

# Identifying Social and Expressive Factors in Request Texts Using Transaction/Sequence Model

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## Abstract

The paper focuses on requests in written forms, where we describe a novel approach to computational modelling of specific features of politeness in speech act of requesting. We examine the similarities and differences in the use of specific social and expressive factors in two languages (mother tongue and a foreign language). The requests collected from different social situations among students and their teachers in a university environment were used as data source for a research. Transaction/Sequence model for text representation was formulated and association rules analysis was applied as a research method. The findings are interesting mainly in terms of differences in the use of politeness features in foreign language and mother tongue. The results indicated that the requests written in mother tongue are less direct than in foreign language.

## 1 Introduction

Natural language is the most effective tool to perform speech acts in human communication (giving commands, making requests, apologies, thanks etc.). These speech acts are performed according to certain rules and principles. One of these principles is politeness, which has been discussed by many linguists (Awedyk, 2006; Blum-Kulka et al. 1989; Hill et al., 1986; Lakoff, 1973; Tannen, 1986; Wierzbicka, 1985; Watts et al., 1992, Munková et al., 2012) and others. Politeness communication represents one of the basic topics of successful implementation of language functionality and development of communicative competence (Hymes, 1996; Canale and Swain, 1980). Politeness functions and culture-specific features are associated with certain expressions, and grammatical constructions belong

to language functionality in a given language. Based on them we may compare different languages. Researches examining various speech acts in many different languages have provided valuable insights into culture-specific features of politeness in many different languages (Lid-dicoat et al., 2003) and others.

The politeness theory we used when examining the production of speech acts of the requesters is the Brown and Levinson model (1987) that is, in various elaborated forms, still applicable today and forms the basis for newer models and definitions of politeness (Scollon and Scollon, 1995; Yabuuchi, 2006). Each interlocutor creates his/her own unique speech acts (Cohen, 1996; Searle, 1979) and within them s/he uses factors of politeness in various combinations and meanings.

We therefore believe that it is important to examine the rules of production of politeness speech acts, which the interlocutors use in the production of their spoken and written utterances.

The graphic form of the human communication is a written text, mostly unstructured, providing various kinds of information between the sender and the receiver, suitable mainly for a particular research or text mining.

Text mining includes several research areas. Similarly to KDD (Knowledge Discovery in Databases) statistical methods and methods of machine learning are tools for data analysis in text mining (Hearst, 1999; Sullivan, 2001). On the other hand, text mining is mainly based on theoretical and computational linguistics by data pre-processing (Neuendorf, 2002; Titscher et al., 2002; Hajičová et al., 2003; Weiss et al., 2005).

In our paper, we focus on an unstructured text - a request, where we try to find the similarities and differences in the use of chosen social and expressive factors in mother tongue (L1) and foreign language (English, L2). For this purpose, transaction/sequence model was formulated and the data - requests from the various social situa-

tions among students and their teachers in a university environment in both languages were collected. Cross-tabulation analysis and association rules were applied.

The rest of the paper is structured as follows. The next chapter deals with the request from the point of view of a speech act. The third chapter introduces some related papers written by authors doing research work in the same or similar field of interest. The methods and rules of data preprocessing are described in the fourth chapter, where we focus on information extraction from a text, specially the keywords - social and expressive factors were defined. The transaction/sequence model is described in the fifth chapter. The following chapter focuses on specific linguistic data analysis. At the end, we discuss the obtained results from the cross-tabulation analysis and association rules.

## 2 Request as a Speech Act

A request is a speech act whereby a requester conveys to a requestee that he/she wants the requestee to perform an act which is for the benefit of the requester (Trosborg, 1995). The act may be a request for an object, an action or some kind of service, etc. – a request for non-verbal items or services. Or it can be a request for information - a request for verbal items or services.

The speech acts of requesting become very popular in cross-cultural and interlanguage pragmatic studies. Their social function consists of getting the requestee to do something for the requester (Searle, 1979). According to Barron (2008) requests represent problematic areas for learners of all cultural backgrounds, even for advanced students.

The order, association and variability of the features of politeness are different in every language and culture, because they are based on different association rules in the given culture – based on general but also on individual level.

