

# USING A NEAR-STATISTICAL DEPENDENCY APPROACH IN TESTING NON-NATIVE SPEAKERS' ABILITY TO RECOVER ENGLISH CONVERSATIONAL IMPLICATURES

by

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This study describes an attempt to test non-native speakers' ability to recover English conversational implicatures. It also emphasizes the importance of pragmatic awareness to non-native speakers of English. In addition, the paper tries to answer two main questions: Is using a near-statistical dependency approach in testing the recovering of implicatures a valid tool? Are strategies of attaining relevance in Arabic similar to those used in English? Our answer to the first question is an affirmative yes while the answer to the second question is no. It seems that respondents who answered questions that are based on a particular cultural background fail to recover implicatures in the utterances that require a different cultural knowledge. This obviously means that the native logic they applied did not help them to recover proper implicatures. It also shows beyond doubt that teaching non-native students hidden pragmatic strategies can definitely help them in applying the right logic in recovering appropriate implicatures.

**Key words:** Implicature, Gricean, maxims, relevance, near-statistical dependence, contingency

## *1. Introduction*

The study described here attempts to investigate whether Gricean conversational maxims can be tested in a survey using a near-statistical dependency approach. The study was conducted at the Gulf University for Science and Technology, GUST, in Kuwait. It was observed that many Arab students face a considerable difficulty in expressing

themselves in English, while others found it very difficult to figure out what a particular exchange of language meant.

Understanding pragmatic breakdown in English communication is a very intricate task for Arab learners of English. Numerous studies have been conducted on foreign learners of English with a view to examine their ability to comprehend communicated meanings that cannot be implied based only on the wording of utterances. Such studies have shown that correlating foreign communicative competencies to those of native speakers of English could play a crucial role in improving TESOL (Teaching English to Speakers of Other Languages), curricula. (Bardovi-Harlig & Dörnyei, 1998; Bardovi-Harlig & Hartford, 1993; Churchill, 2000; DuFon, 2001; Ellis, 1992; Hill, 1997; Roever, 2001; Rose, 2000; Taguchi, 1999; Trosborg, 1995). There is a need for specialized studies that specifically concentrate upon foreign students' abilities to recover meanings that are intentionally implied for communicative purposes. Recovering such meanings is part of pragmatic competence, the ability to use language in a context to achieve communicative goals (Leech, 1983) – an ability that is unfortunately ignored in many EFL and ESL curricula. Such a pragmatic ability relies on communicative competence (Hymes, 1972) to recover contextual meanings (Grice, 1975; Levinson, 1983; Sperber & Wilson, 1995; Thomas, 1995).

Other studies on Gricean conversational maxims (Thomas, 1995; Kopytko, 1998:195-211) showed that speakers seldom observe the ideal practice of conversational maxims – in fact, observance of the conversational norm involves breaching most of the conversational maxims. According to Grice, implying meaning may not be a property of the utterance itself; as Ramsland observes, "Grice believes that such an objection has serious problems. He suggests that implication may not necessarily constitute part of the meaning of the expression" (Ramsland et al., 1987: 327). In teaching English as a foreign language, it is crucial to teach pragmatic principles whose non-observance may lead to failure in communication. Here,

Sperber and Wilson convincingly argue that relevance is an inherent property of human communication (Sperber & Wilson, 1995); therefore, there is no need for any regulative principles like the ones suggested by Grice, for politeness and for cooperative principles. When interlocutors communicate with each other, they rely not only upon a linguistic structure, but also upon contextual, situational, and paralinguistic factors to interpret what they hear. Interlocutors, therefore, try to relate what they hear to the indices that are already available in the context in order to achieve relevance.

## *2. Background*

In this study, we will show that foreign learners of English deliberately follow tacit principles to gloss meanings in English. We also want to show that using a near-statistical dependency approach in testing non-native speakers' ability in recovering English conversational implicatures is feasible. This particular statistical approach is suitable for testing the non-native speakers' ability to op for the best implicature in context.

