ \ldots\ \&\ \neg\text{came}(a_n)$

A contradiction has arisen. (20) says that some student of a_1-a_n came. (21) and (22) together say that none of a_1-a_n came: both say that a_3-a_n did not come; (22) says that a_1 did not come; and (21) says that a_2 did not come. It follows that the alternatives in (19a) and (19b) are not innocently excludable — and, in a similar way, *none* of the alternatives in (19) are innocently excludable.

With no alternatives innocently excludable, the only contribution of Exh is to assert the truth of the prejacent, and accordingly, the LF with Exh in (18b), repeated as (23a), is equivalent to the one without Exh in (23b). NON-VACUITY thus rules out (23a), which is the only available LF for (18a), given that *but* obligatorily co-occurs with Exh.

(23) a. Exh [[some student but John] came] b. [[some student but John] came]

As said above, previous work has proposed that a sentence which is necessarily contradictory registers as ungrammatical. I assume that a sentence which is necessarily ruled out by pragmatic constraints also registers as ungrammatical. From discussion so far, it thus appears that the distribution puzzle is resolved: *but* is ruled out in (18a) by NON-VACUITY.

However, we have made an assumption which requires further scrutiny. This assumption has to do with the number of alternatives that there are to the prejacent. In particular, it is assumed in (19) that there are *multiple* alternatives: *John* is replaced by a_1 in (19a), by a_2 in (19b), and so forth. If there is only *one* alternative, however, (18a) is *not* ruled out by NON-VACUITY. This result is established in the next section, and means that NON-VACUITY is *not* sufficient to rule out (18a).

This issue was also noticed by Gajewski (in a slightly different way given that he does not assume innocent exclusion), and he takes it as sufficient cause to reject the unexceptional hypothesis. I, however, propose an approach to resolve the problem, which makes it possible to maintain the unexceptional hypothesis.

4 The singleton pathology: the problem and its resolution

Suppose that the only contextually salient alternative to the prejacent in (18b) is (24), as obtains if there are only two salient students: John and a_1.

(24) Some student but a_1 came.

As above, the prejacent introduces the entailment that some student who isn't John came. In the scenario with two students, this means that a_1 came, as in (25a). Negating the alternative in (24) introduces the entailment that no student who isn't a_1 came, which means that John didn't come, as in (25b). These two entailments are consistent: if a_1 came and John didn't, both are met.

(25) a. came(a_1) b. ¬came(John)

From the fact that the alternative in (24) can be negated without giving rise to a contradiction, it follows that this alternative is innocently excludable — and NON-VACUITY is thus respected.

Given this, NON-VACUITY by itself is *not* sufficient to rule out (22). Still, NON-VACUITY has an important effect: it requires that ALT contain only one alternative to the prejacent and, as noted, this is the case only if there are exactly two salient students. The issue can thus be cast as the following question: why is (18a) not acceptable in a scenario with exactly two salient students?

4.1. Resolving the problem

In a scenario with exactly two salient students, the restrictor of *some* in the prejacent in (18a) is a singleton. Informally, the set of students is {John, a_1}, and *but* subtracts John from this set to yield the singleton {a_1} as the restrictor for *some*.

Existential quantifiers are known to resist a singleton restrictor. Heim (1991) points out the deviance of (26a), where world knowledge tells us that someone must have only one biological father. (26b) with superlative *tallest* makes the same point, as there must be one tallest student in the class. I propose that existential quantification is constrained by the constraint in (27):

(26) a. #A father of the victim testified. b. #A tallest student in the class got an A.

(27) **ANTI-SINGLETON**
Existential quantification is infelicitous when the speaker and hearer can know that the restrictor of the existential is necessarily a singleton without knowing the extension of the restricting NP or the conversationally determined domain of quantification.[4,5]

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[4] The definition of ANTI-SINGLETON is sufficiently weak so as to allow for the possibility in a sentence like Heim's (1991) *Robert caught a 20 foot long catfish* that there is only one such catfish: it cannot be known that there is only one such catfish without knowing the actual extension of *20 foot long catfish*.

NON-VACUITY and ANTI-SINGLETON conspire to rule out (18a). Because NON-VACUITY requires that there be only one alternative to the prejacent, the interlocutors know that there must be exactly two salient students. Given this, they in turn know that the restrictor of *some* is a singleton without knowing the actual extension of *student but John*. ANTI-SINGLETON thus applies to render (18a) infelicitous. With (18a) felicitous in no context, it registers as ungrammatical.

4.2. Extending to numerals

The profile of the problem and its solution extends to other quantifiers. Consider *three*, first without an exceptive in (28a). *Three* characterizes the set of all three-membered pluralities, (28b), and composes with *students* to yield the characteristic function for the set of three-membered pluralities of students, (28c). This is taken as the restrictor of a covert existential quantifier. The result: the sentence is true just in case some three-membered plurality of students came.

