Number-based effects on the goodness of English ‘the’

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Abstract. The ability to uniquely identify the intended referent in a given context is often considered a categorical factor licensing English ‘the.’ However, Reed (2016, 2020) compiles a wide range of non-unique uses of the definite article and suggests that uniqueness is just one among several contextual factors that plays a role. In particular, she suggests ‘the’ may be used even when the lexical content does not disambiguate in favor of a uniquely identifiable referent, as long as *sufficient* information about it has otherwise been provided in the context of the discourse. In this study, we measure how natural English speakers find occurrences of ‘the’ within contexts that vary in informational *sufficiency*, which we operationalize by way of two contextual factors: (i) the NUMBER of potential referents (relatively few vs. many), and (ii) HEARER-RELEVANCY (statement vs. request). Results suggest that our experimental participants were robustly sensitive to these contextual manipulations of *sufficiency* in rating the naturalness of ‘the,’ in line with Reed’s suggestion.

Keywords. semantics; definites; weak definites; referent uniqueness; sufficiency

1. Introduction. Standard theories of English ‘the’ assume it is the unambiguous, unique identifiability of the referent by both the speaker and hearer that licenses its use. Referents may become identifiable by virtue of *uniqueness* (e.g., Russell 2005; Kadmon 1990; Abbott 1999; Elbourne 2013; Roberts 2003), like in (1) where the definite description is used to refer to a globally unique entity, or by virtue of *familiarity* (e.g., Christophersen 1939; Heim 1982; Kamp 2002) or *salience* (e.g., Von Heusinger 2004) of the intended referent, as in the anaphoric example (2).

(1) The sun is bright today.

(2) A woman walked in. I had met the woman before.

In the past few decades, it has been increasingly acknowledged that ‘the’ also naturally occurs in some contexts where the intended referent is not identifiable (e.g., Carlson & Sussman 2005; Poesio 1994; Klein et al. 2013; Aguilar Guevara 2014; Schwarz 2014). These occurrences have been termed ‘weak definite’ uses of ‘the’ in the literature. In particular, weak definite ‘the’ is often discussed as being limited to two types of contexts: (i) possessive weak definites containing head nouns modified by ‘of’-PPs (3)-(4), and (ii) ‘the’-phrases where the lexical content of the accompanying noun phrase denotes a canonical role within a well-established situation or event type (5)-(6) – for instance, a referee at a game.

(3) John got these data from the student of a linguist. (ex. 4a in Poesio 1994)

(4) I usually had breakfast at the corner of a major intersection. (ex. 4c in Poesio 1994)

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(5) He got nasty, so I pushed the button for the flight attendant to come over.

(6) . . . appeared to draw a foul against the Bulls, but the referee blew a whistle. . .

To account for weak definites, one of two main types of strategies is generally invoked. One approach attempts to reconcile these seemingly exceptional uses under the broader theoretical umbrellas of *uniqueness* and *familiarity* also deemed relevant to explaining the more canonical (identifiable) occurrences of 'the.' For example, Aguilar Guevara (2014) provides a kinds-based analysis of weak definites where it is the uniqueness of the referenced well-established kind and not any individual entity that is relevant to the compositional semantics, even within episodic uses. Klein et al. (2013) suggest it is the familiarity of the activities described by the VP containing the definite article that is relevant in licensing the weak definites. Alternatively, a second approach is one wherein weak definite uses of 'the' are considered true exceptions to the norm, and analyzed independently of the regular uses, possibly as semantically incorporated nominals (e.g., Carlson 2006; Dayal 2015). What is common to both types of accounts is the expectation that the weak, non-unique uses of 'the' are fairly restricted in their distribution, as they necessarily require contexts denoting typical/well-established activities or 'of'-PPs.

