Gradual Uniqueness Effect: A Pragmatic Explanation

The uniqueness effects in definite noun phrases have been the subject of much debate (Heim 1982, Kadmon 1990, Lyons 1999, Szabó 2000, Roberts 2003). Some claim uniqueness is part of the semantics of the definite article, while others derive it pragmatically. Both sides assume that the uniqueness condition is categorical, and so the only thing that matters is whether the number of equally salient candidates is one or more. In this paper I present two cases showing **a gradual effect** of the cardinality of the group of candidates on the choice of the article. Then I propose a pragmatic analysis explaining the effect.

The first case is the use of the articles with body part terms. It has been noticed that non-unique body part terms are frequently used with the definite article. For example, when no previous information identifies the body part, the Spanish sentences (1) and (2) demonstrate a use of the definite article with a non-unique description, since a person usually has two hands and arms.

(1) Me duele la mano.
'My hand hurts.'

(2) Se rompió el brazo.
'He broke his arm' or 'She broke her arm'

I examined the distribution of articles in sentences like (1) and (2), with different body part terms, performing the search on the World Wide Web, using Google search engine. For sentences with 'duele' ('hurts'), percentage of the indefinite article use was 8% for the dual body part terms, 18% for 'dedo' ('finger'), and 61% for 'diente' ('tooth'). Comparable results were obtained for the possessive/indefinite alternation in English; in sentence of the like (3) the percentage of the indefinite article use was 3% for the dual body parts, 29% for 'finger' and 73% for 'tooth'. The conclusion is that the indefinite article is more frequent with higher cardinality body part terms than with the dual body parts. The effect was statistically significant for all the examined languages.

Another case is the use of articles with the word *co-author*. I checked the article used and the actual number of co-authors in a number of sentences with the word 'co-author' taken from book reviews on Amazon.com site. The results showed dependence between the two factors. When there are two co-authors, the indefinite article is rare (2 cases out of 17). The trend is the opposite for the cases with more than two co-authors: the indefinite article is more frequent in such cases (18 out of 23).

These data show that the effect of the cardinality of the set of candidates on the choice of the article is gradual. The uniqueness effect exists, but it is not categorical. The definite article is preferred when the candidate set contains two elements, and the usage of the indefinite article increases for larger sets. This cannot be explained if uniqueness is a semantic phenomenon accompanying every use of the definite article. However, a pragmatic explanation makes it possible to account for the data. According to Lyons (1999), the grammatical definiteness is a manifestation of the pragmatic notion of *identifiability*, the ability of the hearer to identify the intended referent. In the cases presented in this paper, a major factor influencing the identifiability is the cardinality of the candidates set, that is, the referent is less identifiable when the candidate set is larger. Lower identifiability leads to a higher percentage of the indefinite article use, and this is the reason why this percentage is higher when the candidate set is larger.

I propose **a formal pragmatic explanation** based on the analysis in Levinson (2000, p. 63). In this analysis, the definiteness and the indefiniteness markers form a scale <DEF, INDEF>. The definiteness marker is a sign that the identifiability of the referent is at an appropriate level. According to Grice's maxim of Quality, it should not be used when the identifiability is less than required. The indefiniteness marker does not signal identifiability. It is, however, accompanied by a Q-type implicature (Levinson 2000, p. 41) that the identifiability was not high enough for the definite marker. Such an implicature happens due to the maxim of Quantity.

The way these maxima influence the actual usage can be modeled within a theory of violable constraints of different ranks, allowing for degrees of violation. The predicted probability of a variant is

inversely proportional to a monotone function of the weighted sum of the ranks of the violated constraints, with degrees of violation as weights. The constraints are listed below:

- *DEF. This constraint represents the maxim of Quality. I propose that for the relational nouns the rank is *ReqP* (*required precision*), varying with the syntactic construction. The degree of violation is (*cardinality* - 1). This constraint penalizes for signaling more identifiability than present.
- *INDEF. This constraint represents the maxim of Quantity and the need to avoid unnecessary Q-type implicatures. For our purposes, the rank and the degree of violation can be constant and equal to 1.

The constraints are summarized in the following table:

Constraint	Rank	Degree of violation
*a	1 (constant)	1 (constant)
*the	*ReqP*	(*cardinality* - 1)

Table 1. The constraints

The competition table for a general case is shown in Table 2. The higher the cardinality of the possible referents set, the higher the total violation for the *def* variant, and the more probable is the *indef* variant. **This explains the gradual uniqueness effect** shown in the data above.

	*indef [rank: 1]	*def [rank: *ReqP*]	total
indef	*: degree = 1	-	1
def	-	*: degree = cardinality-1	*ReqP**(cardinality-1)

Table 2. Competition table for a general case

When the intended referent is unique, and full identifiability has been achieved, the *def* variant doesn't violate any constraint, and it is predicted to appear in all the cases:

	*indef [rank: 1]	*def [rank: *ReqP*]	total
indef	*	-	1
def	-	*: degree = 0	0

Table 3: Special case: unique identification.

In some syntactic constructions *ReqP* is very low, and the *def* variant is preferred, regardless of the cardinality of the possible referents set:

	*indef [rank: 1]	*def [rank: 0]	total
indef	*(degree:1, total:1)	-	1
def	-	*: degree = cardinality-1	0

Table 4: Special case: a syntactic construction with zero or very low *ReqP*.

The gradual uniqueness effect in the data presented in this paper cannot be explained by categorical uniqueness. The data support the pragmatic analysis presented in this paper. The presented analysis is not, however, inconsistent with the notion of the categorical uniqueness. If *ReqP* is very large, the *def* variant is predicted for *cardinality* = 1, and the *indef* variant is predicted for *cardinality* > 1. Therefore, categorical uniqueness is a special case of the analysis presented in this paper.

References

Grice, H. P. (1975). Logic and conversation. In: Cole & Morgan (eds), *Syntax and Semantics*, vol. III.
Heim, Irene (1982). *The Semantics of Definite and Indefinite Noun Phrases*. Ph.D. Dissertation.
Kadmon, Nirit (1990). Uniqueness. *Linguistics and Philosophy* 13, 273-234.
Levinson, Stephen C. (2000). *Presumptive Meanings*. MIT Press.
Lyons, Christopher (1999). *Definiteness*. Cambridge: Cambridge University Press.
Roberts, Craige (2003). Uniqueness in definite noun phrases. *Linguistics and Philosophy* 26.
Szabó, Zoltán (2000). Descriptions and Uniqueness. *Philosophical Studies* 101, 29-75.