

# Weak definite noun phrases: rich, but not strong, special, but not unique \*

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## 1 Introduction

The definite article paradigmatically appears in noun phrases (NPs) that select a uniquely identifiable referent from the known world or discourse. *The President of the United States of America* (at present) refers exclusively to George W. Bush; *the Peter W. Stanley Professor of Linguistics and Philosophy at Pomona College* is Jay Atlas; *the largest planet in our solar system* indicates Jupiter. Instances in which the referent of an expression is semantically unique in fact require the definite article. For example, the use of an indefinite article with a superlative (such as *a largest planet in our solar system*) is infelicitous. By contrast, indefinite articles canonically introduce new referents into the discourse. *A bald man with glasses* introduces an individual meeting that description into the common ground as a discourse entity. Unlike a typical definite NP, an indefinite NP does not presuppose the unique identifiability of its referent. While the distinction we are drawing here between definite and indefinite NPs ignores important nuances, it nevertheless captures the way NPs are generally divided: definite NPs refer to specific, unique discourse entities, and indefinite NPs introduce new discourse entities, or refer to entities that are not necessarily uniquely identifiable.

In this paper we focus on certain definite NPs that do not seem to behave like paradigmatic definite NPs. Carlson and Sussman (2005), inter alios, (e.g. Birner and Ward (1994); Barker (2005)) have noted that some definite NPs appear quite indefinite in nature, in that they (1) do not seem to presuppose unique identifiability and (2) do not appear to introduce individual entities into the discourse. These NPs, which we call *weak definites* following Poesio (1994), are the subject of the research we will present.

Consider the following sentence from Carlson and Sussman (2005):

(1) *Mary heard about the riot on the radio, and Bill did too.*

Intuition suggests that Mary and Bill must have heard about the same riot, but *not necessarily* by means of the same radio (or even the same radio station). *The radio* is a weak definite in this sentence: certainly, Mary and Bill *could* have heard the news on the same radio, but this is not

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necessary, contrary to the predictions of a canonical view of the presuppositions associated with the use of the definite article. That is, weak definites are systematically ambiguous between a “regular” reading in which there is a presupposition of a uniquely identifiable referent, and a “weak” reading, where there is not.

In the remainder of this paper we first discuss some of the characteristics of weak definite NPs, and then we present two experiments in support of the hypothesis that weak definites neither carry the same uniqueness presupposition as regular definite NPs, nor behave as indefinites do.<sup>1</sup>

## 2 Characteristics of Weak Definites

To a first approximation, weak definite readings are restricted to specific nouns in the lexicon<sup>2</sup>. For example, although *radio* allows a weak interpretation of a definite NP in (1), this is not necessarily true of synonyms or lexical associates. The following pairs of VP-ellipsis sentences illustrate the lexically restrictive nature of weak definites:

- (2) a. *Benedict listened to the radio, and Tracy did too.*  
b. *Benedict listened to the record, and Tracy did too.*<sup>3</sup>
- (3) a. *Jacob went to the bank today, and Carmen did too.*  
b. *Jacob went to the school today, and Carmen did too.*

The first sentence in each pair allows a weak interpretation, but the second does not.

In addition to lexical constraints, there are also environmental, or compositional, characteristics of weak definites. The following examples demonstrate governing and modification restrictions:

- (4) *Benedict kicked the radio, and Tracy did too.*
- (5) *Jacob went to the new bank today, and Carmen did too.*

Changing the identity of the immediate governing verb (as in (4)) or adding modification to the noun phrase containing the weak definite (as in (5)) excludes the weak interpretation. In these examples only the strong interpretation remains: the same radio and the same bank are unambiguously under discussion in the elided VPs.

In cases where the weak interpretation is available, the weak definite appears to share many qualities with indefinite NPs. This is clear in the following dialogue:

- (6) Nats: *Where did they take the hurricane victims?*  
Mike: *To the arena/ an arena/ the hospital.*  
Nats: *Which one?*  
Mike: *I don't know.*

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<sup>1</sup>While our experimental materials are in English, weak definites exist in various language types, as in the following examples: Dutch: *Hij zit in de gevangenis.* (He is in the jail.) Irish: *Bíonn a deartháir ar an teilifís.* (Her brother is on the television.) Thanks to Anne Pier Salverda and Nicholas Williams for these examples.