Several earlier studies investigating conversational implicatures (Kasper, 1984; Koike, 1996; Taguchi, 2002; Takahashi & Roitblat, 1994; Ying, 1996, 2001) have shown the importance of conscious teaching of implicative strategies to learners of English. Bouton (1988) used a test of 33 short dialogues with non-native learners to compare their results with their native counterparts. Since non-native learners failed to achieve satisfactory results, Bouton assumed that there was an urgent need for creating a curriculum based on pragmatic competence. The same non-native students successfully followed an intensive English course where pragmatic comprehension occupied a primary position in the curriculum. Bouton concluded that cultural background and nationality were of crucial importance in acquiring pragmatic competence.

We believe that cross-cultural communication relies upon various sets of conversational cooperation, leading to a successful negotiation of meaning (Thomas, 1995). Here, being relevant is the ultimate goal that any communicator tries to reach cognitively. Sperber and Wilson (1986) strongly emphasize the importance of not clinging literally to conversational maxims and principles if one wants to attain relevance. In the case of Arab speakers of English, some strive to attain communicative relevance through relying upon available contextual clues; depending on their available background knowledge, their communication in English may either fail or succeed. The very idea of processing meaning, according to Sperber and Wilson, involves the fact that interlocutors spend time in processing what they hear in order to decode its meaning, and then filter the possible choices to reach the most plausible ones. Psychologically speaking, every individual has a particular ability to listen to and process contextual utterances (Lachman, Lachman, & Butterfield, 1979; Oomen & Postma, 2001); in other words, every interlocutor has a specific ability of comprehending meaning (as this is also reflected in the speed of answering a particular question). The interlocutor's ability, however, to grasp an implicature is dependent upon his/her cultural background, religion, personal ethics, level of intelligence, availability of contextual clues, and body language, which makes it a daunting task for foreign learners of English to understand implied meanings in English. In addition, the speed of comprehension is affected negatively by some learners' efforts to achieve accuracy of expression; in its turn, this influences upon learners' abilities to practice contextual inferencing. Here, accessible anaphoric relations in a text may help foreign learners of English to recover meanings, which again will lead to their faster recovery of meanings (Just & Carpenter, 1980; Swinney, 1979; Till, Mross, & Kintsch, 1988). The problem is aggravated when foreign learners simply fail to recover implied meanings. Naturally, native speakers are more capable of anticipating meanings in discourse because they

are used to English discursial routines (Tsui, 1994); in contrast, non-native speakers are not aware of such routines, nor are they aware of the expectations that hold in English discourse. Knowing what to expect in discourse is very useful in recovering implied meanings in any language, and this invaluable cognitive source is absent in the case of foreign learners of English.

### *3. Conversational Implicatures as an Integral Part of Teaching Pragmatic Competence*

Some of the most intricate problems in foreign language acquisition belong in the area of pragmatic competence. According to Yule, pragmatic competence is "the ability to deal with meaning as communicated by a speaker (or writer) and interpreted by a listener (or reader) ...[and to interpret] people's intended meanings, their assumptions, their purposes or goals, and the kinds of actions (for example, requests) that they are performing when they speak" (Yule, 1996: 3-4). The intricacy of this enterprise is attributed to the impossibility of learning what is implied in discourse unless certain resources of knowledge are available to the interlocutors. According to some pragmaticians like Jef Verschueren, implicature is a meaning "that goes beyond what is given by the language form itself or what is literally said" (Verschueren, 1999: 25). Jacob Mey (1993, 2001) also emphasizes the same idea: implicature is about the unsaid that needs to be recovered. Michael Haugh takes a different, Neo-Gricean view by saying that "the notion of implying underlying implicature can be characterized in terms of four properties: It is not literally said, it is inferred in a particular context, it is defeasible, and it is meant in addition to what is literally said" (Haugh, 2006: 84-110). This stance draws a sharp distinction between what is actually implied in discourse and what is explicitly said, using a different wording.