The requester has many features to formulate a request, which are usually classified according to a specific structure (culturally given). Blum-Kulka et al. (1989) defined three elements of a request sequence in addition to the Head Act: alerters, supportive moves (external modifiers) and internal modifications.

The function of alerters is to alert requestee's attention to the upcoming speech act (Blum-Kulka et al., 1989). External modifiers involve: preparators, disarmers, sweeteners, supportive

reasons, and cost minimizing (Edmondson and House, 1981; House and Kasper, 1981; Faerch and Kasper, 1989; Trosborg, 1995). The function of internal modifications is to soften or increase the impact of a request. These devices are referred to as modality markers, and are divided into two groups: a) syntactic downgraders, lexical/phrasal downgraders – they decrease the impact of a request, and b) upgraders - intensify the force of a request (House and Kasper, 1981; Trosborg, 1995; Faerch and Kasper, 1989).

The emphasis which the requester makes in carrying out a request can be realised in several perspectives. Blum-Kulka and Olshtain (1984) distinguish the following perspectives of a request: a) Requester (Speaker) - oriented, b) Requestee (Listener) - oriented, c) Speaker and Listener - oriented and d) Impersonal.

## 3 Related Work

There is a considerable range of studies on culture-specific preferences of the Speech act of requesting, such as British English, American English, Irish English, Australian English (Barron, 2008), Canadian French (Blum-Kulka and House 1989), Argentinean Spanish (Faerch and Kasper 1989; House 1989), German (Faerch and Kasper 1989; House 1989; Barron 2008), Turkish (Marti 2006; Otcu and Zeyrek 2008) and many more.

There is also a number of studies which deals with requests illustrating the culture-specific discrepancies in carrying out the requests between two different languages (Barron, 2008; Awedyk, 2006; Byon, 2006; Márquez Reiter et al., 2002; Fukushima, 2000; Lubecka, 2000; Sifianou, 1992; Blum-Kulka et al., 1989; House, 1989) and others.

Interlanguage studies have proven that there are significant differences not only between two languages but also between mother tongue (L1) and foreign language (L2) in bringing across the intended illocutionary force of a request (Eslami and Noora, 2008; Woodfield, 2008; Otcu and Zeyrek, 2008; Félix-Brasdefer, 2007; Hassall, 2003; Trosborg, 1995).

Although a number of language researches has been conducted, especially for languages being so popular and dominant such as English, German or Spanish; little is known about the culture-specificity of Slovak requests. Therefore, one of the goals presented in this paper is to provide an insight into culture-specific preferences in Slovak requests.

## 4 Information Extraction from the Texts

Text sources in natural language offer lots of information, but not all of them are suitable for computational analysis. Though by using software for linguistic data preparation, large amounts of sources can be sorted out and useful information from the individual words, phrases or sentences can be extracted. Therefore the gist of information extraction is the identification of specific information, in our case the expressive and social factors. This identification helps us in computational modelling and understanding of the culture-specific features of politeness in speech acts of requesting not only in interlanguage (English) but also in mother tongue.

Methods based on rules and statistical methods are used to identify specific information. The methods based on rules, which we also used in our case, are based on fixed characteristics under which they are generated (e.g. association or sequence rules). We chose them because they are appropriate for specific tasks such as extraction of social and expressive factors. We used classification of politeness factors in line with Trosborg (1995) and Díaz-Pérez (2003) and we defined the following 9 factors:

- *Alerters* - a combination of salutations, a form to express a social role: e.g. addressing people (title, first name, last name, friendly appeal markers). - F1
- *Requester's perspective*: e.g. could I, may I etc. - F2
- *Requestee's perspective*: e.g. can you, would you etc. - F3
- *Politeness markers* - e.g. thank you, please - immediately before or after the request core. - F4
- *Pre-sequences* - elements before the core of a request. - F5
- *Post-sequences/supporting details* - features after the expressed request. - F6
- *Mitigating devices* - features expressing an apology for disturbing. - F7
- *Minimizers* - features minimising the impact of a request. - F8
- *Compliments* - features intensifying the likelihood of a request fulfilment. - F9

The first three represent social factors and the rest are expressive factors (supportive moves).