However, Reed (2016, 2020) has recently observed that uses of 'the' where it refers to a non-identifiable referent are far more common than previously thought. In particular, she notices that they span beyond well-established, role-denoting contexts alone, and into "less discussed locative, bridged and iconic uses" as well as other idiosyncratic, on-the-spot, "good enough" uses. She collects naturally attested examples of such wide-ranging occurrences of 'the,' a sampling of which is shown below in (7)-(13). In all these cases, 'the' sounds completely natural discourse-initially, despite the lack of a readily identifiable referent or of a well-established, stereotypical context type. Note as well that (13) is not quite identical to the canonical role-based weak definites in (5)-(6) above, as the event in which the referenced non-identifiable bridesmaid participates (running off with the groom) is not a canonical event.

(7) Great candidate: he's got the chutzpah and the ready smile.

(8) He bought the house next door for \$3m, then the house on the other side.

(9) My folks live in the house just down the street from us.

(10) . . . his truck started driving violently and the tire blew out.

(11) The boy scribbled on the living room wall.

(12) (uttered as first reference to the woman, even when there was potentially more than one equally salient woman sitting behind the speaker at the show)
It's not a good show, as the woman sitting behind us complained to her friend.

(13) . . . there was a big gun fight in the church, the groom ran off with the bridesmaid. . .

When we begin to seriously consider the idea that non-identifiable uses of 'the' are truly more numerous and varied than has been represented in the literature, based on (7)-(13) and other similar cases discussed by Reed, the question arises: Is unique identifiability of the referent (whether by way of *uniqueness*, *familiarity* or *salience* of the referent) in fact the best contextual factor upon which to rest theoretical accounts of the definite article? Reed (2020) suggests an alternative to identifiability-based accounts, wherein it is a more general notion of *sufficiency* of information that is relevant to licensing 'the.' That is, 'the' may be used even when the lexical content does not disambiguate in favor of a uniquely identifiable referent, as long as sufficient information about it has otherwise been provided in the context of the discourse. What counts as sufficient in any given context is regarded as highly context-dependent, determined based on a combination of discourse-relevant considerations. In this sense, Reed's idea of *sufficiency* must be regarded as a relatively abstract, higher-order factor, whose realization is indirectly computed via the consideration of more concretely measurable features of the context.

The current study aims to empirically evaluate the viability of such a *sufficiency*-based hypothesis to 'the'-licensing as an alternative to more standard, unique identifiability-based ideas. Specifically, we formulate *sufficiency* as a consequence of two measurable contextual features, chosen based on a consideration of the features shared across (7)-(12) which exemplify diverse uses of 'the' where the referent is non-identifiable.[1] The first contextual factor we chose to manipulate corresponds to what we term 'hearer-relevancy,' which measures how critical it is for the hearer to know the identity of the entity being referenced in order to meet their discourse-goals.[2] For example, the hearer-relevancy of the intended referent in (12) is relatively low and, as such, uniquely identifying the referent may not be crucial to the success of the interaction, Compare this to a variant as in (14) where the hearer is being asked to further interact with the intended referent. In this case, sufficiency effectively amounts to unique identifiability, as such further interaction presumably necessitates the ability to identify the referent. In the current study, we construe hearer-relevancy as a binary-valued factor, depending on the illocutionary force of the utterance containing the definite article: regular assertions correspond to low hearer-relevancy, while requests denote high hearer-relevancy.

(14) (out-of-the-blue, when there is more than one equally salient woman sitting behind the interlocutor)
#Can you ask <u>the woman sitting behind us</u> her name?

The second contextual factor we manipulated pertains to the number of potential referents within any context. In each of (7)-(12), we can observe that while the intended referents of the 'the'-phrases aren't uniquely identifiable, the number of potential referents is nevertheless limited to just a few candidates. For instance, in (12), there are likely just a few women sitting behind the speaker and her companions at the show. A contrast in the acceptability of the 'the'-phrase may be observed when the number of potential referents is not similarly limited, as in (15).

(15) (out-of-the-blue) #It's not a good show, as <u>the woman</u> complained to her friend.

