Prosodic cues of genuine and mock impoliteness in German and Polish

Bistra Andreeva[1], *Silvia Bonacchi*[2], *William Barry*[1]

[1] Computational Linguistics and Phonetics, Saarland University, Saarbrücken, Germany
[2] Institute of Specialist and Intercultural Communication, University of Warsaw, Poland

[andreeva|wbarry]@coli.uni-saarland.de, s.bonacchi@uw.edu.pl

Abstract

Banter utterances can always switch from a face-enhancing to a face-threatening or aggressive act. Little is known about the prosodic expression of genuine (derogatory) vs. mock (supportive) impoliteness in German and Polish. To determine whether the face-enhancing vs. face-threatening realizations of an utterance correlate with specific accent patterns and different prosodic cues in the speech signal, four utterances were recorded by four German and four Polish speakers (2f/2m for each language) in the two attitude conditions, derogatory vs. supportive. Acoustic analysis reveals that derogatory utterances are characterized by higher intensity and lower $f0$ variability (expressed as $f0$ standard deviation) in both languages. Polish speakers employ a wider intensity range than German speakers. German speakers produce their supportive utterances at a faster tempo. It was also found that the languages differ in the nuclear pitch-accent types used in the different conditions. The Polish speakers show a strong preference for rising accent patterns in the supportive and falling patterns in the derogatory condition. In a perception experiment, 29 German and 49 Polish subjects rated the 32 utterances recorded in their language on an uncalibrated 'degree-of-friendliness' scale. The results confirm that listeners are able to discriminate between genuine and mock impoliteness.

Index Terms: mock impoliteness, genuine impoliteness, intonation, prosody, Polish, German

1. Introduction

'Oblique communication' was the term used by Leech in Principles of Pragmatics [1] for interactions in which greater inferential effort is required (e.g. to reconstruct implication, cf. [2]) to link what is said (locution) with what is meant (illocution). From the perspective of illocutionary structure, oblique communication implies indirect speech acts in which the speaker *does* mean what he says, but also means *more* than he says [3]. Indirect speech acts contain two levels of illocution: primary illocution, namely the speaker's communicative intention, and secondary illocution, which is what can be reconstructed from the literal meaning of the utterance [3].

'Mock impoliteness' [1, 4] is a prime example of oblique communication and indirect speech acts. In contrast to 'genuine impoliteness', which may be seen as "communicative strategies designed to attack face, and thereby cause social conflict and disharmony" [5], mock impoliteness describes cases in which an offensive utterance (an insult, such as: "You bastard!", "Hey, shitface!", "You mofu!") is not spoken with

an offensive intention, but is intended to be an expression of admiration or even endearment which reinforces the speaker's relationship and his/her social ties with the addressee, i.e. his/her identity and a sense of affiliation to the group [6]. The fact that such indirect utterances are understood adequately is attributed variously to:

a) a higher than usual level of cooperation between the two people involved, i.e. as cases of 'in-group-communication' [7, 8],

b) a 'relevance-effect' also termed 'context effect' [9, 10, 11]; for evidence of the role of prosody within the relevance-effect, see [12].

It has also been shown that it is not only the context *sensu lato* which contributes considerably to the reconstruction of the intended meaning, but also the production modalities of the utterance, e. g. gesture, facial expression and voice quality. It has been shown [13, 6, 14] that the speaker's overall communicative performance enables the addressee to interpret the utterance correctly. It is not only the special relationship between speaker and addressee, but their shared knowledge of the expected production forms – gestures, facial expressions, prosody and context conditions – which are necessary for 'oblique communication' to be understood as it is *meant* and not just in terms of what is *said*.

With regard to impoliteness, there are relatively few studies that address the possible role of prosody in its manifestation.

Culpeper et al. show that, in the case of impoliteness, prosody was used at two different levels: (a) in terms of phonological choice of intonational category and (b) in terms of phonetic realisation. By using a specific nuclear contour the speaker determines the illocutionary force of the utterance; by using rising or falling accent types respectively the speaker allows the conversation to continue or blocks it; by using extreme loudness or high pitch the speaker can invade the hearer's auditory space. Another strategy to increase the distance between interlocutors is "the strategic denial of pitch concord" [4]. Culpeper also offers in [15] a discussion of prosody in impoliteness within a very particular context, analysing how British English television quiz show (*The Weakest Link*) hosts use intensity, pitch and 'dramatic' pauses to create suggestions of impoliteness.

