

To Be or Not to Be, Isn't that a Question?

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1. Introduction

Seemingly, the notion of a question is a simple and uniform one. Most speakers can recognize a question when they hear one, and most orthographies find it sufficient to use a single symbol to indicate questions. Yet the linguistic and philosophical literature on questions is rich in analyses and controversies, and there exist a large number of subtypes of questions, both as regards form and function.

The two major types in most taxonomies of questions are *polar questions*, also referred to as yes-no questions or nexus-questions, and *x-questions*, also called wh-questions or questions of identity. A third type is the *alternative question*, whose characteristic feature is that it provides two or more alternatives from which one should be selected. In (1) we give one example of each kind:

- (1) a. *Is today Monday?* (Polar question)
- b. *What day is it today?* (X-question)
- c. *Is today Monday or Tuesday?* (Alternative question)

While these examples also illustrate typical question constructions, it is clear that there is more than one way to express questions of a similar function, and, conversely, the same type of structure can be used with varied functional impact. For instance, all of the following can be interpreted as x-questions, in the appropriate context:

- (2) a. *What time will she arrive?* (*wh*-clause)
- b. *She will arrive at what time?* (in situ *wh*-clause)
- c. *And she will arrive:?* (paused construction)
- d. *Her arrival time?* (noun phrase)

A recent attempt to capture both the uniformity in kind, and the variation in use and forms of expression is (Ginzburg and Sag 2000). This work, henceforth referred to as G&S, provides a well-argued analysis

of the syntax and semantics of questions in English within a HPSG framework. In addition to the types already illustrated above, they include *multiple x-questions* as in (3a) and *question fragments* as in (3b). The latter type is handled within a fairly elaborate model of the way questions, and, more generally, other dialogue acts, function in context, to which we will return later.

- (3) a. *Who arrived when?*
 b. *Who?*

Alternative questions, however, are conspicuously absent from this work. We suspect that this may be due in part to a lack of a well-developed model of coordination in HPSG, but the absence is noteworthy nevertheless. This paper will provide some observations on alternative questions and other types of questions that are not so well covered in G&S' work, notably deliberative questions. This will lead us to suggest some changes to the model.

In the next section I give a condensed overview of some central aspects of the G&S model. It should be stressed that this is not a review of the entire work, but meant as background information for a discussion of the mentioned question types.¹ In section 3 I discuss alternative questions and polar questions, and section 4 considers deliberative questions. Section 5, finally, offers my conclusions.

2. The G&S Model

2.1. Questions as propositional abstracts

The central idea as regards the semantic analysis of questions in the G&S model is that questions are propositional abstracts. Polar questions, simple x-questions² and multiple x-questions are all claimed to share internal structure in terms of a proposition that they are constructed out of, and a set of parameters. The difference lies in the make-up of the set of parameters: a multiple wh-question has more than one parameter, a simple wh-question has exactly one, and a polar question has an empty set of parameters. Using Typed Feature Structures (TFS), G&S provides the analysis in Figure 1 for the question *Who left?* and the analysis shown in Figure 2 for *Did Bo leave?*.

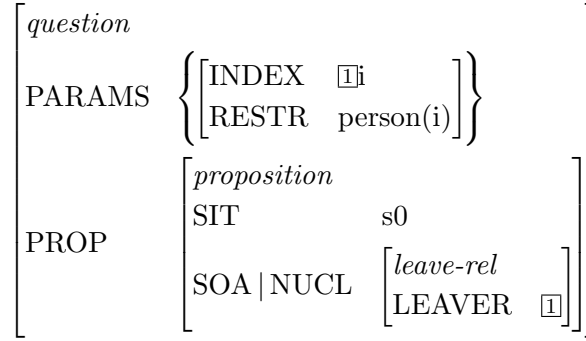


Figure 1: Analysis of the sentence *Who left?*

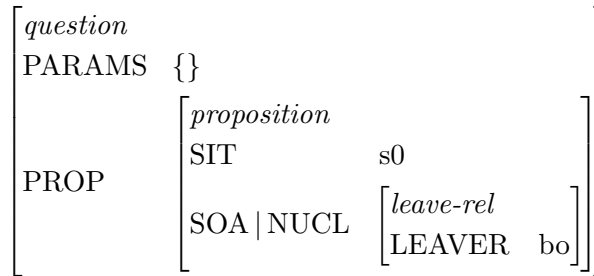


Figure 2: Analysis of the sentence *Did Bo leave?*

Thus, the model provides a unified account of questions as semantic objects. In addition, G&S show how syntactic and semantic properties of different types of questions follow from general assumptions about English phrase types and expressions such as wh-words and negative particles. As grammar is not in focus in this paper, I leave this part of the model aside.

