Processing quantified noun phrases with numbers versus verbal quantifiers

Linda M. Moxey

University of Glasgow

Address for correspondence:

School of Psychology

58 Hillhead Street

University of Glasgow

G12 8QB

Scotland

Tel: +44 (0)141 330 6277

linda.moxey@glasgow.ac.uk

Abstract:

Statements containing quantity information are commonplace. While there is literature explaining the way in which quantities themselves are conveyed in numbers or words (e.g. many, probably), there is less on the effects of different types of quantity description on the processing of surrounding text. Given that quantity information is usually conveyed in order to alter our understanding of a situation, e.g. to convey information about a risk, our understanding of the rest of the quantified statement is clearly important. In this paper texts containing quantified statements expressed numerically versus verbally are compared in two text change experiments in order to assess how the entire quantified noun phrase is encoded in each case. On the basis of the results it is argued that numerical quantifiers place focus on the size of a subset, while verbal quantifiers are better integrated with nouns leading to more focus on the subset itself.

What difference does it make whether we choose to describe a quantity with a number, such as *80%*, or a verbal expression, such as *many*? There are good practical reasons for asking this question. Often we want to persuade people to adopt a particular behaviour or to refrain from a particular activity, but the facts we want to use persuasively are based on statistical relationships observed in large populations. Is it better to convey this statistical information using numbers or using words?

This question is also of theoretical interest to those who want to understand the processes involved in language understanding and decision making. While existing literature (briefly reviewed below) focuses on how numerical or verbal quantifiers themselves are interpreted and on consequences for decision making, it is argued here that messages containing numerical and verbal quantifiers are likely to be encoded differently. Here the aim is to use the text change paradigm to compare how numerically and verbally quantified noun phrases are encoded.

Early work on the mapping between numbers and words

The mapping between verbal quantifiers and the quantities they denote has been explored extensively (for a brief review see Sanford, Moxey & Paterson, 1994). From this it can be concluded that the relationship between verbal and numerical quantifiers is vague. Many contextual factors can influence the mapping between word and number, for example higher probability interpretations are given to expressions that describe severe outcomes, such as developing skin cancer, relative to the same expressions used to describe less severe outcomes, such as strep throat (Weber & Hilton, 1990). Expectations about a quantity constrain the interpretation given to a verbal quantifier. For example quantifiers such as *a lot* are interpreted as higher percentages when a large percentage is expected compared to the same expression used in a situation where a small percentage is expected (Moxey & Sanford, 1993). These findings have clear implications for those who wish to convey quantities in an understandable yet objective way, although these implications are often ignored. For example in the UK expert witnesses are encouraged to use one of a small set of verbal expressions to convey probability to a jury (Association of Forensic Science Providers, 2009) despite the fact that participants associate a wide range of values with each of these expressions (Mullen, Spence, Moxey & Jamieson, 2014). Similar problems are associated with the use of verbal expressions to convey the probability of side effects on medicine labels (Berry & Hochhauser, 2006).

The fact that the relationship between verbal quantifiers and quantities is vague and context dependent suggests that when we interpret these expressions we integrate quantifier meaning with situational knowledge. In practical terms this means that verbal quantifiers are not particularly useful for conveying a quantity about which people already have strong expectations or desires. For example, according to Cancer Research UK (http://www.cancerresearchuk.org/cancer-help/type/lung-cancer/about/lung-cancer-risks-and-causes) about 86% of lung cancer deaths can be attributed to smoking. We could describe this number with a variety of verbal quantifiers such as *nearly all* or *most*. Given the above conclusions, and the assumption that we already expect a large number of lung cancer sufferers to be smokers, the use of a large denoting verbal quantifier probably does not lead us to alter our beliefs. A numerical quantifier (86%) is more informative, and the quantity conveyed is probably higher than most people expect. It should be noted that the interpretation of a numerical quantifier has also been shown to depend on context, where interpretation is given on a non-numeric verbally labelled scale (Windschitl & Weber, 1999). Thus regardless of the direction of the mapping between verbal and numerical quantity expressions, it is mediated by contextual factors.

Other Inferences based on quantifier use

Moxey & Sanford (1993) have shown that verbal quantifiers can influence a reader or hearer's estimation of the amount previously expected by the producer of the quantifier. Thus for example, when a writer chooses *quite a few*, s/he is believed (prior to knowing the facts) to have expected a reliably lower quantity than if s/he chooses *many*; if s/he chooses *a few* the writer is believed to have expected a reliably smaller quantity than if s/he chooses *few* or *not many*. Thus readers often make an inference about the quantity expected or assumed by the producer of the quantifier.