Teaching pragmatic comprehension can critically enhance foreign learners' ability to understand language and to react to it. The question how to teach pragmatics to non-native speakers of English is indeed very difficult to answer. Some attempts such as those by Kasper and Bardovi-Harlig, have been more successful than others. Compare what Kasper says " Competence is a type of knowledge that learners possess, develop, acquire, use or lose. The challenge for foreign or second language teaching is whether we can arrange learning opportunities in such a way that they benefit from the development of pragmatic competence in L2." (Kasper, 1997:1-2)

It is clear that we have to develop tools for our foreign learners to help them to develop their pragmatic competence. The question that arises then is: Are strategies of attaining relevance similar to those employed in English? We will try to come up with an answer, which we hope that our readers find convincing and relevant to our assumption. Some researchers believe that prompt access to lexical reservoirs and memory resources affect the level of linguistic performance in general (Robinson, 2003; Segalowitz & Freed, 2004). This stance clearly indicates that in order for foreign learners of English to improve their proficiency in English, they should have the cognitive readiness without which their learning process will definitely be sluggish and fraught with difficulties.

#### *4. Analysis*

To guarantee the value and objectivity of this study, subjects were chosen randomly among students at GUST. A survey was distributed to test their ability in recovering implicatures in certain utterances. The questions were devised such that they would breach conversational maxims and hence generate conversational implicatures.

Some questions were based on particular Arabic maxims in order to check the students' ability to identify those generated implicatures which are culturally bound. The remaining questions were based on an English cultural background; they were read and checked for validity by two native speakers.

In the following example, Sami's answer is based on knowing a particular saying, used mainly in the Arabian Gulf region. If a man does not marry a woman of his same ethnic origin, he will definitely fail in his marriage. Most respondents knew the answer to this question, which depends on their cultural background. Relevance is achieved by most respondents (84/130) due to their prior knowledge of this saying.

(Violating maxim of relevance)

**Ali and Sami are discussing marital problems. Sami is expressing his opinion on mixed marriages:**

Ali: Isn't it wonderful to marry a girl from a different cultural background?

Sami: The best patch should be made of the same fabric.

What does Sami exactly mean?

- a. He is against mixed marriages.
- b. He approves of mixed marriages.
- c. He doubts the usefulness of mixed marriages.

In the next example, respondents could not identify the reason behind B's positive reply, nor could they figure out why wearing a red shirt would not be considered elegant in their context. 41/130 respondents picked the wrong answer. Again, the respondents' cultural background contributed to their decisions. In fact, the majority of respondents considered wearing a red shirt to be a sign of elegance, which is why they chose the first answer.

**Two friends are commenting on the appearance of a new visitor to their club:**

A: We have had so many visitors lately. But, this one is the most elegant indeed.

B: You are right, especially his red shirt. It's one of a kind.

What does 'B' exactly mean?

- a. The visitor is very elegant.
- b. The visitor's red shirt is a sign of his poor taste.
- c. The visitor's appearance is praiseworthy.
- d. The visitor's clothes are very well chosen.

Table 1 shows the frequency of answering the 18 questions in the survey (a total of 130 respondents).

Questions	Frequency of answer (a)	Frequency of answer (b)	Frequency of answer (c)	Frequency of answer (d)	Total of respondents
Question 1	72	28	10	20	130
Question 2	62	43	13	12	130
Question 3	65	40	25	not applicable	130
Question 4	84	17	29	not applicable	130
Question 5	36	64	30	not applicable	130
Question 6	71	25	21	13	130
Question 7	51	55	24	not applicable	130
Question 8	41	39	19	31	130
Question 9	25	24	35	46	130
Question 10	71	23	20	16	130
Question 11	14	24	18	74	130
Question 12	31	50	28	21	130
Question 13	48	25	17	40	130
Question 14	34	53	43	not applicable	130
Question 15	40	15	66	9	130
Question 16	21	35	57	17	130
Question 17	23	33	28	46	130
Question 18	44	24	16	46	130

Table 1: Frequency table



Table 2 shows the connections between questions in the survey based on generating the same maxim. Respondents who correctly answered question 2, for instance, were likely to correctly answer questions 8, 11, 14, and 18 respectively. The same applies to the rest of the implicatures generated in each question in the survey.