2.2. Questions in dialogue

It has become increasingly popular in recent years to model dialogue in terms of changes of information states (Traum et al. 1999; Larsson 2002). Each dialogue participant maintains an information state, divided into a private part and a shared part. Every new contribution to the dialogue results in updates of the information states, and, conversely, new contributions are phrased according to what the speaker's

information state considers as shared information. A short exchange between two participants are assumed to develop along the following lines:

- A wants to communicate C1 to B
- A says U1 to communicate C1
- A updates her information state with C1 and U1
- B perceives and grounds U1 understanding C1'
- B updates her information state with C1' and U1
- B wants to communicate C2 to A
- B says U2 to communicate C2
- ...

There is in general no guarantee that B will interpret A's utterance in the way intended by A. This is why we distinguish C1 and C1' in the stages above. However, for the simple cases we will discuss, we will assume no conflicts of interpretation.

Following (Ginzburg 1996) the information state contains at least the following information: A set of shared facts, called FACTS, a set of questions that are currently under discussion, called QUD, and a record of the content of the latest contribution, called LATEST-MOVE. Later works have developed more elaborate information states, but the QUD has enjoyed a fairly stable existence. An important aspect of the QUD is that it is partially ordered in terms of conversational precedence, with one question possibly being the highest ordered in terms of this relation. As is common we will refer to this question as the MAX-QUD. This question is of special importance, since this is the contextual item that is assumed to licence and provide information relevant to the interpretation of short answers such as *Bo* or *Yes*.

2.3. Accommodation

In the case of simple question-answer exchanges, the relation between the question uttered and the MAX-QUD is straight-forward in normal circumstances. Once the question is grounded by the addressee, its content can be integrated as the MAX-QUD. In some developments of the model, assertions being made also give rise to a new MAX-QUD, viz. the question of whether they are true or not (Ginzburg and

Cooper 2004). If the addressee accepts this, the proposition asserted will then be recategorized as belonging to the set of FACTS. Similarly, volunteered information, expressed as a word or a short phrase, can be accommodated by assuming that it relates to a question, that the participants expect to be raised in the course of the dialogue. (Larsson 2002)

Accommodation may be seen as part of the inferencing that a dialogue participant (or, in fact, reader of a text) needs to perform. In Larsson's words (Larsson 2002: 161): "Accommodation is one type of reasoning involved in understanding and integrating the effects of dialogue moves". Accommodation obviously has to be restricted somehow. Not any information can be accommodated. There are at least two restricting factors. One is relevance to the current dialogue, and the other is that the question inferred has a tight relationship with the information given. For example, as a question abstracting over a proposition at the place where the contributed information would fit.

3. Alternative questions

An alternative question is a question that contains two or more phrases that are coordinated by a disjunction and embedded in some other marker of question-hood, such as a polar interrogative, a question intonation or a question mark. Some examples are given below:

- (4) a. *Did Bo or Mo leave?*
 b. *Did Bo leave or stay?*
 c. *Today is Monday or Tuesday?*

Alternative questions admit two types of answers. On the one hand they may be answered by *yes* or *no* as an ordinary polar question, but normally a choice of one of the mentioned alternatives is what is required. For instance, the first question above may be answered with a short answer as in (5), i.e., in the same way as the wh-question *Who left*:

- (5) a. *Bo (did)*
 b. *No, but Jo (did)*

Since alternative questions admit of short answers, it could be asked whether the relation of a short answer to an alternative question is substantially different from its relation to an x-question. In my view, the difference is not very large; one would expect answers to an alternative question to be drawn from the expressed set of alternatives, but as illustrated in (5b), other short answers are also possible. Unlike alternative questions, however, x-questions do not license *yes* or *no* as part of the response.