In addition verbal quantifiers allow us to make inferences based on the relationship (or lack of relationship) between two sets. For example, *a few of the residents were angry with the government* will focus the reader squarely on the residents who are angry with the government, why they are angry, the consequence of their anger etc., rather than the fact that the number of residents is small. Interestingly, *few of the residents were angry* leads to a different pattern of focus (Moxey and Sanford, 1987) despite the fact that *few* and *a few* indicate very similar quantities (Moxey and Sanford, 1993). The shift in focus depends on the polarity of the quantifier. Positive quantifiers (like *a few*) lead to what we have called reference set focus (focus is on the subset mentioned in the quantified noun phrase, the angry people in the example); negative quantifiers (like *few*) tend to lead to focus on what we have called the complement set (a subset of the residents who are not angry). Verbal probability terms also have positive and negative polarity (Teigen & Brun, 1995; 2000; Juanchich, Teigen, & Villejoubert, 2010), compare for example *possible* versus *doubtful*. Evidence suggests that even low numerical probabilities are treated as positives when the number is not qualified by a verbal expression (Teigen & Brun, 1995). In one of their studies for example participants were presented with questions such as "Will you come to the meeting tomorrow?". Each statement was followed a probability expression, e.g. *it is unlikely* or *there is a 10% chance that I will come to the meeting*. The participants' task was to insert the word *Yes* or *No* prior to the probability expression in such a way that the response sounds like a reasonable answer to the question. While participants inserted "no" for negative probability expressions, they were more likely to insert "yes" for numerical probabilities, even when the number was 10%.

Thus it seems that unlike numerical quantifiers, when we encode a verbal quantifier we engage processes which allow us to integrate the quantified proposition with situational knowledge in order to draw appropriate inferences, as well as to update beliefs and infer the quantity denoted.

Basic Motivation for the current study

There has been a great deal of research on the processing of verbal quantifiers, and on the processing of numerical quantifiers, including more recent research using fMRI (e.g. Chochon, Cohen, van der Moortele & Dehaene, 1999; Olm, McMillan, Spotorno, Clark & Grossman (2014); Heim, McMillan, Clark, Baehr, Ternes, Olm, Min, & Grossman (2016). However there is little research directly comparing the way in which readers process numerical versus verbal quantifiers, and there appears to be none on the effects which numerical versus verbal quantifiers have on the processing of surrounding text.

The aim of this paper is to compare the effects of numbers versus words on encoding of the entire quantified noun phrase. The above research suggests that context is important for verbal quantifier interpretation, while numerical quantifiers will not rely to the same extent on the remainder of the quantified noun phrase.

The text change paradigm is used to test this prediction by assessing how deeply different parts of numerically and verbally quantified statements are processed as we read text. This paradigm involves presenting short pieces of text to participants who are asked to read each piece of text in the normal way, and to press the space bar as soon as they have finished reading. The same text is then presented a second time. In some trials the second presentation differs from the first and the participants' task is to report any changes. The method assumes that changes which are noticed reflect relatively accurate encoding of the original text compared to changes which go unnoticed. Large physical changes are more likely to be noticed than small differences e.g. if *the man* changes to *THE MAN* vs. *The man*, but so too are large semantic differences e.g. *The man with the hat* -> *dog* compared to small semantic differences e.g. *The man with the hat* -> *cap*. (Sanford, 2000). This method allows us to test depth of processing in the sense that aspects of text which are crucial to the reader's interpretation are likely to be processed well enough that they will be retained in memory, and therefore changes will be noticed. Aspects of the text which are not used in the reader's interpretation may be processed less well, and changes may be missed.

In the following experiments participants are presented with short pieces of text containing either numerical or verbal quantifiers. Let us assume that since numerical quantifiers contain digits these will "stick out" in the text, receiving more attention so that changes to numbers will be detected more often than changes to verbal quantifiers. However, the research described above implies that verbal quantifiers rely for their interpretation on the text surrounding them. When a noun phrase contains a verbal quantifier the noun should receive more attention during processing, and should be better integrated with the quantity information than the same noun when the phrase contains a numerical quantifier. Hence if the noun following a verbal quantifier is changed this should be more easily detected compared to the same noun change following a numerical quantifier. Numerical quantifiers were presented using digits rather than verbal equivalents (e.g. eighty percent) because this seems to be the normal way for numbers to be presented in health risk messages, for example.