McKinnon & Prieto investigate the role of prosody and gesture in the perception of mock and genuine impoliteness in Catalan [14]. They found that intonation contours, used in the different impoliteness condition did not occur in significantly different proportions, but there *was* a stronger tendency to use H+L* L% with genuine impoliteness. The prosodic features associated with the genuine impoliteness data were higher pitch range and higher intensity maxima. Syllable duration and

average intensity were not found to differ significantly in the two impoliteness conditions.

Based on the findings in the above-mentioned work, we can formulate the following hypotheses regarding the (prosodic) differentiation of the primary illocutionary meanings of the (syntacto-semantically identical) mock impolite and genuinely impolite utterances examined in this study.

(1) Mock impolite and genuinely impolite utterances are phonologically different: speakers use different pitch accents to distinguish the two conditions?

(2) The two conditions are differentiated phonetically by means of different pitch levels, intensity levels and/or speech rate.

Since, to our knowledge, there have been no direct comparisons of languages in this field, we also offer a preliminary null-hypothesis on inter-language differences:

(3) Languages do not differ in the way they differentiate the two conditions.

2. Materials, Subjects and Methods

Four 'offensive' remarks were recorded per language:

German:

(DE_S1) Du bist ein Arsch! (*You are an arse/ass!*)

(DE_S2) Hey, Alter, was machst du denn hier! (*Hi, you old man, what are you doing here?*)

(DE_S3) Du hast es geschafft, du Sau! (*You managed it, you swine! [lit. "you sow"]*)

(DE_S4) Ach, du hast ja sowieso immer eine Eins, Du Penner! (*You always get good marks, you tramp/bum!*)

Polish:

(PL_S1) Ale z ciebie pies na baby! (*lit. You are a dog horny for women!*)

(PL_S2) Ty draniu! (*lit. You rogue!*)

(PL_S3) Ty diable! Zniszczyłeś całą konkurencję! (*You devil, you have destroyed all your competition!*)

(PL_S4) Ale ty zaliczasz te laseczki, ty złamasie! (*You have scored all those chicks! lit: You broken tail!*)

Four native speakers of each language (2f, 2m) produced the utterances with an intended 'supportive' (mock impoliteness) and an intended 'derogatory' (genuine impoliteness) attitude. The average age of the German speakers was (women) 32, (men) 29; the Polish women averaged 34, the men 34.5 years.

The recordings were made with Praat in a quiet room of the Institute of Phonetics at the University of Saarland and at a quiet private residence in Poland. Speakers wore a head-mounted microphone (AKG C520) and their productions were digitized with an Audiobox (M-Audio Fast Track). The utterances were produced several times in reaction to situational, contextual information given by the experimenter to help the speakers put themselves in the frame of mind to make the remarks in a supportive or derogatory manner. Afterwards, each speaker listened to all her/his recordings and decided which realisation of each remark was the most successful in terms of the intended illocutionary meaning. This resulted in 32 utterances per language being selected (4 speakers x 4 utterances x 2 impoliteness conditions). These utterances were analysed acoustically and used in a perception test.

3. Perception Experiment

49 Polish (average age 20.22 years, sd 4.83) and 29 German subjects (average age 28.97 years, sd 7.37) judged the 32 utter-ances spoken in their respective language. All the subjects were native speakers without any (reported) hearing impairment. They listened to each utterance as often as they wished.

The tests were carried out on-line using the internet platform "Sosci-Survey" (https://www.soscisurvey.de/). Each individual test had a fresh randomisation of the stimuli to avoid any systematic distortion of the results. Typically, it took 10-15 minutes to complete the test. The subjects were asked to listen to the utterances and judge, on a continuous, uncalibrated scale, how "friendly" or "unfriendly" they were intended to be. Linear mixed models were calculated separately for each language. Z-transformed judgment scores were the dependent variable, stimulus and subject random factors, and impoliteness condition and speaker fixed factors.

3.1. Results: German

The statistical analysis of the data reveals a main effect for the impoliteness condition ($F_{[1, 24]} = 24.9708$, $p < 0.001$), indicating a secure ability to distinguish the supportive and derogatory intentions. The mean score for the mock impoliteness utterances is +0.45, for the genuine impoliteness utterances -0.45. However, there is a significant interaction between speaker and impoliteness condition ($F_{[1, 24]} = 4.9621$, $p < 0.01$), pointing to a difference between speakers in the degree to which the intended impoliteness could be recognized. Table 1, which shows the mean scores per speaker in both conditions, as well as the post-hoc comparison results, reveals the cause of the interaction. The subjects were unable to distinguish the intended impoliteness condition of the male speaker DE1.