It would be possible to introduce a special rule to account for the relation of short answers to alternative questions. However, a better option is that an alternative question adds an x-question to the QUD, and actually to the MAX-QUD. This would account for the possibility of short answers in the same way as it does for proper x-questions. Moreover, the relation of an alternative question to the corresponding x-question is tight enough to be treated as accommodation, by abstracting over the position in the sentence structure where the disjunction appears. Thus, an utterance of (4a) would cause the addressee to place the question *Who left?* on her information state.

We must note, though, as in (5b) that a rejection of the mentioned alternatives seems to require a *no* before other answers can be given. This suggests that the representation cannot be exactly the same as for an ordinary x-question.

The effect of accommodating the x-question as a QUD could be seen as similar to updating an information state from two explicit consecutive questions, as in (6). The first of these questions actually provide a context for the interpretation of the short expressions that follow. For this reason it will be called a framing question. We use the same term whether this question is the result of direct integration or accommodation.

- (6) a. *What day is it? Is it Monday or Tuesday?*
 b. *Who left? Bo or Mo?*

The expressed alternatives must also be part of the interpretation, however. I will refer to them as answers-of-interest and represent them with an attribute AOI. Given that we can identify an appropriate abstract, the contents of the alternatives can preferably be represented as further restrictions on the parameter of the abstract, as in Figure 3. This

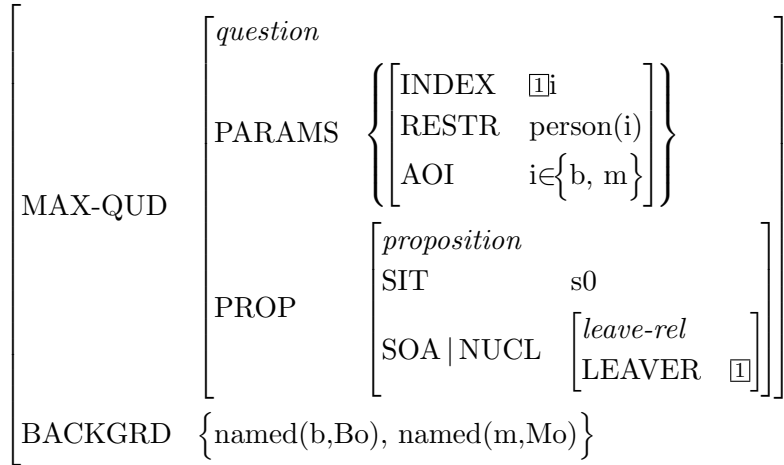


Figure 3: Representation of the MAX-QUD resulting from the question *Did Bo or Mo leave?*

makes the representation different from an ordinary x-question, which has an empty set of answers-of-interest.

The alternatives raised by an alternative question may be discussed at more or less length following the question. This is another motivation for making them explicit in the information state. Larsson (2002), makes this point in his model of negotiative dialogues, but we hold that alternative questions generally have this potential.

3.1. Polar alternative questions

A specific case of an alternative question is when the second conjunct is a negation:

- (7) a. *Did Bo leave or not?*
- b. *Are you coming or not?*

It has in fact been argued by many that a polar question should be treated as a kind of abbreviated alternative question of this kind. Bolinger (1978) argued forcefully against this view, however, and I see little reason to oppose him. Bolinger's major argument is that the addition of *or not* either adds insistence which otherwise would be absent,

or, in other contexts, impartiality or neutrality where a positive expectation is associated with the simple polar question. To see how this kind of alternative question would fit into the framework presented so far, we must first say something about polar questions.

3.2. Polar questions

According to G&S, polar questions differ from x-questions in that the set of parameters is the empty set. A drawback of this analysis is that it does not account for the fact that many polar interrogatives need more than just a *yes* or a *no* to be resolved. In many cases what is required is either a confirmation (i.e., a *yes* or some equivalent), or a correction, as in the following examples:

- (8) *A: Is today Monday?*
 B: No, (it's) Tuesday.
- (9) *A: Did Bo leave?*
 B: No, he just went out to have a smoke.

Thus, an utterance of a polar interrogative often implies a QUD with a non-empty set of parameters such as, for the examples above, *What day is it today?*, and *What did Bo do?*, what we called a framing question above. In addition, the polar question raises a possible answer "for discussion", in a way which is quite similar to the way an alternative question raises more than one answer candidate. This is quite parallel to the case of two consecutive questions as in (10).