English speakers were asked to rate the naturalness of 'the' within contexts that vary systematically with respect to these two contextual factors. In Section 2, we describe the design of our

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[1] While we chose two contextual features to manipulate in our study, we do not mean to suggest that it is solely these features that contribute to the *sufficiency* of the description within a given context. Instead, they should be regarded as examples of potential contextual features that determine *sufficiency*, of which they may be many more. We revisit this point in Section 4.

[2] Our idea of hearer-relevancy is intended to be related to the idea of relevance á la Sperber & Wilson (1986), though the precise points of connection would need to be further clarified.

study, followed by a discussion of the results in Section 3, which reveal that participants were robustly sensitive to these contextual manipulations in rating the naturalness of 'the,' in line with Reed's suggestion. In Section 4, we discuss the implications of these results for theoretical accounts of the English definite article as well as a further planned follow-up study. Section 5 concludes.

2. Study.

2.1. PARTICIPANTS. 200 self-reported native English speaking adults who live in the US took the study through Prolific. They were asked how long they had lived in the US, with the average response being 40 years. They generally took about 6 minutes to complete the study and were compensated at the rate of $12 per hour.

2.2. STUDY DESIGN. Sixteen scenarios were constructed, each of which had four variations. At the end of each piece of background, a statement or request was presented that participants were asked to judge on a seven-point goodness scale. In two conditions, the final sentence was a statement, in which case exactly which referent was meant was not as relevant to the listener as it was in the two conditions in which the final sentence was a request. The number of possible referents varied between one, two-three, and 12-24. While both NUMBER and HEARER RELEVANCY were both factors, the study design was not fully crossed. The study conditions are shown in Table 1 with the names that are used for each in this study.

	statement	request
1		*sufficient*
2-3	*few*	*insufficient*
12-24	*many*	

Table 1. Acceptability study conditions

As a request in the context of a single possible referent fulfills the uniqueness requirement, we take this condition (*sufficient*) to be the baseline for an acceptable utterance. The minimally-different request in the context of several (2-3) possible referents, however, is taken to be baseline for an unacceptable utterance (*insufficient*), as the listener would not be able to fulfill the request without additional information.

The two conditions with statement utterances are minimally different. While neither requires the listener to know exactly which referent is meant, the *few* condition occurs in the context of two or three possible referents whereas the *many* condition occurs in the context of 12-24 possible referents.

Thus, the comparison of acceptability of the *few* and *many* conditions allows us to examine the question of the effect of NUMBER, i.e. whether having only a few possible referents allows the utterance to be acceptable, despite not having a unique referent. The comparison of the *few* and *insufficient* conditions allows us to examine the affect of HEARER RELEVANCY, i.e. whether the relevancy of listener identification of a referent likewise influences the acceptability of utterances in the context of two or three possible referents.

Each participant rated 16 utterances, each in the context of one of the 16 different scenarios. Four versions of the study were created, each with four scenarios/utterances from each of the four conditions.

2.3. STIMULI. An example of the minimally-different versions of a scenario and final utterance is given in Table 2.

condition	#potential referents	hearer relevancy	example scenario
sufficient	one	request	You're at your grandparents' farm. They have a hay field and one horse. You ask your cousin: "**Could you lead the horse to his stall?**"
few	2-3	statement	You're at your grandparents' farm. They have a hay field and three male horses. You say to your cousin: "**I'm going to lead the horse to his stall**"
many	12-24	statement	You're at your grandparents' farm. They have a hay field and 18 male horses. You say to your cousin: "**I'm going to lead the horse to his stall**"
insufficient	2-3	request	You're at your grandparents' farm. They have a hay field and three male horses. You ask your cousin: "**Could you lead the horse to his stall?**"

Table 2. Example scenario and its variations

The scenario was presented, with the utterance in question just below it, set off in red. A screenshot of how the participants saw each trial is shown in Figure 1, illustrated with the *few* condition.