## 5 Transaction/Sequence Model

Text mining is analogous to Knowledge Discovery in Databases (KDD). Sometimes it is enough to slightly adapt the existing methods and procedures from other areas of knowledge discovery. In our case we chose a representation of examined request text similar to bag-of-words model. We used the Transaction/Sequence model for text representation, which allows us to examine the relationships between the examined attributes and search for associations among the identified keywords in texts of requests. Similarly, like in shopping cart analysis, a transaction represents one purchase, or in web analysis it represents the set of user's visited pages during one session, in our case it is a set of keywords in text of request. It is similar to bag of words model.

The structure and data character predetermine the use of specific methods for analysis – data modelling. In case of the use of transaction/sequence model for text representation, it is mainly association rule analysis and sequence rule analysis. The difference between the association and the sequence rule analysis is that we do not analyse the sequences but the transactions in association rule analysis, which means, we do not include the sequence variable representing the order of the key words in text into the analysis. The transaction represents a set of the key words of the text, whereby the order of occurrence of the identified key words in the given text is not taken into account.

Case	St.	Sit.	Lan.	T/S ID	Fac.	Seq.
1779	46	S5	FL	46#S5# FL	F4	1
1780	46	S5	FL	46#S5# FL	F2	2
1781	46	S5	FL	46#S5# FL	F5	3
1782	47	S5	MT	47#S5#MT	F1	1
1783	47	S5	MT	47#S5# MT	F2	2
1784	47	S5	MT	47#S5# MT	F5	3

**Table 1.** Transaction/Sequence Model of request texts.

Examined variables:

*Student* - Student ID who produced the given request.

*Situation* – Social situations- requests, the written requests were classified into five individual

categories in line with Díaz-Pérez (2003) and Trosborg (1995).

*Language* - a language of request produced in (foreign language (FL) and mother tongue (MT)).

*Transaction/Sequence ID* - a set ID of key words in request text, it consists of previous three variables (Student ID, Situation and Language).

*Factor* - a key word represents social or expressive factors.

*Sequence* - an order of occurrence of key words in text of particular request.

## 6 Linguistic data analysis

### 6.1 Cross-tabulation analysis

In our case, a cross-tabulation analysis consists of an analysis of texts of requests formulated in mother tongue (MT) and in foreign language (FL, English). These texts of requests were collected from department of translations studies and department of American and English studies, where students studying linguistics have to communicate (in spoken and written form) among them and their teachers not only in a mother tongue but also in English language. We collected 1000 requests in total (500 English requests and 500 Slovak requests).

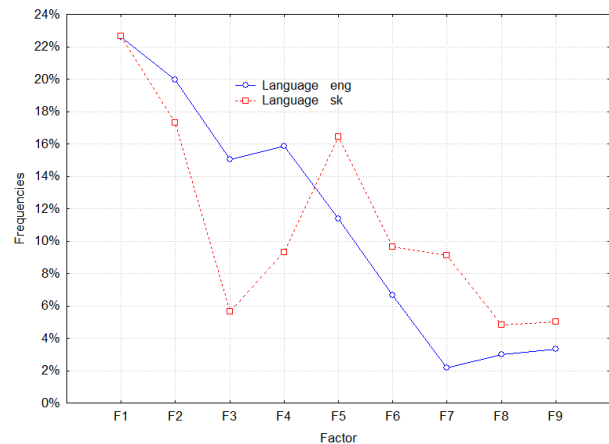
With the help of the cross-tabulation analysis we investigated whether there is a difference in the use of various factors in mother tongue (MT) and foreign language (FL, English).

	Chi-square	df	p
<b>Pearson</b>	114.9155	8	0.0000
<b>Cont. coeff. C</b>	0.2434		
<b>Cramér's V</b>	0.2509		

**Table 2.** Results of cross-tabulation analysis MT vs. FL.

The only requirement (a validity assumption) of the use of chi-square test is a large amount of expected frequencies. The requirement is not violated, the expected frequencies  $e_{ij} = r_{is}j/n$  are large enough (i.e. they are positive and not more than 20% of  $e_{ij}$  are less than 5,  $e_{ij} > 34.36$ ). The contingency coefficient represents the degree of dependence between two nominal variables. The value of coefficient (Table 2) is approximately 0.25, where 1 means perfect dependency and 0 means independency. There is a medium dependency between the occurrence of individual factors of politeness and the language in case of MT vs. FL, the contingency coefficient is statistically significant. The zero hypotheses (Table 2)

are rejected, i.e. the occurrence (use) of individual factors of politeness depends on the language (MT or FL). The graph (Fig. 1) shows the interaction frequencies *Language x Factor*.