QUANTITY	RELEVANCE	MANNER	QUALITY
2	4	3	1
8	6	5	12
10	7		17
11	9		
14	13		
18	15		
	16		

Table 2<sup>1</sup>

Here is a list of the questions that generate the Quantity maxim:

**2. John has a famous racehorse. He has been approached by many people to buy this exceptional horse. Jonathan is one of those interested people:**

Jonathan: Respectable Mr. John! Don't you have a famous beautiful horse called "the impeccable"?

John: Yes sir, I do have a beautiful horse called "the impeccable".

What is it that John is implying here?

- a. He is emphasizing his possession of the horse, "the impeccable".
- b. He is happy to know that his horse is so famous.
- c. He is not ready to sell the horse.
- d. He is angry at Jonathan; therefore, he repeats his words.

**8. Two friends are commenting on the appearance of a new visitor to their club:**

A: We have had so many visitors lately. But, this one with the red shirt is the most elegant indeed.

B: You are right, especially his red shirt. It's one of a kind.

What does 'B' exactly mean?

- a. The visitor is very elegant.
- b. The visitor's red shirt is a sign of his poor taste.
- c. The visitor's appearance is praiseworthy.
- d. The visitor's clothes are very well chosen.

**10. Two people are commenting on the up coming American Presidential elections.**

A: I think the Democrats are going to win the elections this year.

B: The Republicans are the Republicans.

What does 'B' mean?

- a. The Democrats will win the elections.
- b. The Republicans will win the elections.
- c. The Democrats might win the elections.
- d. The Republicans might win the elections.

**11. John asks Smith:**

John: I heard that you got a substantial raise. Congratulations!

Smith: Yea indeed. Substantial enough to go to the Zoo next week.

What does Smith mean?

- a. Smith will go to the Zoo next week.
- b. Smith will have enough money to go to the Zoo.
- c. Smith is satisfied with his raise.
- d. Smith is not satisfied with his salary raise.

**14. A to B:**

A: I love to buy new and modern things.

B: New spins on old thoughts.

What does 'B' mean?

- a. New things are better than old things.
- b. Old things are better than new things.
- c. None of them is better than the other.

**18. Two brothers are discussing the status of their inherited land.**

A: My father promised me this piece of land. I was the only one who helped him cultivate it.

B: It is your land. It was also you who raised the cattle and harvested the crops.

What does 'B' mean?

- a. He agrees with what 'A' says.
- b. He partially agrees with what 'A' says.
- c. He totally disagrees with 'A'.
- d. He disagrees and also shows 'A' that he is lying.

Here is another list of the questions that generate the quality maxim:

**1. 'A' to 'B':**

A: How much are you paid monthly?

B: Sufficient to buy a Rolls Royce

What does 'B' exactly mean?

- a. His salary is big enough to buy a Rolls Royce.
- b. His salary is not sufficient at all.
- c. He is angry at A's question.
- d. He is an important employee.

**12. John was giving a speech when 'A' entered the grand hall to listen to him. 'A' asks 'B':**

A: What did John say?

B: I didn't hear him well, but he was talking about mass media.

What does 'B' mean?

- a. He did not understand what John said.
- b. He thought that what John said was not important to him.
- c. He believed that John was not convincing.

**17. 'A' and 'B' have attended John's dissertation defense.**

A: Have you listened to John's extraordinary defense of his Ph.D. dissertation?

B: I liked the colors he used in his power point presentation.

What did 'B' exactly mean?

- a. He liked John's defense.
- b. He didn't like his defense.
- c. He partially liked it.
- d. He found it boring.

The following findings are warranted based on the data in Tables 1 and 2:

- Having answered the first question correctly in accordance with the quantity maxim, the probability of correctly responding to subsequent questions dealing with the quantity maxim ranges roughly from 20% to 50%.
- A significant observation concerning the data for the quantity maxim is that the probability of answering question 10 correctly is equivalent to that of answering question 14 correctly, i.e. 38%, which is high in comparison to the average percentage of correct answers for this maxim (31.8%).
- Taking the relevance maxim into consideration, the average percentage of correct answers is 44.8%.
- Having correctly answered the first question under this maxim, the probability of subjects correctly answering the succeeding questions under the same maxim is roughly between 36% and 60%.
- As we move forward in the chain of questions, there is an overall increase in correct answers for subsequent questions. Under the manner maxim, the probability of obtaining a correct answer to question 5, given that question 3 was answered correctly, is as high as 49.6%.
- Similarly, for the quality maxim, the probabilities of answering questions 12 and 17 correctly, after answering question 1 correctly, are 38.5% and 35.4% respectively, which are higher than the average correct answers for this maxim, 27.2%.