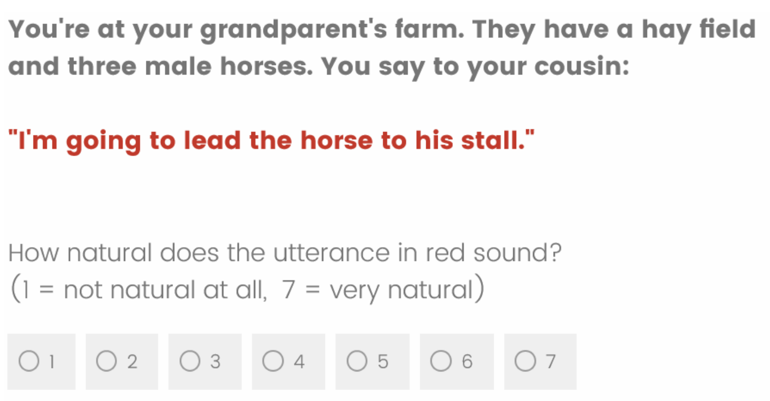

Figure 1. Example trial display

3. Results. The baseline for scenario inclusion was at least a 0.75 decrease in goodness rating between the *sufficient* and *insufficient* conditions. The six scenarios that fell short of this are considered flawed and thereby excluded as there was a very small goodness rating difference between the condition that should be good by all measures (unique referent) and the one that should be not good by all measures (non-unique referent where the specific referent is relevant to the listener). A graph of the *sufficient–insufficient* goodness rating difference (y-axis) by scenario (x-axis) is shown in Figure 2 (the six excluded scenarios are circled).

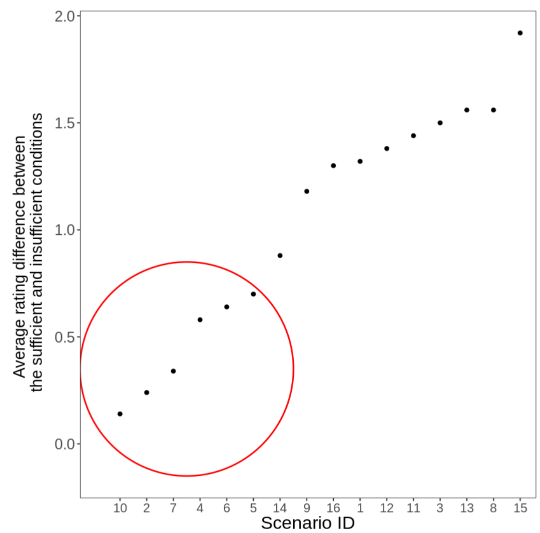

Figure 2. Goodness rating difference between *sufficient* and *insufficient* conditions by scenario

The analysis proceeded on the ten remaining scenarios. The graph in Figure 3 shows the average goodness rating for each of the four conditions. As expected, we see that the *sufficient* condition is rated the most highly.

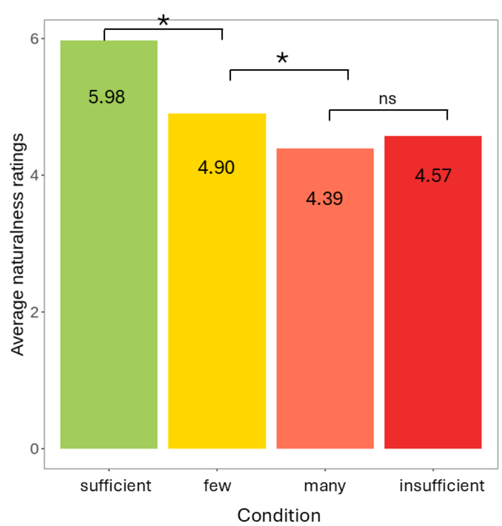

Figure 3. Goodness rating averages by condition (scale: 1-7)

An ordinal regression was run in R (2021) on GOODNESS_RATING, with factor CONDITION, and with random intercepts for SUBJECT within LIST and for SCENARIO [$\chi^2 = 264.936_{(3)}, p < 0.0001$].

