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## **Truthfulness and Relevance in Telling The Time**

JEAN-BAPTISTE VAN DER HENST, LAURE CARLES AND DAN SPERBER

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**Abstract:** Someone asked ‘What time is it?’ when her watch reads 3:08 is likely to answer ‘It is 3:10.’ We argue that a fundamental factor that explains such rounding is a psychological disposition to give an answer that, while not necessarily strictly truthful or accurate, is an optimally relevant one (in the sense of relevance theory) i.e. an answer from which hearers can derive the consequences they care about with minimal effort. A rounded answer is easier to process and may carry the same consequences as one that is accurate to the minute. Hence rounding is often a way of optimising relevance. Three simple experiments give support and greater precision to the view that relevance is more important than strict truthfulness in verbal communication.

## 1. Introduction

Someone approached in the street and asked ‘What time is it?’ at a point when her watch reads (for instance) 3:08 is likely to answer ‘It is 3:10.’ Though not a lie, such rounding is a departure from strict truthfulness. The fact that it is extremely common seems to argue against the standard philosophical view that verbal communication is primarily governed by a rule, ‘maxim’ (Grice, 1975) or ‘convention’ (Lewis, 1983) of truthfulness from which it follows that speakers are expected to speak the truth. What explains rounding? What criterion are helpful speakers trying to satisfy in telling the time? Strict truthfulness, i.e. accuracy to the best of their knowledge? Truthfulness to some situationally acceptable degree? Or relevance? We want to argue that helpful speakers are always trying to achieve relevance to their hearer, and aim at accuracy and truthfulness in what they say only to the extent that these are necessary for relevance, which is by no means always the case.

The notion of relevance we use, and more generally the theoretical approach for which we provide experimental confirmation, is that of relevance theory. According to relevance theory, the greater the true consequences derivable from an utterance, and the smaller the effort required to derive them, the greater the relevance of the utterance for the hearer. A speaker, by the very fact of addressing a hearer, presents her utterance as being ‘optimally relevant’, that is, as being as relevant to the hearer as is compatible with her abilities and preferences, and, in any case, relevant enough to be worth the hearer’s processing effort. Most of relevance-theoretic pragmatics consists in showing in detail how this ‘Communicative Principle of Relevance’ governs verbal communication and grounds the interpretation of utterances in context.<sup>1</sup>

In asking a question, people indicate what information would be relevant to them. In answering a question, helpful speakers try to provide that information without causing the hearer any unmotivated processing effort. Genuine information is, of course, true information, and so helpful speakers aim at providing information that is true. However, this is not the same thing as *saying* what is true (in the strict sense of ‘saying’ where what a speaker is saying coincides – issues of reference aside – with the meaning of the sentence she utters). The information provided by an utterance must be sharply distinguished from the linguistically encoded meaning of the sentence uttered. The linguistic meaning decoded by the hearer serves as input to an inferential comprehension process (which is not to deny that decoding and inference overlap in time and interact in complex ways). The information

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<sup>1</sup> For a general presentation of relevance theory, see Sperber & Wilson 1995; for a detailed discussion of the respective roles of truthfulness and relevance, see Wilson & Sperber, submitted; for some experimental applications see Jorgensen, Miller & Sperber, 1984; Happé, 1993; Sperber, Cara & Girotto, 1995; Politzer, 1996; Gibbs & Moise, 1997; Hardman 1998; Nicolle & Clark 1999; Van der Henst, 1999; for an extensive bibliography, see <http://www.ua.es/dfing/rt.htm>.

provided by an utterance is to be found not so much in the linguistic input as in the output of this comprehension process, that is, in the recognition by the hearer of the speaker's meaning. Thus, it is possible, and indeed common, to satisfy a hearer's expectation of relevance while, strictly speaking, saying something one knows to be inaccurate or even plainly false, provided that the consequences that the hearer derives from his interpretation of the utterance are true and sufficiently important to be worth deriving. Truth and relevance are related in the following way: for an utterance to achieve relevance, it is required, not that what is said be true, but that the conclusions that the hearer is entitled to derive from his interpretation of the utterance be true (see Wilson and Sperber submitted for a detailed discussion).

