A VERBAL ILLUSION REEXAMINED

Vaitsa Giannouli[(A,B,C,D,E,F)]
School of Medicine, Aristotle University of Thessaloniki, Greece

SUMMARY

Background: The so-called depth charge sentences, as is the case with the famous sentence 'no head injury is too trivial to be ignored,' have been investigated in the past in a series of experiments. The aim of this study is to re-examine the verbal illusion that is associated with the understanding of some semantically and syntactically strange sentences, and to replicate Natsopoulos's (1985) classic research within the modern Greek native speaking population.

Material/ Methods: Three experiments were conducted in the Greek language with the use of variations of sentences that are claimed to create a misunderstanding in their interpretation. In total, one hundred and fifty-one native Greek speaking participants with no specific education in psycholinguistics were examined with a series of sentences.

Results: Results from the three current experiments revealed that there were some differences in the performance of the current Greek participants when compared to the performance of a similar sample of Greek native speakers thirty years ago regarding the different verbal variations of several anomalous sentences. Additionally, there were some differences in the English and Greek languages, but there was a strong verbal illusion regardless of the experimental manipulation in all of the reported studies.

Conclusions: Although there is a differentiation in performance for this verbal phenomenon across the participants' samples, future research should further investigate the cognitive and emotional factors that may contribute to the stable existence of this verbal illusion.

Key words: verbal illusion, psycholinguistics, Greek native speakers

INTRODUCTION

A verbal illusion means that two opposite interpretations of the same ambiguous sentence are possible (Cook & Stevenson, 2010). The sentence in the verbal illusion is semantically anomalous because the opposition between the adjective and the verb, as well as pragmatically anomalous because the relation between the noun and the verb expresses an injunction which is inconsistent with commonly held beliefs (Wason & Reich, 1979).

The sentence 'No head injury is too trivial to be ignored' is a verbal illusion in English (Wason & Reich, 1979). It is considered to be a verbal illusion, because this sentence is semantically anomalous since the relation between the adjective and the verb is the same as in the sentence: 'No sinner is too wicked to be condemned,' and at the same time it is pragmatically anomalous, because the relation between the noun and the verb expresses an injunction which is inconsistent with commonly held beliefs (Natsopoulos, 1985, p. 387). The terms pragmatic and non-pragmatic are used to refer to two different types of consistency and inconsistency respectively holding between the noun and the verb on the one hand, and between the adjective and the verb of the sentence on the other (Wason & Reich, 1979, p. 593-594). Each sentence carries pragmatic information and is consistent (externally), when it expresses a proposition coinciding with our beliefs-attitudes, as in the following example: 'No missile is too small to be banned.' Also, a sentence is consistent (internally), regardless of carrying pragmatic and non-pragmatic information, when the relationship between the adjective and the verb conforms to the rule the more X the less Y, as in 'No book is too interesting to be ignored.' In contrast, a sentence is inconsistent (internally) if the relationship between the adjective and the verb violates the rule the more X the less Y, as in the sentence 'No book is too trivial to be ignored.' Also, a sentence is inconsistent (externally) when the proposition it expresses runs counter to beliefs or attitudes held in common, as in the following sentence: 'No head injury is too serious to be ignored.' (Natsopoulos, 1985, p. 386).

So, this simple sentence, which seems perfectly acceptable at first sight, is considered to be logically incorrect and may lead to misinterpretation due to the existence of a negative verb, the relationship between the adjective and the verb (the more X, the less Y), and/or non-pragmatic information expressed in this sentence (Wason & Reich, 1979, p. 593). It is usually assumed that sentences such as this one are produced as the result of negation overload, but gain a coherent interpretation because of shallow processing, and because of the pragmatic factors which overrule semantics and syntax (Natsopoulos, 1985; Wason & Reich, 1979).

The aim of this study is to re-investigate in the Greek language the differentiating contribution of semantic anomaly (No book is too trivial to be ignored) on the one hand and semantic and pragmatic anomaly on the other (No head injury is too trivial to be overlooked) to the comprehension of sentences violating the rule -the more X the less Y-, and at the same time apply an independent measure of pragmatic factor on the structure conforming to the target sentence and its

corrected version in order to check up on the pragmatic factor as the main source of this verbal illusion (Natsopoulos, 1985).

MATERIAL AND METHODS – EXPERIMENT 1

Sixty participants from Greece (21 men, 39 women, Mage = 22.28, SDage = 2.15, Meducation = 14.83, SDeducation = .97), all native speakers, were tested on one strong pragmatic and one weak pragmatic sentence. The sentences were characterized as strong or weak pragmatic according to the ratings from Natsopoulos's study (1985, p. 388) which supported that sentences that were both pragmatically and semantically anomalous were rated higher on the scale than those that were only semantically anomalous. This difference was used as a cut-off point to label the former strong pragmatic and the latter weak pragmatic. The participants were asked to paraphrase eight sentences, as they are presented below and to report belief strength.