### 5. Statistical Analyses

In the following, we will provide statistical analyses of some of the examples, based on a probability metric.

**Example 1:** We refer to the first finding (see Table 2), viz., that the probability of correctly responding to subsequent questions under the quantity maxim ranges roughly from 20% to 50% (the questions that are categorized under the quantity maxim are 2, 8, 10, 11, 14, and 18).

Let  $P(A)$  be the probability of answering a subsequent question correctly where event  $A$ , being a changing variable, is the question under investigation. The condition or restriction given after "|" is the event  $B$ , which is question 2. This is the first question under the quantity maxim, which has been answered correctly. Event  $A$  is represented by questions 2, 8, 10, 11, 14, and 18.

For subjects having answered question 2 correctly,

- The probability of answering question 8 correctly is:

$$P(Q8 | Q2) = \frac{P(Q8 \cap Q2)}{P(Q2)} = \frac{3/130}{13/130} = \frac{3}{13} = 0.23$$

- The probability of answering question 10 correctly is:

$$P(Q10 | Q2) = \frac{P(Q10 \cap Q2)}{P(Q2)} = \frac{5/130}{13/130} = \frac{5}{13} = 0.38$$

- The probability of answering question 11 correctly is:

$$P(Q11 | Q2) = \frac{P(Q11 \cap Q2)}{P(Q2)} = \frac{6/130}{13/130} = \frac{6}{13} = 0.46$$

- The probability of answering question 14 correctly is:

$$P(Q14|Q2) = \frac{P(Q14 \cap Q2)}{P(Q2)} = \frac{5/130}{13/130} = \frac{5}{13} = 0.38$$

- The probability of answering question 18 correctly is:

$$P(Q18|Q2) = \frac{P(Q18 \cap Q2)}{P(Q2)} = \frac{2/130}{13/130} = \frac{2}{13} = 0.15$$

We note that for subjects having answered question 2 correctly, the probability of answering questions 8, 10, 11, 14 and 18 is rather low: 23%, 38%, 46%, 38%, and 15% respectively. The data suggests that there is a low dependence of correctness in all those questions, clearly implying that the students' ability to interpret the implicatures in their respective contexts similarly was low. If we benchmark 70% as a satisfactory understanding of implicatures for non-native speakers of English, then, in fairness, it is clear that our English teaching should incorporate these aspects of pragmatics, and consequently, a significant number of such courses should be taught at GUST, whenever possible.

We also introduced an arbitrary bound from 45% to 69% to indicate the degree to which the ability to recuperate appropriate implicatures has improved: scoring higher than 45% is certainly promising in terms of performance. In this regard, the number 0.46 in the data (interpreted as 46%, indicating the probability of answering question 12 correctly upon having answered question 2 correctly), deserves further investigation in subsequent surveys. The interesting question here is why the students did relatively better in this particular scenario, compared to the rest.

Moving down the chain of questions under the quantity maxim, the preliminary condition changes accordingly:

For subjects having answered question 8 correctly,

- The probability of answering question 10 correctly is:

$$P(Q10|Q8) = \frac{P(Q10 \cap Q8)}{P(Q8)} = \frac{10/130}{39/130} = \frac{10}{39} = 0.26$$

- The probability of answering question 11 correctly is:

$$P(Q11|Q8) = \frac{P(Q11 \cap Q8)}{P(Q8)} = \frac{22/130}{39/130} = \frac{22}{39} = 0.56$$

- The probability of answering question 14 correctly is:

$$P(Q14|Q8) = \frac{P(Q14 \cap Q8)}{P(Q8)} = \frac{14/130}{39/130} = \frac{14}{39} = 0.36$$

- The probability of answering question 18 correctly is:

$$P(Q18|Q8) = \frac{P(Q18 \cap Q8)}{P(Q8)} = \frac{13/130}{39/130} = \frac{13}{39} = 0.33$$

We observe now that even for subjects who answered question 8 correctly, the probability of correctly answering questions 10, 11, 14 and 18 is still very low: 26%, 56%, 36%, and 33% respectively. The data exhibits a pattern of low correctness correlation for questions 10, 11, 14 and 18, in contrast to the 56% for question 11. The same inference holds as before.