Pairwise comparisons of the conditions show that while *few* was rated significantly lower than *sufficent* ($p < 0.0001$) it was rated significantly higher than either *many* ($p < 0.0001$) or *insufficient* ($p = 0.0118$). There was no difference between the two conditions with the lowest average ratings, *insufficent* and *many* ($p = 0.266$).

We see evidence for acceptability gradience, where an utterance in the context of a unique referent is rated the most acceptable, but where we also also see that an utterance in the context of a low, non-unique number of possible referents is rated more highly than one in the context of a higher number of possible referents, and is also rated more highly when the utterance is a statement rather than a request. This is evidence that both NUMBER (few vs. many) and HEARER RELEVANCY are factors in the acceptability of utterances with 'the.'

4. Discussion.

4.1. THEORETICAL CONSEQUENCES. The results of the current study cast significant doubt on the comprehensiveness of standards accounts for 'the,' all of which take uniquely identifiable uses as their starting point. A consideration from the outset of the numerous, varied natural occurrences of 'the' in contexts with non-identifiable referents suggests that alternative starting hypotheses may be better-suited to the data, such as the one based on a notion of *sufficiency* as suggested by Reed (2016, 2020). This type of alternative hypothesis finds support in our empirical findings. In particular, participants in our study exhibited a gradient acceptability pattern for the use of 'the' in various contexts, modulated by two systematically manipulated contextual factors: hearer relevancy and the number of potential referents. Such acceptability gradience is not predicted under existing theories, which take a more categorical view of what it would take to license the definite article. They also fail to anticipate any effect of contextual factors aside from the uniqueness of referent on the licensing of 'the,' especially in contexts where unique identifiability fails to hold.

Of the two contextual factors we investigated, the idea that hearer-relevancy matters to the interpretation of 'the'-phrases, is perhaps more easily reconciled with the existing literature (cf. Sperber & Wilson 1986), while the finding that acceptability of 'the' is affected by the number of potential referents is much more surprising in light of existing theories. Why might having fewer rather than relatively many potential referents affect the naturalness of the definite article? An explanation based on hearer expectations may be possible here, wherein a context containing a larger number of possible referents leads hearers to have an *a priori* higher expectation that more identifying lexical content is needed to meet the threshold of what counts as sufficient information within the context. When such identifying information is subsequently not provided, the resulting expectation violation leads to a more drastic drop in naturalness. In any case, the apparent peculiarity of the influence of number of potential referents notwithstanding, here we intend a more general take-away: that an account of 'the' based on a notion of *sufficiency* as determined by a combination of several lower-level contextual factors should be further developed as a more tenable alternative to unique identifiability-based theories.

We expect that a sufficiency-based account for 'the' would also be able to account for the more commonly discussed identifiability-based occurrences of 'the,' as well as the weak definite uses in well-established contexts that have been noted in the literature. For example, several contexts may indeed be such that sufficiency overlaps with unique identifiability – or in other words, the referent must be uniquely identifiable in order to meet the discourse- or hearer-goals. The requests that participants rated in our study may be taken as an instance of this type of context. The stereotypicality of the situation being described, as observed in the weak definites in (5)-(6), may further contribute towards *sufficiency* – for example, it is often sufficient to know that someone in the role of a flight attendant was involved in a canonical flight event, regardless of who the specific individual was.

Admittedly, this seems a little circular, the challenge here being ultimately one of developing a general notion of *sufficiency* across contexts that can be evaluated independently of whether the definite article can be naturally used in that context. Nonetheless, given the wide-ranging distribution of 'the' as well as its gradience acceptability across contexts, we believe that this challenge is well worth undertaking.