<sup>2</sup>Thanks to Gregory Ward for illuminating cases where special contexts potentially coerce weak interpretations with unexpected nouns, as with turkeys at Thanksgiving.

<sup>3</sup>There is a type/token distinction to be made here: while it seems entirely plausible for Tracy to have listened to a different copy of the *same* record, it is not consistent with the sentence for Tracy to have listened to a different type of record.

Mike’s answer, *I don’t know*, is infelicitous as a response to Nats’s question *Which one?* when the antecedent of *one* is a regular definite NP like *the arena*. In contrast, when the antecedent is an indefinite NP, *an arena*, or a weak definite NP, *the hospital*, the particular location need not be uniquely identifiable. Despite a superficial definiteness, Mike felicitously utters that the victims were taken to *the hospital*, even when he does not know which one; this uncertainty is infelicitous with a regular definite like *the arena*. In situations like these, weak definites behave much as indefinites do, and these truth-conditional similarities to indefinites, as well as the acceptability of VP anaphora with a non-unique referent, raise the possibility that weak definites are merely indefinites in disguise.

However, weak definites appear to convey meanings enriched beyond that of indefinites, as we see when comparing the preferred readings (7a) and (7b):

- (7) a. *Galya is in the hospital.* → *Galya is a patient getting medical treatment.*  
 b. *Galya is in a hospital.* → *Galya is inside a hospital building in some unknown capacity.*

The most colloquial weak definites show enrichment so salient that it becomes difficult to cancel the enriched interpretation, as demonstrated in the contrast between (8a) and (8b). In (8a), which is completely felicitous, the second clause is consistent with the enriched interpretation. In contrast, (8b), where the second clause strongly favors a regular definite reading, is distinctly odd:

- (8) a. *The plumber got sent to the slammer, because he didn’t pay his taxes.*  
 b. #*The plumber got sent to the slammer, because a pipe burst in cell block 4.*

Examples (8a) and (8b) suggest that rather than establishing a discourse entity the way indefinites typically do, weak definites evoke a conventional activity or event type. This leaves us faced with conflicting intuitions about the relationship between weak definites and indefinites. They appear to be truth-conditionally identical; however, the semantic enrichment or preference for an event reading rather than an individual reading of weak definites leads us to believe they are distinct.

### 3 Experiments

The goal of the present experiments is to investigate two hypotheses about weak definites that arise from the intuitions presented earlier. In Experiment 1, we investigate the claim that weak definites do not presuppose uniqueness. In Experiment 2, we aim to determine the functional boundaries between indefinite noun phrases and weak definite noun phrases. Here, we test the hypothesis that while weak definites and indefinites are similar because they do not refer to a unique discourse referent (thus felicitously allowing for a certain amount of uncertainty within the discourse, as illustrated in the example dialogue), they differ: weak definites fail to establish a new discourse referent at all, whereas indefinites do serve to establish a new discourse referent (albeit an indefinite, non-unique one). We assume a theory of discourse referents as presented in Discourse Representation Theory (e.g. Kamp and Reyle (1993)).

#### 3.1 Experiment 1

Weak definite NPs are identical in form to their regular definite counterparts, and because weak definite NPs are systematically ambiguous, the stronger coreferential interpretation is always felicitous. Moreover, the co-reference of a typical definite interpretation is visually trivial in a task



Figure 1: Experiment 1 Setup

involving the manipulation of objects<sup>4</sup>. Our study took the cognitive ease and truth-conditional ”safety” of the stronger interpretation into account in its design. Previous work by Brown-Schmidt and Tanenhaus (2008) has established that visual context encourages participants to treat differently demarcated regions as independent and cohesive discourse domains. Following this, in the current experiment we aimed to minimize the non-linguistic bias against the weak interpretation by painting each half of a magnetic board a distinct color to evoke two visual domains. Each domain contained a person, a distracter object, and a non-identical token of the critical noun.

