

## Question tags and sentential negativity

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Received 6 March 2013; received in revised form 18 March 2014; accepted 19 March 2014

Available online 8 May 2014

### Abstract

This paper presents an experiment that is designed to quantify the negativity of sentences with different types of negative operators (n-words like *never* and downward entailing operators like *rarely*) in different syntactic positions (adverb, subject, and direct object). In the experiment, participants were provided with a minimal context, then asked to choose one tag-question out of two; one of questions had a positive tag and the other had a negative tag. Clearly positive sentences (i.e., sentences without any negative operators) and clearly negative sentences (i.e., sentences with overt sentential negation and no other relevant operators present) were used as controls. The relative frequency of positive and negative tags was then taken as a measure of the sentential negativity of each experimental item. Our main finding is that sentential negativity is a graded notion, sensitive to both semantic and syntactic factors. With respect to semantics, we find that n-words contribute more negativity than downward entailing operators, confirming the logical distinction between anti-additivity and downward entailment identified in the previous semantic literature on NPI licensing. With respect to syntactic position, we find that negative items in subject or adverbial position contribute more negativity than negative items in direct object position.

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**Keywords:** Sentential negativity; Tag questions; Negation; N-words

### 1. Introduction

The most straightforward way to mark sentential negativity is by means of an explicit, dedicated sentential negation operator. This is exemplified in (1-a), whose positive counterpart is given in (1-b).

- |     |    |                       |          |
|-----|----|-----------------------|----------|
| (1) | a. | Susan will not leave. | NEGATIVE |
|     | b. | Susan will leave.     | POSITIVE |

However, it has been well-known at least since Klima (1964) that there are many sentence types that do not contain an overt, dedicated sentential negation operator, but may still be called 'negative' in light of the fact that they exhibit striking similarities with clear-cut negative sentences like (1-a) and dissimilarities with clear-cut positive sentences like (1-b). Such sentence types are exemplified in (2):

- |     |    |                   |                  |
|-----|----|-------------------|------------------|
| (2) | a. | Susan never left. | (n-word adverb)  |
|     | b. | Nobody left.      | (n-word subject) |
|     | c. | Susan saw nobody. | (n-word object)  |

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- |    |                         |                              |
|----|-------------------------|------------------------------|
| d. | Susan rarely left.      | (downward entailing adverb)  |
| d. | Few students saw Susan. | (downward entailing subject) |
| f. | Susan saw few students. | (downward entailing object)  |

A large body of literature since Klima (1964) and Ladusaw (1979) has concentrated on the fact that the sentences in (2) pattern with (1-a) rather than (1-b) in licensing Negative Polarity Items (NPIs) like *any*. Upon closer examination, the category of NPIs has turned out to be quite complex, leading researchers to posit finer grained classifications of NPIs and of negative contexts – see van der Wouden (1994), Krifka (1995), Zwarts (1995), Zwarts (1998), Levinson (2008), Giannakidou (2011), Gajewski (2011) and Hoeksema (2012) among others.

For instance, a basic distinction has been made between *weak* and *strong* NPIs, where weak NPIs, like *any*, are licensed in any downward entailing environment, while strong NPIs, like *until* or *lift a finger*, are only licensed in environments that are not just downward entailing, but have the stronger property of being anti-additive.<sup>1</sup> Sentential negation and n-words like *never* and *nobody*, featuring in examples (2-a)–(2-c), are anti-additive, while items like *rarely* and *few*, featuring in examples (2-d)–(2-f) are downward entailing but not anti-additive.<sup>2</sup> This is reflected by the potential of these items to license weak and strong NPI, as exemplified in (3) and (4).

- (3) a. Nobody said anything. / Susan never said anything.  
       b. Nobody lifted a finger. / Susan never lifted a finger.
- (4) a. Few students said anything. / Susan rarely said anything.  
       b. \*Few students lifted a finger. / \*Susan rarely lifted a finger.

Based on such observations, it is tempting to think of n-words like *never* and *nobody* as being, in some sense, *more* negative than items like *rarely* and *few*. This paper addresses a number of issues that arise from this line of thought, listed in (5):

- (5) a. Is it possible to *quantify* the degree of negativity of the sentences in (2)?  
       b. Can some of the sentences in (2) be said to be more negative than others?  
       c. If so, which factors affect the degree of negativity?

In order to address these questions, we will identify a phenomenon that clearly distinguishes the two simple cases in (1), and then investigate to what extent the sentences in (2) pattern like (1-a) or like (1-b). The closer the behavior of a sentence is to the behavior of (1-a), the more ‘negative’ we will take that sentence to be.

The phenomenon that we will focus on in this paper is the formation of *tag questions*. Even though Klima (1964) already noted that tag questions based on positive sentences are markedly different from tag questions based on negative

<sup>1</sup> For a more detailed discussion of the licensing conditions for different subclasses of strong NPIs, see Krifka (1995) and Gajewski (2011) among others.

<sup>2</sup> A function  $F(\cdot)$  from sets to truth-values, i.e., of quantifier type  $\langle\langle e \rangle t \rangle t$ , is downward entailing iff  $X \subseteq Y$  implies that  $F(Y) \rightarrow F(X)$ . For example:

(i) *Few students are tall*  $\rightarrow$  *Few students are tall and blond*

because if less than half (or whatever other contextually salient proportion we choose) of the students are tall, then definitely less than half of the students are tall and blond.

Similarly:

(ii) *No students are tall*  $\rightarrow$  *No students are tall and blond*

A function  $F(\cdot)$  of quantifier type  $\langle\langle e \rangle t \rangle t$  is anti-additive iff  $F(X \cup Y) \leftrightarrow F(X) \wedge F(Y)$ . Anti-additivity is stronger than downward entailment. For example:

(iii) *No students are tall or blond*  $\leftrightarrow$  (*No students are tall*  $\wedge$  *No students are blond*)

In contrast, the same equivalence does not hold if we replace *no* by *few*:

(iv) *Few students are tall or blond*  $\leftrightarrow$  (*Few students are tall*  $\wedge$  *Few students are blond*)

Consider for example a set of 7 students, 2 of which are tall but brunette, 2 of which are blond but short, and the remaining 3 of which are brunette and short. In this situation, it is false to say that few students are tall or blond: 4 out of 7 students are either tall or blond. But it is true to say both that few students are tall (only 2 out of 7) and that few students are blonde (only 2 out of 7). So *no students* and *few students* are both downward entailing, but only the former is anti-additive.

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