The preselected strong pragmatic sentences were as follows (Natsopoulos, 1985, p. 388):
1. No war is too trivial to be ignored.
2. No head injury is too unimportant to be overlooked.
3. No crime is too significant to be minimized.
4. No nuclear power is too wicked to be mistrusted.

The preselected weak pragmatic sentences were these (Natsopoulos, 1985, p. 388):
5. No verbal illusion is too unusual to pass unnoticed.
6. No news is too misleading to be turned down.
7. No speech is too disgraceful to be rejected.
8. No reading habit is too useless to be condemned.

As in Wason and Reich's study (1979) and Natsopoulos's (1985), each strong pragmatic sentence was paired with each weak pragmatic sentence, making a total of 16 pairs. Each pair was administered in both possible orders in two replications, making 64 presentations altogether and for that each presentation was assigned to a different participant (Natsopoulos, 1985, p. 389). All participants were given the following instructions: "On either side of the card presented to you there is a sentence. Each sentence expresses a proposition. You should paraphrase each sentence using your own words. Be careful. You should preserve the meaning of the sentence." (Natsopoulos, 1985, p. 389). In addition to that participants had to rate belief strength in relation to pragmatic factor by indicating the belief strength for each sentence in a scale from 0 (no beliefs held at all) to 6 (extreme beliefs held). The marking on the scale regarded what people think of this, and whether they hold beliefs or attitudes towards the topic expressed by the sentence under consideration. The sentences rated higher on belief strength are the strong pragmatic, and those rated lower are the weak pragmatic. Participation was voluntary and all the participants were examined individually.

RESULTS – EXPERIMENT 1

Results revealed that there are some differences between the means of belief strength in the current study and Natsopoulos's initial study (see Table 1).

MATERIAL AND METHODS – EXPERIMENT 2

Thirty native participants from Greece (10 men, 20 women, Mage = 25.90, SDage = 4.24, Meducation = 14.60, SDeducation = 1.94) participated in the second experiment.

The sentences tested were those used in Experiment 1, four strong pragmatic and four weak pragmatic sentences. Each of these was paraphrased into three sentences: One of the paraphrases mapped the correct syntax parsing but absurd meaning, violating the rule the more X the less Y. The second paraphrase preserved the rule the more X the less Y, having the negative verb complement replaced by a positive verb complement. This meaning is the one purported as a speech act by the original sentence, but in terms of correct syntax and semantics the paraphrase preserved the opposite sense. The third paraphrase normalized the absurd meaning of the original sentence by eliminating violation of the rule the more X the less Y. It introduced the more X the more Y relationship between adjective (negative) and verb complement (negative) (Natsopoulos, 1985, p. 391).

The following paraphrases are presented here as an example and in an identical manner as in Natsopoulos's experiment (1985, p. 391):

1. No war is too trivial to be ignored.

    la. The more trivial a war is, the less one should ignore it. [the rule: (the more X the less Y) is violated]

    lb. The more trivial a war is, the less one should take it into account. [the rule: (the more X the less Y) is preserved]

    lc. The more trivial a war is, the more one should ignore it. [(the more X the more Y relationship) is introduced]

Table 1. Syntax parsing and belief strength of sentences violating the rule 'the more X the less Y'

Sentence number	Weak pragmatic				Strong pragmatic			
	1	2	3	4	5	6	7	8
Correct parsing (frequencies) Greece-Current study	22	28	17	16	23	23	24	38
Incorrect parsing (frequencies) Greece-Current study	38	32	43	44	37	37	36	22
Means and SDs of belief strength Greece-Natsopoulos (1985)	1.88	2.88	2.25	2.00	4.06	3.38	3.56	3.56
Greece-Current study	4.40 (1.40)	4.13 (1.46)	3.20 (1.72)	3.30 (1.61)	3.00 (1.50)	3.36 (1.57)	3.36 (1.55)	3.41 (1.59)

According to the description, paraphrase 1a should be selected as the only correct version of strong pragmatic sentence 1. The order of the paraphrased sentences was randomized across participants, with the restriction that the correct parsing of syntax of each pair followed in a different order from the correct parsing in the one original sentence to the other.

The instructions given to the participants were again the same as in Natsopoulos's experiment: "On either side of the card presented to you there is a sentence marked by a number. This numbered sentence is paraphrased into three sentences numbered consecutively. First, you should carefully read the original sentence on the one side of the card. Second, you should select the paraphrase which you think correctly renders the syntax and the meaning of the original sentence. You should take into account that only one of the three paraphrases is correct. Be careful. When you finish with one of the two original sentences, do the same for the other. You have plenty of time in which to decide which paraphrase is the correct one." (Natsopoulos, 1985, pp. 391-392). Belief strength for all sentences was measured in the same way as in Experiment 1.