- (10) a. *What day is it today? (Is it) Monday?*
 b. *Who left? Bo?*

The difference between (8) and (10) is that, in (8), the framing question is the result of accommodation, whereas in (10) it can be derived compositionally and integrated. Moreover, in (10), the second question already has a frame for its interpretation.

It may be argued against this proposal that polar questions will be ambiguous, i.e., that there are several different framing questions that can be derived from them. For instance, an utterance of (9) can be interpreted as relating to the framing question *Who left?* rather than

to *What did Bo do?* as implied by B's answer. This is true, but in spoken language intonation will often differentiate. Usually only one constituent receives pitch accent and this will be the constituent that gets abstracted from to create the QUD. In other cases, one component is markedly non-informative or underspecified. This is the case with alternative questions, but also with, for example, indefinites. Thus, (11) implies the question *What did you see at the Zoo?* rather than *Where did you see something exciting?*

(11) *Did you see something exciting at the Zoo?*

Apart from the linguistic indicators, making an utterance relevant is part of the interpretation process. Grounding at the constituent level has been shown to be important for the analysis of reprise clarifications in e.g. in (Ginzburg and Cooper 2004; Purver 2006), but surely grounding at the move level is equally important. Determining the framing question can be seen as a part of grounding the speaker's move which draws on knowledge of the discourse context in addition to knowledge of the grammar.

3.3. Zero abstraction

G&S defines their semantic universe as encompassing, among other things, propositional abstracts. In particular they make sure that the abstracts, representing questions, and the propositions that constitute their bodies, are formally different. The relation between an abstract and a proposition is mediated by so called place holders. The role of place holders is to identify components of the body of an abstract that can be the locus of abstracting. However, in the case of polar questions, the place-holder must not pick out a component, it must pick out something outside of the body.

A problem I can see with this construction is that the association between the formal object, the abstract, and the polar question that it represents, becomes arbitrary. The empty set of parameters seems not to add anything to the representation except the gain of treating all questions alike formally. But unlike the case of component place-holders, we do not get a parameter to place restrictions on as we do with x-questions.

Polar questions allow many types of answers that need the proposition part of the question as a contextual parameter, e.g., *yes*, *may be*, or *I think so*, all of which contract some answerhood relation with respect to the question.³ Many of these can be used also if the proposition is asserted. Thus, it is sufficient to relate the answer to the proposition to arrive at an interpretation, something which speaks in favour of the model. Some of the words and phrases that can accompany the proposition when it is asserted cannot be used with polar questions, however, or it least not with the same interpretation. For example:

(12) *A: Has Bo left?, B: **Already*

(13) *A: Bo has left, B: Already?*

(14) *A: Has Bo left?, B: ?I know.*

(15) *A: Bo has left, B: I know.*

With (12) one could assume that *Already* would imply an affirmative answer in the same way as other answers such as *regrettably* or *unfortunately* but for some reason it cannot. However, it can be used with the corresponding assertion, as in (13). The adverb *really* seems to behave in the same way.

In (15) B's utterance can be construed as 'I know that Bo has left'. This is not possible in (14), however, where *know* may pick up the question as in *I don't know*, meaning 'I don't know whether Bo has left'. or, with stress on the first word, as an answer to an accommodable question *Who knows whether Bo has left?*

The point is that if the occurrence of short utterances is to be explained with reference to some aspect of a MAX-QUD, we need some parameter that the utterance can pick up. If this parameter is not the proposition, or some part of the proposition, it must be somewhere else. Conversely, if a short utterance can pick up a proposition when it is asserted, but not when it is the base of a question, some value with which the utterance can clash seems to be required. But an empty set of parameters does not fulfil this requirement. It does not tell us in what way the proposition is 'open' nor does it provide a parameter to constrain.

3.4. Polar alternative questions revisited

In essence, we are suggesting that all questions contribute a question with a non-empty set of parameters to the information states. From the point of view of the G&S model, this is not necessarily controversial, since, after all, it has its focus on compositionally derived meanings.