Next, we look at question 10.

For subjects having answered question 10 correctly,

- The probability of answering question 11 correctly is:

$$P(Q11|Q10) = \frac{P(Q11 \cap Q10)}{P(Q10)} = \frac{6/130}{23/130} = \frac{6}{23} = 0.26$$

- The probability of answering question 14 correctly is:

$$P(Q14|Q10) = \frac{P(Q14 \cap Q10)}{P(Q10)} = \frac{11/130}{23/130} = \frac{11}{23} = 0.48$$

- The probability of answering question 18 correctly is:

$$P(Q18|Q10) = \frac{P(Q18 \cap Q10)}{P(Q10)} = \frac{4/130}{23/130} = \frac{4}{23} = 0.17$$

As before, the probability of subjects correctly answering question 18, given that question 14 has been answered correctly, is 48%; this observation deserves further scrutiny in future studies. The pattern in which all other probabilities are low is still maintained, and a similar conclusion can be drawn as before.

For subjects having answered question 11 correctly,

- The probability of answering question 14 correctly is:

$$P(Q14|Q11) = \frac{P(Q14 \cap Q11)}{P(Q11)} = \frac{26/130}{74/130} = \frac{26}{74} = 0.35$$

- The probability of answering question 18 correctly is:

$$P(Q18|Q11) = \frac{P(Q18 \cap Q11)}{P(Q11)} = \frac{36/130}{74/130} = \frac{36}{74} = 0.49$$

Finally, for subjects having answered question 14 correctly, the probability of answering question 18 correctly is

$$P(Q18|Q14) = \frac{P(Q18 \cap Q14)}{P(Q14)} = \frac{19/130}{53/130} = \frac{19}{53} = 0.36$$

We again observe the scenario of low probabilities of answering the above questions correctly. The only exception is the probability of a correct answer to question 18, given that question 11 has been answered correctly. That percentage is 49%, which is markedly higher than the rest and, therefore, warrants further investigation in future surveys.

**Example 2:** We refer to the second finding (see after Table 2), viz, that for this quantity maxim, the probability of answering question 10 correctly is equivalent to that of answering question 14 correctly, i.e. 38%, which is high in comparison to the average percentage of correct answers for this maxim (31.8%).

Here, the condition is that question 2 under the quantity maxim has been answered correctly.

Consequently, the probabilities of answering question 10 and 14 correctly are, in fact, equal, as can be seen from the following calculations:

For subjects having answered question 2 correctly,

- The probability of answering question 8 correctly is:

$$P(Q8|Q2) = \frac{P(Q8 \cap Q2)}{P(Q2)} = \frac{3/130}{13/130} = \frac{3}{13} = 0.23$$

- The probability of answering question 10 correctly is:

$$P(Q_{10} | Q_2) = \frac{P(Q_{10} \cap Q_2)}{P(Q_2)} = \frac{5/130}{13/130} = \frac{5}{13} = 0.38$$

- The probability of answering question 11 correctly is:

$$P(Q_{11} | Q_2) = \frac{P(Q_{11} \cap Q_2)}{P(Q_2)} = \frac{6/130}{13/130} = \frac{6}{13} = 0.46$$

- The probability of answering question 14 correctly is:

$$P(Q_{14} | Q_2) = \frac{P(Q_{14} \cap Q_2)}{P(Q_2)} = \frac{5/130}{13/130} = \frac{5}{13} = 0.38$$

- The probability of answering question 18 correctly is:

$$P(Q_{18} | Q_2) = \frac{P(Q_{18} \cap Q_2)}{P(Q_2)} = \frac{2/130}{13/130} = \frac{2}{13} = 0.15$$

The conclusions drawn from example 2 above do not differ from the previous conclusions based on example 1. Evidently, obtaining a high correlation of correctness in answering the questions should be our prime concern in delivering the pragmatic skills that are required to correctly draw the implicatures. Hence, this should be our central focus in imparting pragmatic skills. The question is how to best implement this focus judiciously, so that in the long run, we can reach a minimum of 70% correctness in answering the questions.