**Figure 1.** Interaction Plot - *Language x Factor* MT (red course) vs. FL (English, blue course)

The graph presents a categorized polygon, where the factors of politeness are on the x axis and the observed frequencies of their usage (the occurrence) are on the y axis; while for each level of the variable Language one polygon is depicted. If the curves copy each other – they show the same course, the use of individual factors of politeness does not depend on the selected language. And vice versa, if there is any defined degree of dependence, the curves would not copy each other – this is what the results of analysis have confirmed. We can observe different course for FL (English) and a different one for MT. As we can see on the graph (Fig. 1), the differences are mainly in factors F3, F4, F5 and F7. The factors F3 and F4 are considerably less used in MT than in FL. Factor F3 – the requestee’s perspective represents a more direct and shorter utterance of a request. In terms of frequency, factor F2 – the requester’s perspective is much more preferred in the decision of perspective in mother tongue and also in foreign language. It means that an indirect utterance of a request and an attempt to avoid a direct addressing of requestee is more preferred. Factor F2 reduces the impact of a request. Using these formulations a requester takes over a part of “the effort” needed to fulfil the request upon him/herself, assuming that the potential “alleviation” increases the likelihood of a request fulfilment. Factor F4 is considerably less used in mother tongue, that shows the requester’s knowledge of politeness structures in FL with factor F4 - a politeness marker (with

words such as please or thank you) - formulated in requests in comparison to MT. On the contrary, factors F5 and F7 are much more used in FL. These are expressive factors. When the requester uses factor F5, he/she assumes that by explaining the reasons to the requestee and the requestee's potential understanding of the reasons of his/her request may increase the likelihood of the fulfilment of a request. Consequently, the requester appeals to the empathy and imagination of the requestee, since he/she considers their influence as an effective strategy. Factor F7 - mitigating devices - reduce the impact of a request on the requestee, in terms of whether the requester does not interfere or over-interfere with his/her request in the requestee's time, space or decision making.

## 6.2 Association rule analysis

The association rule analysis represents a non-sequential approach to the data being analysed. We will not analyse the sequences but transactions, so we will not include the order of factors used into the analysis. In our case, a transaction represents the set of factors observed in the texts of requests separately for foreign language (FL) and mother tongue.

The web graph (Fig.2) depicts the discovered association rules for the texts of requests written in FL, specifically the size of node represents the support of occurrence of the politeness factor, the thickness of the line represents the support of rule – pairs of factors (probability of occurrence in the pair) and the darkness of the line colour presents a lift of the rule – the probability of a pair occurrence in transaction separately. We can see from the graph (Fig. 2) that the factors of politeness F2, F1, F4 and F3 (support > 51%) belong to the most frequently used factors. Similarly, like the combination of these factors` pairs F1, F2; F2, F4, and F1, F3 (support > 39%), the factors F5==>F3, F5==>F1, F2==>F4 and F1==>F3 occur in sets of factors of politeness more often together than as separate units (lift>1.11). In these cases the highest degree of interestingness was achieved – the lift, which defines how many times the selected factors of politeness occur more often together as if they were statistically independent. In case, that the lift is more than 1, the selected pairs occur more often jointly than separately in the set of used factors of politeness. It is necessary to take into account that in characterising the degree of interestingness – the lift, the orientation of the rule does not matter.