Figure 1 shows a cartoon version of the setup. Pre-recorded scenarios were constructed so that each scenario could be used with a weak definite noun (e.g. *newspaper*) and a comparable noun that does not have a weak reading (e.g. *book*), as in (9):

- (9) *Rudy is a very literary guy. Today he wrote in his diary.  
 Then Rudy read the newspaper/book.  
 This afternoon, Patty read the newspaper/book too.*

Eighteen members of the University of Rochester community participated in the experiment for pay. Participants were told to act out the scenarios on the metal board using the magnets. We predicted that, when hearing weak definite nouns like *newspaper*, participants would tend to pair each agent with his or her own token, whereas for regular definites, like *book*, participants would be more likely to move the (old) token from the agent in one domain to the agent in the other. Because this latter interpretation requires the participant to move an item out of its color domain, we predicted that it would be a somewhat less preferred option than having agents act upon the items already in their own area. In this way we hope to create an environment with fewer non-linguistic biases against the weak definite interpretations. We expected that participants would only remove items from their established domain when there is no other option (e.g., for regular definite noun phrases, which refer to a unique token of the noun). Therefore, the dependent measure of Experiment 1 was the proportion of times a participant selected the new token of the critical noun during enactment.

Although we attempted to create an environment supportive of weak definites, we still had concerns that our task would under-represent the salience of the weak interpretations. In all cases,

<sup>4</sup>For more details about the challenges faced in obtaining weak definite interpretations in the lab, see Carlson et al. (2006).

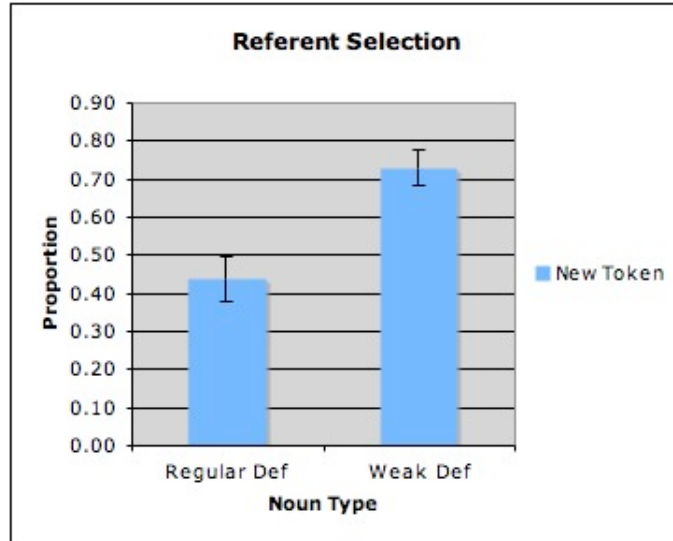


Figure 2: Experiment 1 Results

the strong interpretation was felicitous. Moreover, participants had recently executed the motor planning involved in selecting the first token of the critical noun. Since participants' eyes and hands had just been at the old token, which would always be a felicitous referent for the final sentence, selecting that token again would be very easy. These lingering concerns led us to eye-track all participants during the task. We reasoned that, while the actual enactment might under-represent the weak interpretation, eye-movements could potentially provide evidence that the new token was being considered as a possible referent for the final scenario instruction for weak but not regular NPs. It was because of this decision to eyetrack participants that we chose to repeat the full VP in our stimuli rather than use an elided form, giving us lexical material to which we could time-lock the eye movements. In fact, we need not have worried. In 73 percent of the trials with weak definite NPs, participants selected the new token as the final referent, compared with 44 percent of the trials with regular definite NPs. Statistical analyses revealed that this difference was significant ( $t=-3.3453$ ,  $p < .0001$ ). Results are shown in Figure 2 (all error bars are standard error bars).

Initially, it may seem surprising that the new token was selected for regular definites 44 percent of the time, even though regular definites conventionally refer to a uniquely identifiable discourse entity. However, recall that the experimental displays used color to implicitly establish different domains. In the post-experimental briefing of participants, we found that this manipulation had been enormously successful: despite the fact that several fillers explicitly required the movement of items across visual domains, many participants still reported that they felt hesitant to do so. Even though the overall temptation to treat each half of the metal board as an independent referential domain was greater than we anticipated, this effect was nevertheless substantially larger for weak definites, supporting the claim that weak definite NPs do not necessitate uniqueness of reference the way that conventional definite NPs do. Rather than selecting one unique individual entity to use throughout enactment (e.g. a particular one of the two newspaper magnets), participants preferred to replicate the event type (e.g. doing newspaper-reading with whichever newspaper was present in the agent's domain).<sup>5</sup>

<sup>5</sup>Because of the strength of our behavioral measure, the eye-movement data are not critical to our argument.