## 6. *Conclusion*

The analysis was based on an eighteen-question survey given to 130 Arab freshmen and sophomore students, enrolled in GUST's ESL programme. The most striking observation in the data for the quantity maxim is that the probability of answering question 10 correctly is equivalent to that of answering question 14 correctly, i.e. 38%, which is high in comparison to the average percentage of correct answers for this maxim (31.8%). It will be useful to follow up results like these in subsequent studies. Our survey was specifically designed to test the respondents' ability to recover conversational implicatures. The questions were arranged such that students who correctly answered question 2, for instance, were expected to answer questions 8, 10, 11, 14, and 18 correctly as well. By not answering these questions correctly, the respondents obviously did not apply the logic that their native English-speaking interlocutors would have expected them to. The disparity amongst students in answering our questions clearly shows that some of them misunderstood the implied meanings of the respective utterances.

The statistical method that the present researchers applied in this study has helped us to reach our conclusions more efficiently, and thus serves to provide a definitive answer to the main question behind this research: Is using a near-statistical dependency approach a valid tool in testing the recovering of implicatures? Our answer to this question is affirmative. As to the second question of this research: Are strategies of attaining relevance in other languages similar to those employed in English? we saw that respondents who answered the questions, based on their particular cultural background, failed to recover implicatures in the utterances that require a different cultural knowledge. This obviously means that the native logic which they applied did not help them recover implicatures properly – which shows beyond doubt that teaching

non-native students the hidden pragmatic strategies of English can definitely help them in applying the right logic in recovering appropriate implicatures.

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### **Note**

1. In Table 2, numbering is based on the sequence of scalar violations of maxims, as based on the survey.

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## Appendix

### Theory

The word "chance" may be used (non-technically) to understand the meaning of probability.

We use the well-known notation  $P(A|B)$  to represent the conditional probability of event A given that the event B has occurred. So for any two events A and B with  $P(B) \geq 0$ ,

$$P(A|B) = \frac{P(A \cap B)}{P(B)} \quad (1)$$

The definition of conditional probability helps us to update the probability of  $P(A)$ , originally assigned to A, when we are aware of that another event B has occurred which has resulted in a change in the chance of A occurring. In (1),  $P(A \cap B) = b$  means the probability of event A intersecting with event B, (referring to the common area b of the events A and B, see Fig.1).



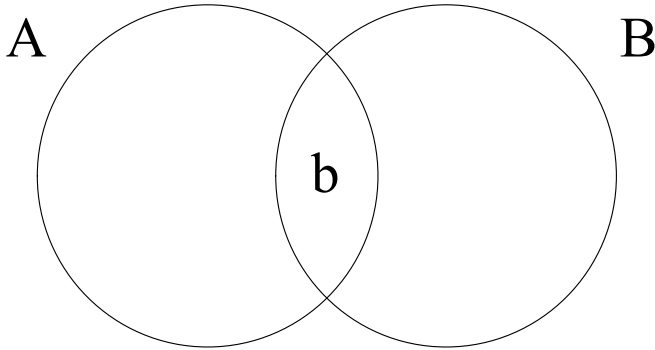


Fig. 1.

Two events A and B are independent if

$$P(A|B) = P(A) \quad (2)$$

and are dependent otherwise. In other words, using (2) in (1), we can state equivalently that A and B are independent if and only if

$$P(A \cap B) = P(A)P(B) \quad (3)$$

### The Theory Adopted in the Paper

Besides looking at how close by our survey match (2), above, our approach is to look for dependence between the events A and B. If the conditional probability  $P(A|B)$  is equal to  $P(B)$ , then we say the conditional probability has **complete dependence** on the event B. In other words, (2) is rewritten as

$$P(A|B) = P(B) \quad (4)$$