Table 1: *Mean judgment scores per speaker and impoliteness condition (German)*

DE1 (m)		DE2 (m)		DE3 (f)		DE4 (f)	
+	-	+	-	+	-	+	-
-0.05	0.03	0.39	-0.37	0.47	-0.57	0.98	-0.87
n.s.		p < 0.05		p < 0.001		p < 0.001	

3.2. Results: Polish

A main effect is found for the impoliteness condition ($F_{[1, 24]} = 69.9345$, $p < 0.001$) and speaker ($F_{[3, 24]} = 7.8547$, $p < 0.001$), indicating that the different impoliteness conditions are again reliably distinguished. The average scores are +0.50 for the supportive stimuli and -0.50 for the derogatory stimuli. Table 2 shows, however, that despite clear differences in the positive and negative scores for all four speakers, the degree of positivity or negativity is different for PL2 and PL3. PL2 received extremely high scores for the supportive and minimal scores for the derogatory stimuli. The reverse is true of PL3. Auditory examination of the stimuli revealed that PL2 had produced all the utterances in the supportive condition with an auditorily noticeable smile; PL3 on the other hand, had a distinctive voice quality, which could be described as 'hard' and 'rough'.

Tabelle 2: *Mean judgment scores per speaker and impoliteness condition (Polish)*

PL1 (m)		PL2 (m)		PL3 (f)		PL4 (f)	
+	-	+	-	+	-	+	-
0.55	-0.41	0.90	-0.06	0.11	-0.83	0.43	-0.71

4. Production Analysis

4.1. Acoustic Analysis

Numerous investigations have shown that measures of fundamental frequency, intensity and speech rate can differ for positive and negative speaker attitudes [16]. Therefore the following 6 acoustic parameters were derived from the acoustic signal using Praat [17]:

a) Mean $f0$ (Hz) for the whole utterance. Pitch values were collected using the RAPT algorithm [18] implemented in the program 'get_f0' from the ESPS software package. A manual correction of the extracted pitch contours was performed in Praat. Note that identical wording in the two conditions means that any (possibly distorting) effects from consonantal pitch perturbations apply to both.

b) Pitch range (in semi-tones) of each utterance based on the interval between the highest and lowest $f0$ value.

c) Standard deviation of the fundamental frequency per utterance (Hz).

d) Mean intensity (dB) for the whole utterance.

e) Intensity range (dB) for each utterance, using the difference between the lowest and highest value.

f) Mean syllable duration (ms), calculated by dividing the utterance duration (with pauses) by the number of syllables in the utterance (speech rate).

The resulting data were analysed statistically using the JMP software [19]. Linear Mixed Models (LMM) were calculated to ascertain the effect of speaker attitude on the individual acoustic parameters. The acoustic parameters were treated as dependent variables, sentence was a random factor, impoliteness condition (mock vs. genuine) and language (German vs. Polish) and their interaction were fixed factors. When appropriate, Tukey post-hoc tests were applied. Table 3 provides means and standard deviations (in parentheses) of the prosodic features, measured in the genuine and mock impoliteness condition.

Voice pitch (mean $f0$) and pitch range (max − min $f0$) do not differ significantly across the two languages or across the two politeness categories, though there is a slight tendency for the pitch range to be greater in the supportive condition in both languages. But the $f0$ standard deviation was significantly different (F $[1, 48]$ = 4.5578, p<0.05), with a higher values observed in the supportive (mock impoliteness) condition than in the derogatory (genuine impoliteness) condition.