Hypotheses

Each of the experiments reported here tests two basic hypotheses: (1) participants will detect more changes to numerical than to verbal quantifiers; and (2) changes to other parts of the quantified noun phrase will be detected more readily if the quantifier is verbal rather than numerical.

Given that the interpretation of a verbal quantifier is partially determined by prior expectations (Moxey & Sanford, 1993) we further expect that quantifiers which convey expected quantities will create less difficulty for the processor relative to unexpected quantifiers. Experiment 1 also tests this hypothesis.

Experiment 1

In Experiment 1 all experimental materials had a change either to the quantifier or to another part of the quantified noun phrase (usually the noun). All changes were slight in terms of both physical and semantic change (e.g. *82%* to *86%, many* to *a lot*, *population* to *people*). These experimental materials made up 60% of the materials. The remaining 40% had an identical structure, but these (control) materials did not change between presentations.

Design

This was a 2 (Quantifier type: Verbal versus Numerical) x 2 (Location of change: Quantifier versus Noun) x 2 (Consistency with expectation: Consistent versus Inconsistent) mixed design, with Quantifier type as a between participants factor, and Location and Consistency as within participants factors. It was decided that the same materials should be presented with each quantifier type (Numerical versus Verbal) so that a direct comparison could be made between noun change detections. We therefore used a different group of participants for each quantifier type. 24 of the experimental item pairs had changes to the quantifier, e.g. *82%* to *86%* or *many* to *a lot*; and 24 had changes to another part of the quantified noun phrase, e.g. *people* to *adults*. Half of the experimental items presented to each group contained quantities that were consistent with expectation (e.g. *Nearly all households in the UK own a TV*); the other half were inconsistent (e.g. *Nearly all bank notes in the UK have traces of cocaine on them*). There were 32 control items, half describing quantities consistent with expectations and half inconsistent, which did not change between presentations. Participants were not made aware of what proportion of the items would contain changes and the total number of item pairs presented to each participant was 80.

Materials

Quantified statements were all based on 'facts' which were taken from a variety of websites. Expectations were assessed in a pilot study in which each 'fact' was rated on a scale between 1 (totally expected) to 5 (totally unexpected); those in the consistent condition all had a mean rating of less than 2; materials used in the inconsistent condition all had a mean rating of more than 4 (see Appendix for example materials). In the main study these basic facts were embedded in a longer piece of text (such as (1) which is an example of an inconsistent fact) so that any text changes would be less obvious.

(1) The stereotypical Scottish person is depicted with red hair, bagpipes, and a kilt. It turns out that hardly any/12% of the natural redheads in the

world are from Scotland. An extensive worldwide study about redheads found this in 2012.

Participants

60 undergraduate students from the University of Glasgow took part, most of them for course credits, but some volunteered for no reward. All participants spoke English as their first language. 30 saw the numerically quantified materials; 30 saw the verbally quantified materials.

Procedure

Participants were instructed that they would be presented with pairs of short texts on the computer screen, and that they should read the first presentation of each passage in a normal way before pressing the space bar. The second presentation of each material was in a different font, with margins altered so that the words would not necessarily appear in the same location on the second presentation. The participant's task was to read the second presentation naturally, and again press the space bar. Participants were then instructed to report changes. The experimenter noted the participants' response before indicating to the participant that they should press the space bar to read the next passage. There were two files of materials – one containing verbal quantifiers and the other numerical quantifiers – and each began with 4 practice materials. Experimental materials and controls (with no changes) were presented in a pseudo-random order in each file.

Participant responses were recorded as correct when the participant identified the specific expression that had changed.

Results

Table 1 shows the percentage of correct detections, (means out of 12 and standard errors in brackets) for Experiment 1.

----Table 1 here-----

A 2 x 2x 2 ANOVA was carried out on the detection scores, with Quantifier type as a between participants factor, and Location of change and Consistency as within participant factors. There were main effects of all three factors, however these are qualified by multiple interactions, between Quantifier type and Location ($F(1,58) = 115.1$, $p<.001$), Consistency and Quantifier type ($F(1,58)=22.6$, $p=.001$), and Consistency and Location ($F(1,58)=4.4$, $p=.04$). In addition there was a 3 way interaction ($F(1,58)=10.1$, $p=.002$). From Fig. 1 it seems that for sentences containing numerical quantifiers Location and Consistency each constitute independent influences. Changes to the quantifier itself are noticed more than changes to the noun, and changes are more noticeable if the quantity described is inconsistent with expectation (irrespective of whether the change is to the quantifier or the noun). On the other hand, sentences containing verbal quantifiers are less straightforward.