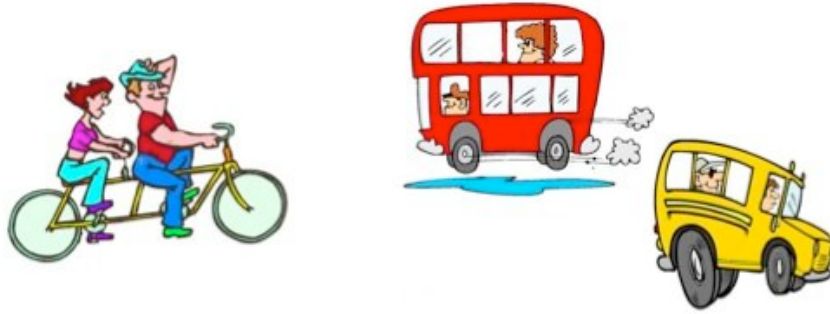


Figure 3: Experiment 2, One Token and Two Token

### 3.2 Experiment 2

The results of Experiment 1 indicate that weak definites do not presuppose the uniqueness of their referent. This raises the possibility that weak definites are indefinites masquerading as definites, and that they therefore serve to establish new discourse referents rather than to refer to old ones. Experiment 2 tests this claim in a scene verification task that assesses the acceptability of sentence/picture pairs<sup>6</sup>. Sentences such as (10) and (11) below contain either a weak or regular noun paired with either the definite or indefinite article. The conjoined-NP form of the sentences was chosen in order to emphasize the simultaneity of the described activities, so that participants would not be confused by seeing both individuals depicted in the same picture. Pictures crucially show either one or two tokens of the critical noun (e.g. *bike* or *bus*). Examples are shown in Fig. 3.

(10) *Dean and Anne rode a/the bike.*

(11) *Jerome and Sandy rode a/the bus.*

Scenes and sentences were presented simultaneously on a computer monitor. Thirty-three participants were instructed to rate the appropriateness of the written descriptions for each picture on a seven-point scale, with seven being the most appropriate. Two participants were excluded for reversing the scale, as evidenced in their filler ratings. If the critical NP prefers to establish a discourse entity, two-referent scenes should be rated as less appropriate (compared to one-referent scenes), since the number of entities in the discourse will not match the number of referents in the scene. If, however, the NP does not serve to establish a discourse entity, this numerical mismatch of referents will not exist, and participants will accept two- as well as one-referent scenes.

As expected, when only one token of the critical noun was pictured, all descriptions were rated as being highly appropriate (average of 6 or higher). The difference in ratings between one token and two token conditions is significant, as shown in Table 1.

Thus we focused our analysis on the trials containing pictures with two depicted tokens of the noun. For these items, the weak definite NPs (*rode the bus*) had the highest average acceptability

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However, first-pass analysis shows a pattern consistent with the behavioral data; when we measure the proportion of eye-fixations during the region including the repetition of the noun and the word immediately following, when people are looking at the old token of the noun they are more likely to have heard a regular definite, and when they are looking at the new token they are more likely to have heard a weak definite.

<sup>6</sup>Comparing weak definites to indefinites using the methodology from Experiment 1 proved to be too difficult given the very subtle nature of the phonetic difference between the two unstressed articles in our recordings

	F-value	p	
Noun Type	0.8478	0.357	
Article	1.0271	0.311	
Number of Pictures	47.1137	1.42e <sup>-11</sup>	***
Noun:Article	3.0096	0.083	.
Noun:Pictures	13.92	0.0002	***
Article:Pictures	1.708	0.1916	
Noun:Article:Pictures	2.688	0.1014	

Table 1: 3-way ANOVA for Experiment 2

rating. Weak indefinites (*rode a bus*) were somewhat worse, and close behind were regular indefinites (*rode a bike*). The regular definites (*rode the bike*) were much less acceptable. Mean ratings for two-referent scenes are shown in Table 2.