RESULTS – EXPERIMENT 2

Results revealed that are some difference between the means of belief strength in this study and Natsopoulos's initial study (see Table 2).

MATERIAL AND METHODS – EXPERIMENT 3

Sixty-one native Greek speakers (25 men, 36 women, Mage = 27.91, SDage = 8.07, Meducation = 14.29, SDeducation = 1.91) participated in Experiment 3, which replicates again Natsopoulos's experiment. The sentences tested in the experiment were those used in Wason and Reich's study translated into Greek. All sentences contained an adjective and a negative verb complement, and all conformed semantically to the rule the more X the less Y (internal consistency).

Table 2. Frequencies of correct and incorrect parsing of sentences conforming to the initial sentence in relation to belief strength

Sentence number	Weak pragmatic				Strong pragmatic			
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Correct parsing								
Greece-Natsopoulos (1985)	3	7	12	7	9	4	9	2
Greece-Current study	2	5	6	3	4	4	5	1
Incorrect parsing								
Greece-Natsopoulos (1985)	13	9	4	9	7	12	7	14
Greece-Current study	28	25	24	27	26	26	25	29
Means and SDs of belief strength								
Greece-Natsopoulos (1985)	1.88	2.88	2.25	2.00	4.06	3.38	3.56	3.56
Greece-Current study	3.66	3.63	4.20	3.96	3.20	3.23	2.76	3.00
	(1.47)	(1.79)	(1.42)	(1.92)	(1.51)	(1.56)	(1.85)	(1.80)

All participants were tested on one strong preselected pragmatic and one weak preselected pragmatic sentence. They were asked to paraphrase a number of sentences as in Natsopoulos's third experiment (1985, pp. 394-395).

The preselected strong pragmatic sentences were:
1. No missile is too small to be banned.
2. No government is too secure to be overthrown.
3. No dictatorship is too benevolent to be condemned.
4. No weather forecast is too plausible to be mistrusted.
   The preselected weak pragmatic sentences were as follows:
5. No error is too gross to be overlooked.
6. No message is too urgent to be ignored.
7. No film is too good to be missed.
8. No book is too interesting to be put down.

Each strong pragmatic sentence was paired with each weak pragmatic sentence, making a total of 16 pairs. Each pair was administered in both possible orders in two replications, making 64 representations (Natsopoulos, 1985, p. 395). Each presentation was assigned to a different participant. The instructions to the participants were again the same as in Natsopoulos's experiment: "On either side of the card presented to you there is a sentence. Each sentence expresses a proposition. You should paraphrase each sentence using your own words. Be careful. You should preserve the meaning of the sentence." (Natsopoulos, 1985, p. 395). Belief strength for all sentences was again measured in the same way as in Experiment 1.

RESULTS – EXPERIMENT 3

Results revealed that there are some cross-cultural differences for the English and the Greek languages (see Table 3) and the means of belief strength were different from Natsopoulos's initial study and the Greek replication study.

Table 3. Frequencies of correct parsing on the corrected version of the initial sentence in relation to belief strength

	Weak pragmatic				Strong pragmatic			
Sentence number	1	2	3	4	5	6	7	8
Correct parsing								
Wason & Reich (1979)	3	4	9	11	16	16	11	8
Greece-Natsopoulos (1985)	4	7	12	11	3	13	12	14
Greece-Current study	8	7	5	12	8	9	9	8
Incorrect parsing								
Wason & Reich (1979)	13	12	7	5	0	0	5	8
Greece-Natsopoulos (1985)	12	9	4	5	13	3	4	2
Greece-Current study	52	53	55	48	52	51	51	52
Means and SDs of belief strength								
Greece-Natsopoulos (1985)	2.00	2.19	2.13	1.50	3.00	3.44	3.81	2.69
Greece-Current study	2.61	3.18	3.15	4.23	3.38	3.16	3.28	3.03
	(1.83)	(2.11)	(1.81)	(1.64)	(1.84)	(1.94)	(1.89)	(1.91)

DISCUSSION

The above results reveal that there are some observed differences, in terms of reported frequencies, in the Greek and the English languages in the understanding that native speakers demonstrate for a verbal illusion as examined with the above three experiments. In general, there were some differences between the strong and the preselected weak pragmatic sentences correct and incorrect parsing and at the same time, differences were found in the belief strength that Greek participants reported in the current study and in Natsopoulos's study (1985). Future research should try to replicate the same experiments for this verbal illusion in more languages and in larger samples (Kizach, Christensen, & Weed, 2016).

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Address for correspondence:
Vaitsa Giannouli
School of Medicine
Aristotle University of Thessaloniki,
 University Campus
Thessaloniki, 54006 Greece
giannouliv@hotmail.com