(28) a. Three students came. b. [[three]] = $\lambda X . \#(X) = 3$
c. [[three students but John]] = $\lambda X . \#(X) = 3$ & students(X) & ¬Overlap(John, X)

But cannot occur with *three*, as in (29). The analysis predicts that NON-VACUITY is violated in (29) (proof omitted) — unless ALT contains just three alternatives to the prejacent. This obtains if there are exactly four salient students: John and a_1-a_3.

(29) a. *Three students but John came. b. Exh [[∃ three students but John$_F$] came]

The prejacent in (29) is (30a), which says that some three-membered plurality of students not overlapping with John came. With four students, this means that $a_1+a_2+a_3$ came, entailing (30b).

(30) a. [[∃ three students but John] came] b. came(a_1) & came(a_2) & came(a_3)

The three alternatives to the prejacent are in (31). Negating (31a) says that no three-membered plurality of students overlapping a_1 came. The only three-membered plurality of students not overlapping a_1 is John+a_2+a_3. Negating (31a) thus introduces an entailment that not all of John, a_2, and a_3 came, as in (32a). Negating (31b-c) introduces the entailments in (32b-c) in a similar way.

(31) a. three students but a_1 came b. three students but a_2 came c. three students but a_3 came
(32) a. ¬came(John) ∨ ¬came(a_2) ∨ ¬came(a_3)
b. ¬came(John) ∨ ¬came(a_1) ∨ ¬came(a_3)
c. ¬came(John) ∨ ¬came(a_1) ∨ ¬came(a_2)

The entailments in (30b) are (32a-c) are consistent: all are met if a_1-a_3 came and John didn't. It follows that the alternatives in (31) are all innocently excludable, so NON-VACUITY is respected.

Like with *some*, NON-VACUITY and ANTI-SINGLETON conspire to rule out (29a). Given the effects of NON-VACUITY, the interlocutors can know that there are exactly four salient students without knowing the actual extension of *three students but John*. With four students, the three-membered pluralities of students are: {John+a_1+a_2, John+a_1+a_3, John+a_2+a_3, a_1+a_2+a_3}. Subtracting *John* in the prejacent removes all pluralities overlapping John, yielding the singleton {a_1+a_2+a_3} as the restrictor for the covert existential — and ANTI-SINGLETON rules out (29a).

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[5] The effects of this constraint are in general similar to those of Heim's (1991) Maximize Presupposition. Heim suggests that *some* competes with *the*, which carries a uniqueness presupposition. If the uniqueness presupposition is satisfied, Maximize Presupposition requires use of *the*; *some* can thus occur only if the uniqueness presupposition is not satisfied, deriving the result that some resists quantifying over a singleton domain. Here, I opt for ANTI-SINGLETON since the application of Maximize Presupposition with exceptive constructions is not clear, as *but* cannot occur grammatically with *the* (**The student but John came.*). It may not be necessary for the competition between *some* and *the* that *the* be grammatical, but the ANTI-SINGLETON formulation makes it possible to remain neutral on this issue. Note that I leave as an open question why *the student but John came* is ungrammatical.

4.3. Extending to other quantifiers: most

Although ANTI-SINGLETON is formulated to apply only to existential quantifiers, the logic extends further. Consider (33a), with *most*. For there to be the appropriate alternatives to respect NON-VACUITY (proof omitted), (33a) must occur in a scenario where there are exactly two students (John, a_1) or a scenario where there are exactly three students (John, a_1-a_2).

(33) a. *Most students but John came. b. Exh [[most [students but John_F]] came]

Consider a scenario with two students (John, a_1). The prejacent in (33) is (34), which says that most students who are not John came. The only student who is not John is a_1. Assuming *most* means *more than half*, the prejacent is verified if a_1 came, leading to the entailment in (34b).

(34) a. [[most [students but John]] came] b. came(a_1)

The one alternative is (35a). Negating (35a) says that it is not the case that most students who are not a_1 came. Since the only student who is not a_1 is John, (35b) is entailed.

(35) a. [[most [students but a_1]] came] b. ¬came(John)

The entailments in (34b) and (35b) are consistent: if a_1 came and John didn't, both are met. It follows that the alternative in (35a) is innocently excludable, and NON-VACUITY is respected. While I must omit discussion to conserve space, the scenario with three students leads to a similar result: NON-VACUITY is respected, and it is entailed that a_1-a_2 came, and John didn't come.