	Definite	Indefinite
Regular	3.676	4.242
Weak	4.828	4.717

Table 2: Mean Ratings for Two-Referent Scenes

An Analysis of Variance for the two-referent conditions showed a significant interaction (see Table 3): the weak/regular noun-type distinction matters more when the NP is definite than indefinite. In other words, nouns allowing a weak definite reading are generally more acceptable with two-referent scenes than nouns that do not have a weak interpretation, but this difference is greater in definite than indefinite NPs. Regular definites are less acceptable with these scenes than regular indefinites are; however, the reverse pattern is true for weak nouns, where definites are actually better (albeit not significantly) than indefinites for describing two-referent scenes.

	F-value	p	
Noun Type	6.4755	0.01135	*
Article	0.056	0.8127	
Noun:Article	4.249	0.0399	*

Table 3: 2-way ANOVA for 2-referent conditions

Curiously, weak indefinites are more acceptable with two referents than regular indefinites are. We speculate that this marginal difference could be due to the lexical aspect of weak definites: even when paired with an indefinite article, these nouns, in the right context, might be preferentially interpreted as evoking an event rather than an individual. That is, in the sentence “Jerome and Sandy rode a bus”, a bus may evoke the activity of *bus-riding*, rather than an individual discourse entity *bus*. Additionally, a planned t-test between the weak definites and the regular indefinites shows these conditions to be significantly different ( $t=-2.249$ ,  $p\text{-value}=0.025$ ), giving support to the claim that weak definites are not regular indefinites in disguise and might not prompt the establishment of discourse entities to the same extent.

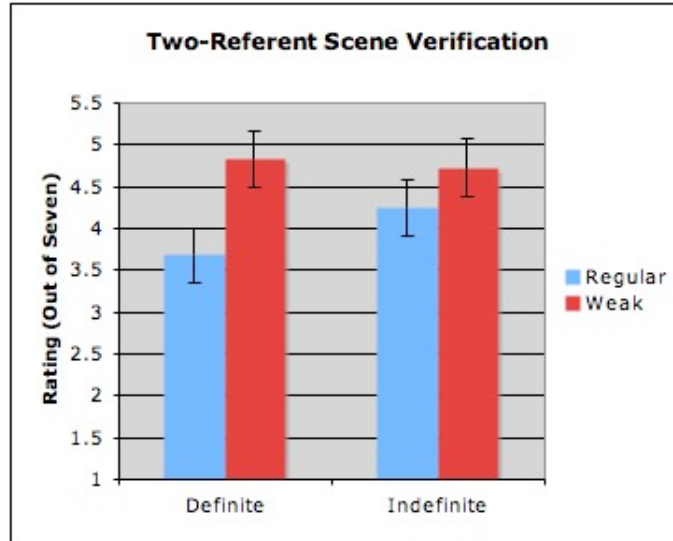


Figure 4: Experiment 2 Results

## 4 Conclusion

In sum, Experiment 1 demonstrates that weak definites do not presuppose uniqueness of reference the way regular definites do. Experiment 2 further demonstrates that comprehenders do not interpret weak definites as introducing discourse entities to the same degree as regular indefinites do. Instead, in both tasks weak definites seem to evoke the event or activity being described, rather than an individual discourse referent corresponding to the noun.

This latter observation suggests similarities between weak definites and incorporated nominal structures (e.g. Baker (1988)). That is, *baby-sitting* refers to an activity and does not include reference to a baby, even indefinitely, in the same way that *riding the bus* suggests an event rather than making any reference to one specific vehicle. This notion of semantic incorporation is widely discussed in the literature on incorporated structures (e.g. Farkas and de Swart (2004); Chung and Ladusaw (2004); van Geenhoven (1998)). The hypothesis we would like to pursue is that the structures in English and other languages with weak definites are a type of incorporation structure, at least in the semantically relevant sense. It is well known that many languages with morphological incorporation exhibit some of the crucial features that also characterize weak definites, and a natural extension of the experimental work exemplified here would be to examine incorporation-like structures in a wider variety of languages.

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