Hyperboles such as 'I will be ready in a second,' or 'Everybody likes chocolate' illustrate the fact that the goal of achieving greater relevance often justifies the utterance of strictly false approximations. The fact that these utterances are strictly false does not make them misleading and thus does not compromise their relevance. Hearers are likely to ignore the false consequences derivable from these utterances (e.g. that the speaker will be ready in less than two seconds, or that there does not exist a single individual who dislikes chocolate). They are likely, rather, to derive from such utterances only true consequences which are salient in the context (e.g. that the speaker will be ready well in time, or that a gift of chocolate is appropriate even if you know nothing of the receiver's tastes). Moreover, processing these utterances may require less effort than would their strictly true counterparts ('I will be ready in an extremely short time,' 'Almost everybody likes chocolate'). Since the lower the effort, the greater the relevance, these hyperboles may well be more relevant than their strictly true counterparts.

What is the case with patently false hyperboles is even more obviously the case with utterances that are merely inaccurate: strictly true consequences are easily derived from

inaccurate utterances. Someone in the street who asks a stranger for the time and is told 'It is 3:10' when in fact, to the best of the speaker's knowledge, it is 3:08, is likely to derive only true consequences from this inaccurate answer: for instance, that he is in plenty of time for his 3:30 appointment. Most people's activities are commonly scheduled (if they are scheduled at all) to start on the hour or half hour, rarely at more specific times, hardly ever at times that, expressed in minutes, are not multiples of five. This is true, for instance, of almost all appointments, TV programs, or university courses. Only train schedules are regularly specific to the one-minute interval. In the absence of evidence to the contrary, then, it is likely that someone who asks a stranger in the street for the time, with no indication of his particular purpose in asking the question, will not be worse off with an answer rounded to a multiple of five. According to relevance theory, moreover, it is likely that such a person will actually be better off with a rounded answer, which requires less processing effort for the same cognitive benefit.

Even philosophers such as Grice or Lewis, who argue for some rule of truthfulness, do not claim that this rule should always be strictly adhered to. There may be degrees of truthfulness, and some situations may tolerate lower degrees. Being asked for the time by a stranger may be a case in point. Speakers may be helpful, but they are also understandably unwilling to make too much effort. You cannot, for instance, expect a stranger to tell you the time to the minute if it is easier for her to round it to the nearest multiple of five. Similarly, from a relevance theory point of view, speakers are not expected to produce a maximally relevant utterance, but only an optimally relevant one, where optimality is bounded by the abilities and preferences of the speaker. A speaker aiming at optimal relevance may prefer a formulation that requires less effort from herself and more from the hearer, provided that the resulting utterance is still relevant enough to be worth the hearer's attention. Even though

both the truthfulness and the relevance approaches recognise the imperfections of speakers, they yield different predictions about verbal behaviour in general – and testably different predictions about the particular case of the behaviour of strangers asked for the time. If truthfulness is the paramount criterion, rounding is at best a tolerable weakness. If relevance is the paramount criterion, rounding may be the best thing for speakers to do. Here is a case, then, where experimental data may bear on a standard issue in the philosophy of language.

The goal of the first two experiments we report was to ascertain people's tendency to round, and to show that two trivial factors, *laziness* and *prudence*, which are likely to contribute to this tendency, are not sufficient to explain it. The disposition to produce an optimally relevant answer is an important and independent explanatory factor. The subtlety of this disposition and the fact that it may involve attending to unexpressed concerns of the audience is demonstrated by the third experiment. All three experiments consisted in asking people for the time in public places. They were inspired, in their ecological simplicity, by the pioneering studies of Clark (1979), Clark and Schunk (1980), Francik and Clark (1985) and Gibbs (1986), who studied pragmatics aspects of questions asked of strangers.