Table 3: *Means and (standard deviations) of the prosodic features. (* = signif. across conditions)*

	prosodic feature	genuine impoliteness	mock impoliteness
G E R M A N	mean $f0$ (Hz)	161.69 (41.49)	163.88 (49.59)
	$f0$ range (s.t.)	10.84 (3.67)	12.32 (4.27)
	$f0$ standard dev.(Hz)*	31.48 (12.54)	44.17 (28.68)
	mean intensity (dB)	59.99 (2.85)	61.22 (2.34)
	intensity range (dB)*	32.91 (4.10)	30.23 (4.86)
	mean syll. dur. (ms)*	253.19 (53.31)	220.12 (51.67)
P O L I S H	mean $f0$ (Hz)	192.75 (37.82)	183.69 (35.04)
	$f0$ range (s.t.)	12.76 (2.29)	13.52 (3.95)
	$f0$ standard dev.(Hz)*	36.65 (11.16)	40.02 (14.59)
	mean intensity (dB)*	78.22 (1.89)	73.66 (2.58)
	intensity range (dB)*	37.39 (5.32)	33.23 (9.06)
	mean syll. dur. (ms)	205.99 (46.21)	211.70 (48.93)

There is a main effect of language and impoliteness condition on mean intensity. The Polish group speaks significantly louder than the German group (F $[1, 7.747]$ = 187.8872, p<0.001), and the utterances produced in the derogatory condition are significantly louder than those in the supportive condition (F $[1, 48]$ = 10.0823, p<0.01). However, a significant interaction is found between language and impoliteness condition (F $[1, 48]$ = 30.5170, p<0.001). The Polish speakers are 4.56 dB louder in the derogatory than in the supportive condition, while the German speakers are equally loud in both conditions. On the other hand, *both* speaker groups use a greater *range* of intensity in the derogatory condition (F $[1, 48]$ = 6.8626, p<0.05).

Statistically, there is a significant effect of impoliteness condition on speech rate (F $[1, 48]$ = 7.2210, p<0.01) and an interaction between impoliteness condition and language F $[1, 48]$ = 14.5068, p<0.001). The German group speaks at a faster rate in the supportive condition – the average syllable duration is 33.07 ms shorter – while the Polish group has comparable rates in both conditions (see table 3).

4.2. Nuclear Tone Accents

In an auditory analysis, the nuclear pitch accent of each utterance was labelled according to ToBI conventions (G-ToBI for the German data [cf. 20, 21] and an adapted ToBI version for the Polish data).

4.2.1. Nuclear Pitch Accents in German

The following pitch accents were identified in the German data: H*, L*, H+L*, L+H*, H+!H* (see table 4). It can be seen in table 4 that both the high/rising accents and the low/falling accents are more or less equally distributed over the positive and negative conditions. There are 11 high/rising accents in each – 10 H* und 1 L+H* in the supportive and 7 H* und 4 L+H* in the derogatory condition – and 5 low/falling accents in each – 1 L*, 2 H+!H* und 2 H+L* in the supportive and 1 L*, 3 H+!H* und 1 H+L* in the derogatory condition.

Table 4: *Nuclear pitch accents per speaker, and condition for the German data (+signifies mock, – signifies genuine impoliteness).*

speaker	DE1 (m)		DE2 (m)		DE3 (f)		DE4 (f)	
attitude	+	-	+	-	+	-	+	-
H*	2	2	1	2	4	2	3	1
L+H*			1	2		1		1
L*			1					1
H+!H*	1	2				1	1	
H+L*	1		1					1

Furthermore, auditory analysis showed, in the case of sentence 2, that although both male and female speakers produce high/rising accents, the female speakers employ differing *tonicity* to differentiate between attitudes, i.e. by placing the nuclear accent on '*du*' in the supportive condition and on '*Arsch*' in the derogatory condition. This is not the case with the male speakers. In fact, speaker DE1 uses the same pitch accent and placement for both conditions in sentences 1, 2 and 3 (which presumably contributes to the difficulty subjects in the perception test had in distinguishing his genuine and mock impolite utterances; see section 3).

4.2.2. Nuclear Pitch Accents in Polish

The nuclear pitch accents used by the Polish speakers are: H*, ^H*, !H*, L+H*, L+!H*, H+!H* und L* (see table 5). In contrast to the German H* pitch accent, the Polish H* is characterized by a pitch peak which is typically reached early in the syllable, producing a falling pitch over the syllable. Note that the pitch-modified H* pitch accents (upstep ^H* and downstep !H*) are explicitly included in the inventory. The accents with a peak can be divided into two groups: falling: those with an early peak (H*, !H*, ^H*, H+!H*) and rising: those with a late peak (L+H*, L+!H*). Examination of the table shows that, in contrast to the German speakers, the Polish speakers modify their intonation systematically with intended impoliteness condition. They have a clear preference for late peaks (a rising contour) in the supportive condition (10 late: 4 L+H*, 6 L+!H* vs. 4 early: 3 !H*, 1 H+!H*) and early peaks (a falling contour) in the derogatory condition (15 early: 5H*, 5 ^H*, 5 H+!H*). Only *one* speaker (PL3) produced *one* late peak accent (L+H*) in this condition, and *one* speaker (PL1) produced 2 L* in the positive condition. But the overall pitch contour still rises, from the L* nuclear syllable to a high boundary tone (L* H-%).