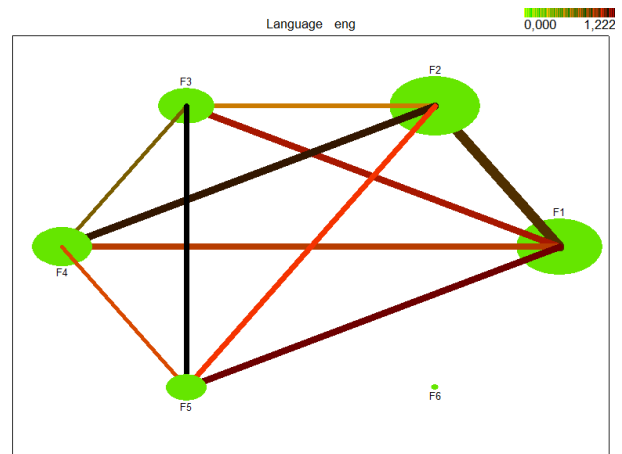


Figure 2. Web graph – a visualization of the discovered rules – Foreign language

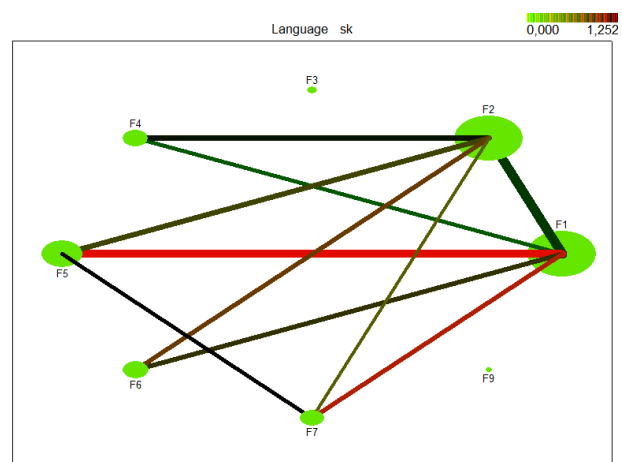


Figure 3. Web graph – a visualization of the discovered rules – Mother tongue

We found different association rules for texts of requests written in MT than for FL. The web graph (Fig. 3) illustrates the discovered association rules. The most frequently used factors of politeness are F1, F2 and F5 (support > 49%), as well as their pairs F1, F2 and F1, F5 (support > 43%). The factors F7==>F5, F5==>F1, F4==>F2, F1==>F7 and F6==>F1 occur more often together in transactions of used factors of politeness than separately (lift>1.02).

## 7 Discussion and Conclusion

Based on computational modelling, the present research compared the pragmalinguistic knowledge of speech act (culture-specific features) use of Slovak native speakers (L1) and advanced ESL learners, students studying linguistics (L2), in requests formulation. It identified significant differences in social and expressive factors, which help us to understand the influence of mother tongue, specially, requester's

experience in L1, on request formulation in FL (L2), in interlanguage.

The politeness structure of the Slovak language has so far been investigated very peripherally. Therefore, in terms of comparison with Germanic and Romance languages this investigation is unique, and based on its results we can speculate not only about the decrease of transference regularities, but also about the politeness in Slovak language as such.

If we look at the results from the point of view of language used, in Slovak requests formulated by linguists the factors F1 (22.64%), F2 (17.30%) and F5 (16.46%) occurred most and the factors F8 (4.82%) and F9 (5.03%) least frequently. In English requests, the factors F1 (22.62%), F2 (19.98%) and F4 (15.84%) occurred most frequently and factors F7 (2.18%), F8 (2.99%) and F9 (3.33%) least frequently.

The results of cross-tabulation analysis showed (Tab. 2), that there is a difference between the language (Slovak or English) and the use of selected factors of politeness (the contingency coefficient is statistically significant (0.2434) at the level of  $p < 0.01$ ). This means that the occurrence of individual factors of politeness depends on the language used in the text of request.

It was proven (through the association rule analysis), that the factors F2, F1, F4 and F3 (support: 71.24%; 68.58%; 53.98%; 51.77%) occurred most frequently among all factors of politeness in examined requests formulations written in English.

The English requests are more direct with a politeness feature, which is a paradox. Linguists used more the *requestee's perspective* (F3 for Slovak is 5.66% and for English 15.04%), and similarly also the *politeness markers* (F4 for Slovak is 9.33% and for English 15.84%), and considerably less *pre-sequences* (F5 for Slovak is 16.46% and for English 11.34%), and *mitigating devices* (F7 for Slovak is 9.12% and for English 2.18%), which are typical features of politeness in Slovak language. The speaker uses them to "ensure" the request fulfilment, which seems to be a successful strategy to approach the requestee and his/her understanding of the request. In English, their occurrence is less frequent. We may discuss, whether the lower occurrence of these factors is due to different structure of politeness of requests, or if the requesters prefer directness to ensure that their request is comprehensible.