## **2. Experiment One: Do Speakers Round in Order to Minimise Their Own Effort?**

In speaking, as in any other action, people are trying to minimise their own effort. For those with analogue watches, where only multiples of five minutes are marked (if anything), it is generally easier to round their answer. Thus, in rounding, such speakers may be minimising their own effort (i.e. be guided by laziness), rather than trying to minimise the effort of their audience (i.e. be guided by considerations of relevance to their audience). The frequency of rounding might just reflect the prevalence of analogue watches in the population. This can

easily be tested by comparing people who wear analogue and digital watches. For speakers with digital watches, just reading aloud the unrounded time shown on their watch involves fewer steps, and should be easier than silently reading this unrounded time, mentally rounding it, and telling the rounded time. If speakers rounded merely in order to minimise their own effort, then people with analogue watches would round and people with digital watches would not. If, as we claim, speakers are disposed to try and minimise their audience's effort, then some people with digital watches might make the effort of rounding for the sake of their audience. These contrasting predictions are easily testable.

Experiment 1 consisted in approaching people in a public place at random times and asking them (in French): 'Hello! Do you have the time please?' ('Bonjour! Est-ce que vous avez l'heure s'il vous plaît?'). We distinguished two groups: an *analogue* group of participants with analogue watches and a *digital* group of participants with digital watches. The experimenter took note of the type of watch worn, and the answer given. In order to test a population where digital and analogue watches were equally popular, the experiment took place at the entrance to the scientific University of Jussieu in Paris, and only male science students were approached (in France, where the experiments were performed, digital watches are not very popular and male science students presented a welcome exception in this respect). There were fifty-two people in the *analogue* group and forty in the *digital* group.

The experimenter (in this and in the other two experiments) did not know the exact time and did not look at the time indicated by the participant's watch. Only the response given was taken into consideration. We did not therefore estimate the rate of rounding by comparing the responses given to the time indicated by participants' watch; rather we compared the responses given to the theoretical distribution of times ending in a multiple of five minutes. This theoretical distribution is as follows. Out of a random sample of times expressed to the



minute, 20% should end in a multiple of five and 80% should not. Responses, in all experiments were sorted into two types:  $5x$  responses, in which the number of minutes is a multiple of five (these include all rounded answers and also answers given accurately when the watch happen to indicate a multiple of five), and  $not-5x$  responses, in which the number of minutes is not a multiple of five (these include only non-rounded answers).<sup>2</sup>

If there had been no rounded answers, then there should have been 20% of type  $5x$ , and 80% of type  $not-5x$  responses. However, this theoretical distribution was not found, or even approximated, in any of the three experiments we performed. We can estimate that 20% of the people gave a  $5-x$  response which was accurate to the minute since their watch indicated a multiple of five. Their accurate answers gives us no indication as to whether they would have rounded or not had their watch not indicated a multiple of 5. It is therefore the percentage of type  $5x$  responses over and above 20% that indicates the importance of rounding. More precisely, we can calculate the ‘percentage of rounders’ by means of the formula:

$$\text{Percentage of rounders} = (\text{percentage of } 5x \text{ responses} - 20)/80$$

According to this formula, when only 20% of the people give a  $5x$  response, the percentage of rounder is zero. When everybody gives a  $5x$  response, it is, of course, 100%.

[INSERT TABLE 1 AND FIGURE 1 ABOUT HERE]

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<sup>2</sup> In the first experiment, five hard-to-assign responses were ignored.

Table 1 presents the percentages of 5x and 5x responses in the three experiments, on the basis of which the percentage of rounders is calculated. Figure 1 presents the percentages of rounders in the three experiments. With analogue watches, the high percentage of rounders (97%) could be explained both by a tendency of speakers to minimise their own effort and by a tendency to minimise audience's effort. With digital watches, the percentage of rounders was significantly lower (57%) ( $\chi^2 = 16.43$ ,  $p < .0001$ ).<sup>3</sup> People round less with digital watches than with analogue watches, which is unsurprising given that it is easier for them not to round. What is surprising is that so many of them do round at all: the comparison of the frequencies of the 5x and non-5x responses with the theoretical distribution (see Table 1) shows a highly significant difference ( $\chi^2 = 49.8$ ,  $p < .0001$ ). This result falsifies the hypothesis that rounding is caused just by the concern of speakers to spare their own effort and that therefore people with digital watches should not round. It is well explained by the hypothesis that speakers spontaneously tend to minimise their audience's effort, even at the cost of an extra effort to themselves. Moreover, the fact that more than half of speakers with digital watches are disposed to make an extra effort in order to round their answer, thereby purposefully departing from accuracy, shows, contrary to standard philosophical views, that relevance is more important than strict truthfulness in ordinary verbal communication.