Since our main hypothesis concerns a comparison between noun detections following Numerical versus Verbal quantifiers and the three-way interaction makes interpretation difficult, it was decided that a separate analysis should be carried out for each Location (Quantifier versus Noun), so that Consistency and Quantifier type could be directly compared.

Detecting changes to the quantity expression

A 2 (Quantifier type) x 2 (Consistency) ANOVA was carried out with quantifier type as a between participant factor and consistency as a within participant factor. There was a main effect of Quantifier type with changes to Numerical quantifiers being noticed significantly more often than changes to Verbal quantifiers ($F(1, 58) = 76.31$, $p < .001$). There was no main effect of Consistency, but there was a significant interaction between Quantifier type and Consistency ($F(1,58) = 33.19$, $p < .001$). Post hoc tests (Tukey HSD) revealed that changes in verbal quantifiers were more frequently detected when the quantity was consistent with expectation than when it was inconsistent ($p < .02$), while changes in numerical quantifiers were more frequently detected when the quantity was inconsistent than when it was consistent ($p < .001$).

Detecting changes to the noun

A 2 (Quantifier type) x 2 (Consistency) ANOVA was carried out as above for detections of noun changes. There were significant main effects for both Quantifier type and Consistency ($F(1, 58) = 38.9$, $p << .001$, and $F(1, 58) = 19.21$, $p << .001$ respectively). The interaction between the two factors was not significant. Post hoc tests show that there are more detections on noun changes where the quantity was inconsistent with expectation compared to consistent ($p < .02$ for both numerical and verbal quantifiers), and changes to the noun are more often detected after verbal compared to numerical quantifiers ($p<.001$ for both consistent and inconsistent quantities).

Discussion

In summary, while changes to the quantifier were easier to detect for numbers than words, changes to the noun were easier to detect when the noun was quantified with a word rather than a number. In addition changes to the noun were noticed more if the quantity is unexpected rather than expected, as were changes to numerical quantifiers. However changes to verbal quantifiers were more likely to be noticed if the quantity is expected rather than unexpected.

The finding that number changes are noticed more often than verbal quantifier changes is not surprising – numbers do seem to "stick out" in text, and it seems likely that they will receive more attention. It might also be argued that numerical quantifiers are more precise, and hence the truth value for numerically quantified statements will change more obviously following a text change (assuming the truth value does not change for many if not all of the verbal quantifier changes e.g. *many* to *most*). However, the results of this experiment are also consistent with our thesis that the process of interpreting a verbal quantifier interacts with the processing of other parts of the quantified statement. More attention is paid to the noun of a verbally quantified noun phrase (compared to that of a numerically quantified noun phrase).

The effect of consistency is quite clear when it comes to processing nouns. Nouns are processed more deeply when the quantity is unexpected compared to when the quantity is expected, regardless of whether the quantifier was numerical or verbal. Thus, when the size of a subset is unusual, more focus is placed on the subset.

Before concluding that noun information is more important for the interpretation of an accompanying verbal quantifier than to a numerical quantifier, there is another obvious factor that may explain the results of Experiment 1. The noun within a quantified noun phrase is obviously physically close to the quantifier. In fact the nouns that changed in Experiment 1 were often (46% of the time) within two words of the quantifier (e.g. 80% of people->individuals). Given the obvious attention paid to numerical quantifiers, it might be that readers are distracted by numerical quantifiers and so pay less attention to whatever word happens to follow them. The fact that the noun changes in Experiment 1 were more readily detected when the quantifier was verbal might simply be because readers were not distracted by a number in that case.

Experiment 2 was conducted in order to assess whether proximity of the noun to the quantifier explains the findings of Experiment 1. This experiment compares detections of noun changes when the noun is either near to the quantifier (as in Experiment 1) or one word later (following an adjective). If our hypothesis is correct, that verbal quantifiers are interpreted in tandem with the noun they accompany, then noun changes should be detected more readily following a verbal quantifier than following a numerical quantifier even if the noun is further away from the quantifier. If, on the other hand, the difference in noun detections in Experiment 1 occurs because of the proximity of the numerical quantifier to the noun, there should be a reduced effect of type of quantifier on noun detections in the adjective condition of Experiment 2. See Table 2 for average distances between quantifier and change in Experiments 1 and 2.