In the scenario with two students, *most* in the prejacent is provided with a singleton restrictor. {John} is subtracted from {John, a_1} to yield {a_1} as the restrictor of *most*. In the scenario with three students, *most* in the prejacent is provided with a doubleton restrictor. {John} is subtracted from {John, a_1, a_2} to yield {a_1, a_2} as the restrictor of *most*. It can be shown independently that *most* is infelicitous in scenarios with these profiles. Consider (36a-b). There is necessarily one tallest student in (36a), and necessarily two biological parents in (36b), and *most* is infelicitous.

(36) a. #Most tallest students in the class got an A.
b. #Most of my parents came for a visit.

So, given NON-VACUITY, (33a) is restricted to two scenarios, and independent constraints on *most* rule out (33a) in these scenarios — ruling out the sentence entirely.

4.4. Interim summary

I have argued that the analysis of *but*-exceptives in Gajewski's framework can be achieved using *unexceptional* machinery: the complement of *but* is F-marked and alternatives are computed after Fox & Katzir (2011); these alternatives are used up by an exhaustivity operator. To resolve the distribution puzzle, I have invoked felicity constraints on the application of Exh (NON-VACUITY) and felicity constraints on the distribution of quantifiers (e.g. ANTI-SINGLETON).

5 A further layer of the distribution puzzle: plural definites

I turn now to a further layer of the distribution puzzle: that *but* cannot occur with plural definites. It is clear that the deviance of (37) links to the *but*-exceptive, as (37) contrasts with (38), where *but John* is replaced with a relative clause conveying a similar meaning.

(37) *The students but John came.
(38) The students who are not John came. *(awkward, but grammatical)*

The deviance of (37) is puzzling. Plural definites appear at first blush to have a parallel interpretation to universals and, as seen above, *but* can in general occur with universals. The parallel is established in (39), where (39a-b) seem to convey the same meaning.

(39) a. The students came. b. Every student came.

The question is: what difference is there between plural definites and universals that *but* interacts with? Brisson (1997) links the deviance of the exceptive in (37) to the fact that plural definites, unlike universals, are themselves tolerant of exceptions. (40a), for instance, can be true even if certain students did not participate in the raft building. Yet, if this were the whole story, (37) should improve in a context which rules out exceptions, contrary to fact in (40b).

(40) a. The students built a raft. b. The students (*but John) came — every last one of them.

I argue that the current analysis *predicts* the deviance of (37) once effects of presupposition are taken into account.

5.1. Homogeneity

Plural definites differ from universals in that they show a *homogeneity effect*. To illustrate, consider (41). *The students* denotes the maximal salient plurality of students. (41a) says that every atomic student in that plurality came. Importantly, (41b) does not simply deny that every student came; it says that *no* students came.

(41) a. The students came. b. The students didn't come.

This is the homogeneity effect: predicating of a plural definite yields true just in case *every* atomic element of the plurality satisfies the predicate, and false just in case *no* atomic element satisfies the predicate. If some atomic elements satisfy the predicate and others not, the predication yields neither true nor false. While the analysis of homogeneity is controversial, one approach is to encode homogeneity as a presupposition (Schwarzschild 1993, Löbner 2000), as I will assume.

5.2. Accounting for the deviance of (37)

The current analysis attributes to (37) the structure in (42). For the plural *students* to be felicitous in the prejacent, there must be at least two students who are not John (a_1-a_n).

(42) Exh [the [students but John_F]] came]

The prejacent is given in (43a), where *the students but John* denotes the maximal plurality of salient students who are not John ($a_1+a_2+\ldots+a_n$). Given homogeneity, the prejacent says that every atomic student in this plurality came. Since the first component of Exh's meaning is to assert the truth of the prejacent, (42) entails that a_1 came, and that a_2 came and so forth, as in (43b).

(43) a. [[the [students but John]] came] b. came(a_1) & came(a_2) & … & came(a_n)

The alternatives are given in (44). The critical observation is that each alternative contains a plural definite and thus a homogeneity presupposition is triggered in each alternative. I suggest that these homogeneity presuppositions project, and show that the deviance of (37) follows.[6]

(44) a. [[the [students but a_1]] came]
b. [[the [students but a_2]] came]
c. …
d. [[the [students but a_n]] came]

To see the problem, consider (44a-b). *The students but a_1* in (44) denotes the maximal

[6] I am grateful to Irene Heim for pointing this out to me.

plurality of students who are not a_1 (John+a_2+…+a_n). Similarly, *the students but a_2* in (44b) denotes the plurality of students who are not a_2 (John+a_1+a_3+…+a_n). Given homogeneity, if Exh negates (44a-b) entailments are introduced that each atomic element of these pluralities did not come: negating (44a) entails (45), and negating (44b) entails (46).