However, polar questions vary with respect to the answers that they seek, that is with respect to the information needs of their speakers. There are polar questions that seem to indicate no interest in any other answers than a *yes* or a *no*. Polar alternative questions are of this kind. Simple polar questions such as *Will you be there?* if asked in connection with some future event like a conference or a party can also be of this kind. If the answer is no, there may be no interest in, and hence no discussion on, the potentially abstracted x-questions *Where will you be?* or *Who will be there?*. But when this interest is more likely, as with *Is today Monday?*, the related x-question *What day is it?* invites itself in a more direct manner. This is so because knowledge of the day is considered to be important for everybody (above a certain age) and it is known that there are, basically, seven alternatives values. Thus, whether a framing question is considered as part of an information state at all, depends largely on relevance factors, whereas the term of existence for it depends on the next and following moves.

The polar alternative questions using *or not* seem to be problematic for the G&S model, however. The option that the disjunction is part of the base proposition, or rather that the base is taken to be the disjunction of some proposition *p*, and its negation, does not give the right interpretation. A *yes*-answer would pick out the disjunction as a whole rather than the positive alternative. Thus, it seems necessary to “lift” the alternatives to something akin to our AOI attribute, with only the positive proposition as a body. If the set of parameters is required to be empty, this attribute need to be placed outside the parameters, at the top level as it were, but then it is not clear what is being constrained.

A variant of a polar alternative question is the following, where the answers that the speaker displays her interest in are again restricted to the the two alternatives accept/agree or reject/disagree.

(16) *Are you coming? Yes or no?*

Again, an attribute representing answers of interest seems appropriate. Whether the value of this attribute should be the words themselves or some expression of their content, say functions from propositions to propositions is a question that I leave open.

4. Deliberative questions

A deliberative question is a question about the future actions of some agent, perhaps most often the speaker herself or some group to which she belongs.

- (17) a. *What are we to do?*
 b. *How can this conflict be settled?*

A deliberative question can also be alternative, i.e., provide two or more specific alternative actions of interest. The most famous example of such a question is probably the one appearing in Hamlet's soliloqui, which is in fact a polar, alternative, deliberative question.

To be, or not to be: that is the question: whether 'tis nobler
 in the mind to suffer the slings and arrows of outrageous
 fortune, or to take arms against a sea of troubles, and by
 opposing end them? *Hamlet, Act 3, Scene 1*

The interest of deliberative questions in the context of the G&S model concerns the nature of their bodies. Is it a proposition or not? G&S makes three claims that bear on this issue. The first one is that all questions are related to propositions, they all have a part that semantically is a proposition. The second claim is that propositions (and questions) must be distinguished from a type of semantic object they call an outcome. An outcome is a message-type that is characteristically associated with imperative and subjunctive clauses, and with some infinitive VP's. Another feature of outcomes is that notions such as true and false do not apply to them, a feature which makes them distinct from propositions. Yet a third characteristic is that they are based on non-real state-of-affairs; in particular they are not anchored in time. In their universe, G&S model them with abstracts over the temporal parameter of a state-of-affairs.

It follows from this that questions cannot be constructed out of outcomes, a conclusion that is supported by the claim that questions in English cannot use imperative or subjunctive verb forms (p. 78). This seems to be true for imperatives and the subjunctive form *be*, but Nerbonne questions this claim in his review (Nerbonne 2005) with respect to the use of *were* with third-singular subjects.

Now, deliberative questions are usually formed with auxiliary verbs, having infinitival complements, as in the examples above. Deliberative questions with *to*-infinitives, such as *What to do?* or *Where to go for advice?* are also fairly common, so to make the semantic claim hold up, it must be assumed that in these sentences the infinitive actually expresses a proposition.

G&S (p. 216) analyses the sentence *I wonder whether to leave* as expressing a proposition in the *whether*-clause. This fits with their theory, but is not quite consistent with their analyses of the difference between infinitives that express outcomes and infinitives that express propositions. They give the following examples.⁴

- (18) a. Lee wants [to be happy] (outcome)
 b. They claimed [to know the answer to that question] (proposition)

Moreover, they say that outcomes go together with what they call mandatory predicates and they mention *demand*, *require*, *prefer*, and *instruct* as examples. These are verbs where one agent “mandates” something of another agent. But verbs such as *want* or *wish* that do not necessarily involve another agent but solely the wants or hopes of a single agent are implied by the example above to relate to outcomes.

What then with more salient examples of deliberation verbs such as *wonder* or *ponder*? Media provides several examples of sentences with these verbs followed by an infinitive as in (19).