In terms of factor combination, the following factors were combined the most: *alerter* with *requester's perspective*, *requester's perspective* with *politeness marker* and *alerter* with *requestee's perspective* (support: 48.67%; 42.92%; 39.38%). From the point of view of pair occurrence  $F5 \Rightarrow F3$ ,  $F5 \Rightarrow F1$ ,  $F2 \Rightarrow F4$  and  $F1 \Rightarrow F3$  occurred more frequently jointly in transactions of used factors of politeness than as separate factors (lift: 1.22; 1.22; 1.12; 1.11).

In case of the couple pre-sequences  $\Rightarrow$  requestee's perspective, the association of direct factors of politeness is shown. This means that when the requester used a *pre-sequence*, he/she also used the *requestee's perspective* (to mitigate the directness of a request and its impact and effect on the requestee). The *pre-sequence* and *requestee's perspective* were associated with *alserter* (salutations and greetings) (F5 with F1) or (F3 with F1) by requesters. They reinforce the request with them, i.e. they express the respect to the introductory - opening communication structures in the specific language and will not risk the failure of supposed communicated expectations of the partner – a native speaker. The next pair was *requester's perspective* and the *politeness markers* (F2 with F4). In case of interlanguage (English), when requester used more direct utterance through factor F3, he/she mitigated this directness with expressive factor F4 (*politeness marker*). When he/she decided to express him/herself more indirectly, he/she used a combination with *politeness marker* (F2 with F4) reinforcing the likelihood of request fulfilment, which is confirmed by the last couple of factors.

The analysis results for the texts of requests written in Slovak were partially different. The most frequent factors used were: F1, F2 and F5 (support: 73.21%; 73.21%; 49.55%), contrary to English. As we mentioned before, Slovak language prefers indirect expressions with social factors of politeness that express the politeness model of requests in Slovak. Slovak language expresses the politeness through a more indirect utterance, explanation, compliments and avoiding the interruption of the image of his/her communication partner.

The most frequent factor combinations are: *alerter* with *requester's perspective* and *alerter* with *pre-sequences* (support: 52.68%; 43.30%); and  $F7 \Rightarrow F5$ ,  $F5 \Rightarrow F1$ ,  $F4 \Rightarrow F2$ ,  $F1 \Rightarrow F7$  and  $F6 \Rightarrow F1$  occur in transactions of used factors more frequently together than separately (lift: 1.25; 1.19; 1.16; 1.11; 1.02). It is particularly interesting that there are combinations of *post-*

*sequences with mitigating devices* as combinations of expressive factors with social factors and the rules of their combinations, which are typical for Slovak language.

We can say that the requests in Slovak are less direct, using more *mitigating devices* (F7 - apologies for interference), *minimizers* (F8) and *compliments* (F9).

From our point of view, there are interesting pairs of expressive and social factors of politeness, i.e. *mitigating device* combined with *pre-sequences* but also with *attention getter* in a reverse order. It means that, when a requester used an *alerter* - a form of addressing, a specific greeting etc., it is more likely that he/she used an expressive factor, which raised the indirectness of utterance and decreased its possible negative effect. Similarly, if he/she used indirect expression of perspective – F2 then he/she combined it with *politeness markers*, so the most frequently occurred association rules were those indicating the preference of indirect expression in Slovak language.

The results are interesting mainly in terms of differences in the use of politeness factors in English and Slovak language.

We consider these findings interesting, because we examined the same requests (in context) but in different languages with different L1's experience in speech acts of requesting and different L2 proficiency. Here, different patterns of request formulations are being created depending on the language used.

We used our own tool for requests preprocessing during which our self-created lists of particular factors for keywords identification were used.

Transaction/Sequence Model for text representation has proved to be suitable for short texts, because it allows us to examine the relationships among the examined attributes and search for associations among the identified keywords in texts of requests.

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