(45) $\neg$came(John) & $\neg$came(a_2) & $\neg$came(a_3) & … & $\neg$came(a_n)
(46) $\neg$came(John) &$\neg$came(a_1) & $\neg$came(a_3) & … & $\neg$came(a_n)

A contradiction has arisen. The prejacent entails that all of a_1-a_n came, (43b). Taken together, negating (44a-b) entails that none of a_1-a_n came: negating each one entails that a_3-a_n did not come; negating (44b) entails that a_1 did not come, (46), and negating (44a) entails that a_2 did not come, (45). Hence, neither alternative is innocently excludable.

Although not proven, this extends to every other alternative in (44) as well with the result that Exh in (42) negates no alternatives, and (42) is ruled out by NON-VACUITY. So, the deviance of (37) is an effect of the homogeneity presupposition of plural definites coupled with NON-VACUITY.

6 Towards an analysis of *other than*

To conclude the paper, I briefly consider exceptive phrases formed with *other than*, which differ from those formed with *but* in two ways. First: *other than* does not introduce a negative entailment. This is illustrated with (47): (47) entails that every student other than John came, but does not entail that John did not come. Both (47a) and (47b) are acceptable continuations for (47). Second: *other than* can occur with non-universal quantifiers, as in (48).

(47) Every student other than John came. a. And John didn't come. b. And in fact John came too.
(48) Some student(s) other than John came.

According to the current analysis, the negative entailment (section 3.3) and distributional restrictions (sections 3.4-4) of *but*-exceptives both link to exhaustification. As such, the current analysis provides a natural way of understanding the relationship between *other than* and *but*. *Other than*, like *but*, denotes subtraction, as in (49). The difference is in exhaustification: whereas *but* obligatorily co-occurs with Exh, *other than* does not.

(49) [[other than]] = [[but]] = λX . λY . $\neg$Overlap(X, Y)

Comparing (1) with *but* to (47) with *other than*, the LF for (1) is (50a) with Exh, while there is an available LF for (47) without Exh, as in (51a). Whereas (50a) has both the negative entailment and the otherness entailment, (51a) has only the otherness entailment: (51a) yields true just in case every student who isn't John came, and so is compatible with both (47a-b). Similarly, (52a) is an available LF for (48), and is perfectly acceptable with the entailment in (52b).

(50) a. Exh [every student but John came]
b. $\neg$came(John)(w_0) c. $\forall$x [(student(x)(w_0) & x $\neq$ John) $\rightarrow$ came(x)(w_0)]
(51) a. [every student other than John came] b. $\forall$x [(student(x)(w_0) & x $\neq$ John) $\rightarrow$ came(x)(w_0)]
(52) a. [some student other than John came] b. $\exists$x [student(x)(w_0) & x $\neq$ John & came(x)(w_0)]

Given this analysis, a question arises: are *other than*-exceptives *never* exhaustified, or are they *optionally* exhaustified? Building on Chierchia et al. (2009), I probe for the possibility of Exh by embedding (47) in a disjunction and capitalizing on an independent constraint on disjunction: Hurford's (1967) Constraint (HC), which holds that a disjunction is infelicitous if one disjunct entails the other. HC is violated in (53), for instance, since the second disjunct entails the first.

(53) #John was born in France or in Paris.

To test for whether *other than* optionally co-occurs with Exh, consider the disjunction in (54):

(54) Either **every student other than John came**, or every student came including John.

If the first disjunct in (54) is parsed without Exh, HC is violated: the first disjunct says that every student who is not John came, which is entailed by the second disjunct. If the first disjunct is parsed with Exh, HC is respected: the first disjunct additionally carries the negative entailment that John did not come, which is not entailed by the second disjunct. The empirical fact is that (54) is perfectly felicitous — indicating that a parse with Exh is available. Hence, I suggest that *but* obligatorily occurs with Exh while *other than* optionally occurs with Exh.

Note that (55), unlike (54), is infelicitous, and this is correctly predicted. Because Exh is blocked with *some*, the only available parse of the first disjunct in (55) is without Exh. The first disjunct says that some student who is not John came, which the second disjunct entails, leading to a violation of HC. The distribution of HC violations ((54) vs. (55)) tracks the distribution of Exh.

(55) #Either **some students other than John came**, or John and some other students came.

7 Conclusion

I have defended the unexceptional hypothesis, and resolved problems which arise in accounting for the distribution puzzle: the deviance of *but* with *some*, *three*, and *most* is due to an interplay of NON-VACUITY and quantifier-specific felicity constraints; the deviance of *but* with plural definites is explained by effects of presupposition. I have also provided a preliminary discussion of exceptives formed with *other than*, which I argued are only optionally exhaustified.

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