----Table 2 here----

In addition the materials used in Experiment 2 described situations including quantities about which participants are unlikely to hold strong prior expectations. Quantifiers are often used in such situations and so it is important to test our main hypothesis in contexts where expectations are not strong.

Experiment 2

In order to directly compare detection of noun changes in phrases with and without adjectives Experiment 2 used a 2(Numerical versus Verbal quantifier) x 2(change to Quantifier versus Noun) x 2 (Adjective Present vs. Absent) mixed design. Quantifier type was a between participant factor as in Experiment 1, and Location of change and Adjective were within participant factors. There was no manipulation of consistency in Experiment 2. Instead we used a new set of materials about which participants are unlikely to have any expectations. These were based on a pilot study in which participants both indicated their expectations about a quantity (a percentage) and their confidence in this estimate. 48 materials were selected which were associated with a wide range of expectations, and low confidence in the estimate given (indicating weak expectations). See Appendix for example materials.

Materials and design

The 48 materials were constructed with verbal quantifiers (set 1) and numerical quantifiers (set 2). The quantified statements were embedded in the middle of short texts similar to those used in Experiment 1 (see Appendix for some examples in each condition). In half of each set the quantifier was changed between presentations (e.g. *82%* to *86%* or *many* to *most*); in the other half the noun was changed (e.g. *staff* to *employees*). In half of each of the resulting subsets, an adjective was placed between the quantifier and the noun; in the other half there was no adjective. The 4 within participant conditions were arranged in a latin square design so that each material appeared in each condition over 4 files, and each participant would be exposed equally (12 times) to the 4 conditions. 32 similar texts with no changes between presentations were included with each set of 48 experimental materials, and presentation was in a pseudo-random order.

Participants

64 undergraduate Psychology students from the University of Glasgow served as participants – most of them for course credits. None of them had taken part in Experiment 1 or the pilot studies. 32 participants saw the numerically quantified materials; 32 saw the verbally quantified materials.

The procedure and the recording of change detections were identical to Experiment 1.

Results

Table 3 shows the mean percentage of correct detections (means out of 12 and standard errors in brackets) for Experiment 2.

----Table 3 here---

A 2 (Quantifier type) x 2 (Location of change) x 2 (Adjective) mixed ANOVA with Quantifier type as a between participant factor and Location and Adjective as within participant factors, reveals a main effect of Location, suggesting that changes to the quantifier are detected more frequently than changes to the noun ($F (1,62) = 50.2, p<.001$). However this is qualified by an interaction between Location and Quantifier type ($F(1,62)= 118.9, p<.001$). Post hoc (Tukey HSD) tests reveal that all p values are below p.05. In particular noun changes are more easily detected following verbal quantifiers than numerical ones regardless of the presence of an adjective ($p<.001$). Furthermore while in verbally quantified noun phrases changes to the noun are more easily detected than changes to the quantifier ($p<.05$), the reverse is true for numerically quantified noun phrases ($p<.001$). The presence or absence of an adjective had no significant effect on detections.

Discussion

The results of Experiment 2 suggest that changes to the noun are easier to detect if the quantifier is verbal compared to numerical, which suggests that nouns are better encoded in verbally quantified noun phrases compared to numerically quantified ones. Since the presence or absence of an adjective in Experiment 2 had no effect on the results we can conclude that the pattern of noun change detections in Experiment 1 was not a result of the distraction caused by numbers, but rather was caused by the greater depth of encoding for nouns in verbally quantified noun phrases.

The quantities described in Experiment 2 were quantities about which participants have little or no expectation, hence replicating the findings of Experiment 1 for this type of quantity.

General Discussion

There are several conclusions to be drawn from this research. First, that when numbers are presented in text, participants process them more deeply than the surrounding text. Since numbers differ from letters in a number of ways, this is not at all surprising though it does raise the question of whether this effect would disappear if the numerical expression was described with a word e.g. *twenty* rather than a digit, a question for further research. However, many messages that are intended to convey quantity information to the public, e.g. messages about potential health risks, contain digits to describe the risks. This may be desirable, given that people prefer to receive risk information in numerical form (Wallsten, Budescu, Zwick, and Kemp, 1993), and that listeners/readers are more likely to remember the quantity. However, it raises another important question. Does the presence of numerical information render the accompanying information less salient? If people process numbers at the expense of surrounding propositional content, then the overall message will fail.