- (19) a. *Under surveillance, three security police wonder whether to ask for autograph.*⁵
 b. *Opposition parties ponder whether to combine or go it alone in the fight for seats in parliament.*⁶

In the overall majority of these cases the *to*-infinitive VP expresses a future event with no fixed time argument, which is one of the features of

an outcome. Nor is its truth-value at stake. Sometimes the clause could be taken to denote a norm of some sort as if the question concerns the right or proper thing to do, in which case a propositional reading might be preferred. But often it is clear that the resolution of the question will happen through a decision in much the same way as mandatory events are resolved by decisions. The difference is that, in the case of deliberations the agent making the decision is the same as the agent that deliberates, whereas in the case of mandatory events the decision falls on somebody else to whom the mand is directed. We may add that often the problem of indecision that accompanies a deliberation has its source in a conflict of the agent's will with the demands of others. As another piece of evidence, we can note that it is often possible to follow on a deliberative question with a sentence carrying a mandatory predicate. For example, the second sentence may be followed by *What (outcome) would you prefer?* which indicates that it at least makes an outcome interpretation available from the VP's.

The G&S model assumes that the content of the *whether*-clause is unified with that of the complementizer itself and the content of its complement. If the VP denotes an outcome, whereas the clause denotes a question, two options are possible. Either we allow questions to be constructed out of outcomes in some circumstances, or we would have to find a way of coercing the embedded SOA into a proposition or an outcome depending on the item it is a complement to. The first alternative definitely seems the more appropriate. After all, propositions and outcomes are sub-types of the same superordinate message type, so it is not surprising that they could share properties. If so, what is required is that finer semantic distinctions are made to the outcomes, so that subjunctive and imperatives, on the one hand, denote different subtypes of outcomes than infinitive VP's.

5. Conclusions

To conclude, let us return to the question posed in the title. It is of course meant to be rhetorical, but a theory of questions should be able to tell us what makes those words a question, and how it should be properly represented. As for the first issue I believe we are forced to say that it is a question because Hamlet says so, and this is in itself a

support for having message types in the grammar, and in the lexicon.

As for the second issue, Hamlet's question is obviously alternative and polar. I have argued that the framework provided by G&S can not incorporate alternative questions without some augmentation. Alternative questions allow short answers in much the same way as x-questions. By assuming that alternative questions give rise to x-questions that frame the alternatives, and that such framing questions are maximal, we get an explanation for this fact. But the alternatives themselves must also be represented. When they relate to a component utterance parameter, it is natural to assume that they apply to the parameter's values and represent them accordingly. I have used an attribute AOI, answers-of-interest, for this purpose.

If we wish to handle polar alternative questions, such as Hamlet's or those that simply add *or not* to the end of a polar, interrogative clause, we face a problem: the G&S model has no explicit parameter representing the likelihood or truth value of a proposition. Instead, polar questions are represented with an empty set of parameters. Hence, when the explicit alternatives are *yes* and *no*, in whatever way expressed, there is no parameter which the alternatives can be related to. While there may be good reasons to keep truth-values out of the underlying semantic theory, the truth-false dimension (or, if one prefers, accept-reject dimension), could still be allowed as a topic, or question-under-discussion, in the modelling of information states.

Ordinary polar questions may also give rise to framing questions. They differ from alternative questions in that only one answer-of-interest is being proposed. Thus, all questions can be said to give rise to framing questions. While x-questions do so by straight-forward integration into information states, polar and alternative questions do so via accommodation of a suitable abstract. In addition, x-questions do not explicitly propose any answers-of-interest.

Hamlet's question is also deliberative. In general, all three basic types of questions may be deliberative, i.e., concerning future actions of an agent that are dependent on the agent's decisions. I have argued that deliberative questions relate to outcomes rather than to propositions, and, hence that the claim that questions can only relate to a body expressing a proposition, is too strong.

Notes

1. For proper reviews, see e.g. (Koenig 2004; Nerbonne 2005)
2. G&S use the term wh-question, but for consistency I stick to the term I myself prefer.
3. G&S recognize a scale of answerhood relations including exhaustive answers, resolving answers and answers that are merely about the question.
4. examples 84a and 84b, p. 52 in (Ginzburg and Sag 2000).
5. In other words ... David Bowie. London: Omnibus Press, 1986, cited from BNC, section AB5.
6. Part of a heading from an ArmeniaNow.com news article, Issue 3 (222), January 19, 2007.

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