### 3. Experiment Two: Do Speakers Round in Order to Limit Their Commitment?

Some people may round not out of laziness but out of prudence. They may be unsure that their watch is accurate to the minute, and may limit their commitment by using a time-scale

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<sup>3</sup> In the three experiments, the chi-square was calculated on the basis of the frequencies of 5x and not-5x responses.

expressed in five-minute intervals. In other words, they may, in fact, be as strictly truthful as their knowledge allows. If this prudence factor, together with a common tendency to minimise one's own effort, were enough to explain why people round, then changing the context of the request should not affect the percentage of rounders. If, on the other hand, speakers are guided by considerations of relevance to the hearer, then framing the request so as to suggest that an answer which is accurate to the minute would be more relevant than a rounded one should lower the percentage of rounders. This prediction was tested in Experiment 2 where, in the *experimental* group, the experimenter indicated to participants that he was asking for the time in order to set his own watch correctly. He ostentatiously held a wristwatch in his hand and said: 'Hello! My watch is going wrong. Do you have the time please?'. In the *control* group, the experimenter just asked: 'Do you have the time please?' Ninety-one people, all with analogue watches, were asked for the time in the shopping centre of Euralille (Lille, France). The *experimental* group was composed of forty-five, and the *control* group of forty-six participants.<sup>4</sup>

Someone setting his or her watch right is likely to find an answer that is accurate to the minute more relevant than a rounded one. As predicted, there were fewer rounders in the experimental than in control group (see Figure 1,  $\chi^2 = 16.11$ ,  $p < .0001$ ). When a time that was accurate to the minute was clearly relevant to their audience, 51% of the people in the population tested were confident enough of their watch and helpful enough to give it. Still, 49% of people in the experimental condition did round (significantly above the theoretical level of 0%: ( $\chi^2 = 41$   $p < .0001$ ). They were, we assume, guided by laziness, prudence, or the two combined. These 49% of rounders in the experimental condition must be compared with the 94% of rounders in the control condition, where participants were merely asked for the

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<sup>4</sup> Five hard-to-assign responses were ignored.

time without indication that accuracy would contribute to relevance. The presence of these 45% extra rounders in the control condition is not explained by laziness and/or prudence alone. It is, at least in part, an effect of people's disposition to attend to what may be relevant to their hearer, and therefore to round or not round according to whether accuracy is likely to contribute negatively or positively to the relevance of their answers.

In Experiment 2, participants were given explicit evidence of the fact that a time that was accurate to the minute would be useful. The greater accuracy of their responses might be explained as a conscious and deliberate attempt to help the experimenter set his watch right, rather than by a more general spontaneous disposition to be optimally relevant to one's audience. Our third experiment was devised to elicit responses attuned to much subtler considerations of relevance, of a kind that can be taken into account only by speakers who attend to the unexpressed mental states of their audience.

### **3. Experiment Three: How Much do Speakers Attend to What is Relevant to Their Audience?**

The main variable of interest in Experiment 3 was not the question asked (since all the participants were asked exactly the same thing) but the interval between the time at which the question was asked and the time of an appointment that the experimenter indicated he or she had. Our prediction was that the shorter the interval between the time of the question and the time of the appointment, the more accuracy would be seen as potentially contributing to relevance, yielding more accurate answers. There are two related reasons for this prediction, one mathematical, the other practical. It can be assumed that the person who is asking for the time will use the answer to compute the interval of time left before the appointment. The

shorter this interval, the greater the proportional difference each minute makes to it. The greater this difference, the more likely it is to have practical consequences. Suppose you have an appointment at 3:30 p.m. and it is 3:08. Being told ‘It is 3:10’ is likely to be optimally relevant: the two-minute departure from the exact time is unlikely to have any consequences, and the rounded answer is easier to process. On the other hand, if the time is 3:28, accuracy is more likely to contribute to relevance than in the previous case. Being told the accurate ‘It is 3:28’ rather than the rounded ‘It is 3:30’ may make the difference between relaxing for another couple of minutes and beginning to worry.