The second conclusion is that in general quantities that are inconsistent with previously held expectations will be processed more deeply than quantities that are consistent with expectations. Noun changes in Experiment 1 were better detected when the quantified noun phrase was inconsistent with expectations, and numerical quantifier changes in Experiment 1 were better detected when they described an inconsistent quantity although verbal quantifier changes were better detected when they described a consistent quantity.   This suggests that if a writer wishes to describe a quantity which differs from the quantity expected, it may be better to use a number.

The final and probably the most important conclusion is that regardless of expectations verbal quantifiers are better integrated with nouns than are numerical quantifiers. In both of the experiments noun changes were detected more easily if the quantifier was a word rather than a number. It seems that while numbers are encoded well, relatively less attention is given to the noun which accompanies them compared to the same noun following a verbal quantifier. Verbal quantifiers may be processed less deeply, but the identity of the resulting subset is better encoded. It remains to be seen whether the better encoding of nouns in verbally quantified noun phrases leads to better memory for the subset, which could be assessed by a surprise recall task for example. Clearly this has implications for those hoping to change attitudes and behaviors with quantity information for example.

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Appendix

Example Materials with quantity expression changes (Experiment 1)

Consistent Statements

Before	**After**
Quite a lot/32% of scientific studies may be inaccurate or misleading.	***Quite a few/37%*** of scientific studies may be inaccurate or misleading.

Inconsistent Statements

Before	**After**
It turns out ***hardly any/12%*** of the natural redheads in the world are from Scotland.	It turns out ***almost none/15%*** of the natural redheads in the world are from Scotland.

Example Materials with noun changes (Experiment 1):

Consistent Statements:

Before	After
A nationwide school survey reveals that not many/11% of teenagers are left-handed globally.	A nationwide school survey reveals that not many/11% of adolescents are left-handed globally.

Inconsistent statements:

Before	After
Recent research showed that more than half/55.7% of drug users in the US reported getting their drugs from a relative.	Recent research showed that more than half/55.7% of drug addicts in the US reported getting their drugs from a relative.

Example Materials for Experiment 2:

Quantity expression changes in Quantifier + noun QNPs:

Before	After
When looking at postmen they found that many/65% of workers felt safe in their job.	When looking at postmen they found that most/75% of workers felt safe in their job.

Quantity expression changes in Quantifier + adjective + noun QNPs:

Before	After
He found that nearly all/ 81% of the regular customers were not able to access the WIFI.	He found that almost all/91% of the regular customers were not able to access the WIFI.

Noun changes in Quantifier + noun QNPs:

Before	After
He found that almost all/92% of the builders brought their own lunch with them.	He found that almost all/92% of the workers brought their own lunch with them.

Noun changes in Quantifier + adjective + noun QNPs:

Before	After
It was found that almost all/93% of the young trainees said that they are being taught well.	It was found that almost all/93% of the young apprentices said that they are being taught well.

Table 1: the mean percentage of correct detections for each of the experimental conditions in Experiment 1 (number out of 12 maximum plus standard error in brackets).

Quantifier Type	Position of change	Consistent with expectation	Inconsistent with expectation
Numerical	Quantity expression	67% (8.03, SE = .43)	80% (9.63, SE=.4)
Numerical	Noun	18% (2.17, SE=.35)	28% (3.33, SE=.36)
Verbal	Quantity expression	38% (4.57, SE=.43)	30% (3.57, SE=.4)
Verbal	Noun	40% (4.83, SE=.35)	50% (5.97, SE=.36)

Table 2: distances between the quantifier and the changed word in each of the conditions of each of the experiments, (along with the percentage of noun detections in the numerical quantifier condition). Conditions where changes were to the quantifier itself are excluded from the table.

Experiment/condition	Position of change (mean number of words from quantifier)	Percentage of changes detected
Experiment 1/consistent	1.3 words	18%
Experiment 1/inconsistent	2.1 words	28%
Experiment 2/no adjective	1.9 words	35%
Experiment 2/adjective	2.9 words	39%

Table 3 shows the mean number of correct detections (out of a maximum of 12) for each of the experimental conditions in Experiment 2 (standard error in brackets).

Quantifier Type	Position of change	With adjective before noun	No adjective
%	Quantity expression	74% (8.91, .35)	76% (9.09, .35)
%	Noun	39% (4.69, .33)	35% (4.18, .29)
Word	Quantity expression	49% 5.84 (.35)	53% (6.34, .35)
Word	Noun	59% 7.06 (.33)	59% (7.06, .29)