Table 5. *Nuclear pitch accents per speaker, and condition for the Polish data.*

speaker	PL1 (m)		PL2 (m)		PL3 (f)		PL4 (f)	
attitude	+	-	+	-	+	-	+	-
H*		1		1		1		2
^H*		1		2		1		1
!H*			1		1		1	
H+!H*		2		1		1	1	1
L+H*			2		2	1		
L+!H*	2		1		1		2	
L*	2							

5. Discussion and Conclusions

The study reported here has uncovered different phonetic profiles for the production of supportive compared to derogatory utterances in German and Polish. The results confirm the thesis that a successful indirect speech act of the type 'mock impoliteness', i.e. the recognition by the hearer of a supportive intention despite the use of derogatory locution, depends on more than contextual factors and the adequate reconstruction of implicatures. It depends also on "performative" factors, on the "how" of phonetic production. After confirming with a perception experiment that the utterances of the mock-impolite and genuine-impolite conditions could, in many cases, be reliably distinguished, a selection of prosodic properties mooted to be potentially relevant to the success of the speech act, were examined.

The results of the production analysis showed that speakers participating in such speech acts have recourse to a combination of phonetic-prosodic parameters and categorical intonation features which they exploit to varying degrees. With regard to the hypotheses formulated in section 1, the results can be summarized as follows:

(1) Mock impolite and genuinely impolite utterances can indeed be phonologically different: speakers can use different pitch accents to distinguish the two conditions? For Polish, in 14 of the 16 pairs of utterances (4 pairs per speaker) a different nuclear pitch accent was found in the supportive vs. derogatory condition (a rising pitch for supportive, falling for derogatory). However, no speaker used the same pitch accent difference each time. For German, however, no systematic *tonality* differentiation was found, although the two female speakers used a nuclear *placement* (tonicity) difference in one sentence.

(2) The two conditions *are* differentiated *phonetically* as well. All three of the dimensions mooted in the hypothesis (pitch, intensity and speech rate) are used, but not in a straightforward manner. The only *pitch* parameter which distinguishes the conditions is pitch *variation* (measured by standard deviation across the utterance), and this applies to both languages. Intensity range is also used by the speakers of both languages to distinguish mock- from genuine-impoliteness, and mean intensity is used by the Polish but not the German speakers. Speech rate, on the other hand is used by the German but not the Polish speakers.

(3) The null-hypothesis that languages do not differ in the way they distinguish the two conditions can clearly not be upheld. The data available on Catalan (cf. [14]) provide further evidence. They show a systematic use of mean pitch which was not found for Polish or German.

The results show that in the production of recognizable mock impoliteness vs. genuine impoliteness a selection is made from a bundle of phonological and phonetic prosodic properties comprising pitch accent, *f0*, intensity, speech rate, voice quality, and possibly others. But other, segmentally definable properties such as glottal stops and laughs, or non-phonetic gestures such as smiling can also be exploited.

The results also show considerable inter-speaker variability, however, so more speakers need to be analysed before a core selection of properties can be identified.

What *is* apparent is that the perlocutionary effect, i.e. the recognition of the intended mock vs. genuine impoliteness, depends critically not only on the selection but also on the *weighting* of the properties. In both languages it was observed that if the speaker did not use the relevant phonetic and intonational properties to the correct degree, the two impoliteness condition would not be distinguished. For example, speaker DE1 *does* use the acoustic properties found for the two impoliteness conditions in section 4.1. (higher *f0* standard deviation for the supportive condition and higher intensity range and lower speech rate for the derogatory condition), but the difference between the two is too slight to trigger recognition (at least in the random presentation mode used). Nor did the listeners have recourse to compensating features such as voice quality, laughs or smiling that [14] and [29] maintain can be crucial to correct recognition.

In summary, we can confirm that the systematic use of prosody *can* serve to signal the supportive vs. the derogatory use of impolite expressions by itself, though gestural support is normal in real communicative situations. There appear to be inter-language differences, but the small number of speakers studied here prevents confidence in the details of this claim.

6. Acknowledgements

7. References

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