In Experiment 3, a hundred-and-forty-two people with analogue watches, walking in the Luxembourg Gardens in Paris, were approached by the experimenter who said: ‘Hello! Do you have the time please? I have an appointment at  $t$ ’.<sup>5</sup> We distinguished two groups of participants: an *earlier* group of those who answered with a time between 30 and 16 minutes before the time of the appointment, and a *later* group of those who answered with a time between 14 minutes before the appointment and the time of appointment itself.<sup>6</sup> As shown in Figure 1, the percentage of rounders went down from 97% in the earlier group to 75% in the later group ( $\chi^2 = 6.64$ ,  $p = .01$ ). This effect is relatively small, but still, it is significant and calls for an explanation. We know from Experiment 2 that, when the need for an accurate answer is explicit, about half of people will provide it. What Experiment 3 suggests is that nearly half of such helpful people will go even further. Even when what may be relevant to

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<sup>5</sup> This was a double blind experiment: the two experimenters, one female, one male, were not told the purpose of the experiment or our predictions and were instructed to make their request in the same manner and tone throughout. They each worked in three intervals of half an hour starting on the hour or the half hour, e.g. from 2:00 to 2:30 p.m., and mentioned as the time  $t$  of their appointment the end of the interval, e.g. 2:30.

<sup>6</sup> We eliminated twenty-six people who gave as a response a time 15 minutes before the appointment, so as to have two groups who could each round to just three multiples of five (30, 25, and 20 minutes before the

their audience is not at all explicit, they will nevertheless try to infer it from indirect evidence, and will adjust the accuracy of their answer accordingly. In order to adjust their response in such a manner, these particularly helpful speakers must, in the few seconds it takes to answer a request for the time, make an extra inferential effort.

## 5. Conclusion

To determine what is relevant to someone, it is necessary to attend to his or her states of mind. There is an extensive psychological literature on ‘theory of mind’ or ‘mindreading’ abilities, exploring how humans are capable of attending to one another’s states of mind (e.g. Baron-Cohen, Tager-Flusberg & Cohen, 2000; Carruthers & Smith 1996; Davis & Stone, 1995).

There is also a rich literature on perspective taking in communication which has shown that speakers take into account the point of view of hearers in a way that facilitates comprehension (see Krauss & Fussell 1996 for a review). The present study shows that such a mindreading ability and attention to the point of view of the hearer is at work even in the simplest forms of everyday communication between strangers. Speakers tend to make the effort of inferring what information may be relevant, i.e. be both consequential and easy to process, for the hearer. In so doing, they go beyond facilitating comprehension, and attend to the interests that make comprehension desirable to the hearer in the first place. Helpful speakers aim at relevance in what they say. They spontaneously adjust the level of accuracy of their utterances – up or down as the context requires – so as to optimise relevance.

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appointment for the earlier group, 10, 5, and 0 minutes before the appointment for the later group). We also ignored seventeen hard-to-assign responses.

Our evidence thus confirms two claims. It confirms the general claim of Gricean and post-Gricean pragmatics that human communication involves the attribution of mental states by the interlocutors to one another. It confirms the more specific claim of relevance theory that human communication is guided by considerations of relevance involving two factors: effect and effort. Our evidence also casts doubts on the standard philosophical view that human communication is primarily governed by a rule of truthfulness in what is said.

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[4209 words, plus the figure and the table below]

***Table 1: Percentages of 5x and not-5x responses in the three experiments.***

		5x responses	not-5x responses
Theoretical distribution		20%	80%
Experiment 1	‘Analogue’ group (N=49)	98%	2 %
	‘Digital’ group (N=38)	65.8%	34.2%
Experiment 2	Control group (N=44)	95.5%	4.5%
	Experimental group (N=42)	59.5%	40.5%
Experiment 3	‘Earlier’ group (N=40)	97.5%	2.5%
	‘Later’ group (N=59)	79.7%	20.3%

*Figure 1: Percentage of rounders in the three experiments*