4.2. CONNECTION TO BARE NOUNS IN ARTICLE-LESS LANGUAGES. Once the expectation is relaxed that a uniquely identifiable referent is necessary to license 'the,' the distribution of the English definite article now seems somewhat more comparable to that of bare nominals in article-less languages, which are known to allow both identifiable (definite-like) and non-identifiable (existential or indefinite-like) uses in different types of contexts. Some existing accounts of bare nominals in fact take these items to be completely presuppositionless, and as such, their interpretation (whether as referring to discourse-old, known referents or to novel ones) is entirely context-dependent (e.g., Heim 2011). As such, an account for 'the' like the one advocated by Reed (2016, 2020) and supported by the results of our experimental study, wherein a combination of fine-grained contextual factors play a more serious role in determining its acceptability, bring 'the' more in line with its crosslinguistic bare nominal counterparts.

It is worth noting that drawing a theoretical parallel between bare nouns and at least some uses of 'the' is not unprecedented in the literature. For example, semantic incorporation-based analyses of weak definite 'the' are motivated by the observation that semantically incorporated bare nominals in languages such as Hindi exhibit the same range of distributional and interpretive properties as weak definites. The *sufficiency*-based proposal for the English definite article merely deepens this parallelism, by suggesting that 'the' does not only resemble bare nouns in so-called weak definite uses, but does so more generally.

This line of thinking further raises the possibility that the long assumed distinction of *definiteness* vs. *indefiniteness* is perhaps not a deep semantic universal, and that these should not be treated as crosslinguistically mutually exclusive categories (see also Srinivas 2021). Reed (2016) also notes several previously unnoticed (or at least under-discussed) overlap between English 'the' and 'a,' as in (16) and (17).

(16) <u>The/a fear of failure</u> keeps us from even trying.

(17) It's not a good show, as <u>the/a woman sitting behind us</u> complained to her friend.

An explicit acknowledgement of data such as these as well as the parallels between English 'the' and bare nouns suggests a novel angle from which to approach a semantic account of 'the' which uses the study of bare nouns as a starting point. We think this is an avenue that behooves further exploration.[3]

4.3. FOLLOW-UP STUDY. A follow-up study is planned, with two goals in mind. The first is to improve the scenarios so that all meet the threshold difference for inclusion. The second is to expand to six conditions in order to both potentially create stronger 'good' and 'not good' baselines but also to tease apart the relative contributions of NUMBER and HEARER-RELEVANCY.

[3] We should clarify that we certainly agree with the common consensus that there are in fact genuine differences between English 'the' on the one hand and bare nouns on the other, so how we ultimately account for each of them will necessarily have some divergences. The point that we wish to make in the text above is merely that there also seems to be a lot more overlap between the two than has been previously acknowledged.

The scenarios that performed better generally contained potential referents are were all distinguishable, but in which no one referent was more salient. Animate things are more automatically distinguishable, as opposed to, for example, pencils. We plan to keep some inanimate object scenarios, but will state they have, for examples, different colors. One of the challenges with utterances with definites is that listeners are good at accommodating and so are likely to assume that one of the possible referents is more salient than the others. To mitigate this we modified some scenarios to shift the scene such that the possible referents are removed from the visual field.

The followup study will also have a fully crossed design between the factors NUMBER (3 levels) and HEARER RELEVANCY (two levels). Adding in statements in the context of a unique referent and a request in the context of many (12-24) referents will create potentially even stronger 'good' and 'not good' baselines as results from the current study indicate that HEARER RELEVANCY matters, and so it seems plausible that the *statement-unique* condition will be rated most acceptable and the *request-many* condition will be rated the least acceptable.

5. Conclusion. This study reports experimental results showing that English speakers are more accepting of 'the' in a range of theoretically surprising contexts, even when a unique intended referent is not readily identifiable. We argue these results serve as proof-of-concept for a view of 'the' as espoused by Reed (2016, 2020), whereby the definite article does not directly denote unique identifiability. Instead, it is more fruitfully conceptualized as indicating the presence of sufficient information to enable the hearer to interpret it in a good-enough manner so as to not obstruct the ongoing discourse. This type of view also makes more interesting crosslinguistic connections, and presents a possible way to reconcile the semantics of the English definite article with bare nouns in article-less languages. The planned study will further test the viability of Reed's *sufficiency*-based proposal for 'the.'

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