Dafydd Gibbon & Małgorzata Kul

Economy Strategies in Restricted Communication Channels. A study of Polish short text messages

Abstract
Das Protokoll des Kurznachrichtendienstes (Short Message Service, SMS) für Mobiltelefoniekanäle ist inzwischen ein beliebtes Medium für persönliche und berufliche Sofortnachrichten zwischen gleichberechtigten Kommunikationsteilnehmern. Der restringierte Funktionalstil der Textnachrichten hat mit seinen auffälligen Kodierungskonventionen die Aufmerksamkeit von Linguisten, Lehrern und Medienspezialisten geweckt.

SMS-Texte werden oft negativ als Abweichung von normalen schriftsprachlichen Standards angesehen; doch fehlen genauere deskriptiv-linguistische Untersuchungen vor allem von Ökonomiestrategien in der Produktion und –rezeption von SMS-Nachrichten und von Kodierungsdifferenzen aufgrund typologischer Sprachunterschiede. Diesen Anforderungen kommen wir mit unserer Analyse polnischer SMS-Nachrichten nach. Im Unterschied zu einem großen Teil der bisherigen Literatur zu diesem Thema geht die Analyse eher strukturell als diskursanalytisch oder soziolinguistisch vor und bietet einen empirisch unterstützten Theorierahmen für die Behandlung von Ökonomiestrategien.

Introduction

Since the advent of wireless telephony technologies, the Short Message Service (SMS) protocol for mobile telephony channels has become a highly popular medium for instant peer-to-peer distance communication, whether for business or for personal contacts. The restricted register of text messages (texts, SMSs) has also become a part of the linguistic landscape, with highly conspicuous coding conventions which have attracted the attention of linguists, teachers and media specialists. In popular media and educational contexts, text messages are often considered to be a deviation from written language standards, and are pejoratively judged, but they also merit attention from linguists because of the light they can throw on strategies of language production and perception, and on the dependence of these on the typological properties of different languages.

The considerable quantity of studies of SMS texts and related messaging in English is primarily discourse-oriented (Segerstad 2002, Bergs 2003, Thurlow 2003). Studies of the structural linguistic properties of text messages started more recently and remain rather modest in number (cf. Lopez Rua 2006, Kul 2007a, 2007b).

In view of the limitations of the medium, the immense and rapid world-wide rise in popularity of the Short Message Service came initially as a surprise to many service providers and equipment manufacturers, as well as to specialists in the humanities, but the technical service providers soon extended the SMS messaging protocol to MMS (Multimedia Messaging Service), for transmitting audio, photo and video files via mobile telephony channels.

The present study concentrates on the text message component of these services, and examines the cognitive principles underlying the specific formulations which are characteristic of text messages. The central principles are identified as *economy strategies*, and the results of a study of Polish text messages are reported. The paper makes two main contributions: first, in providing a theoretical framework and empirical support for the concept of economy strategy, and, second, in increasing the number of languages treated in text message research.

The structure of the paper reflects these contributions. The first two sections are concerned with laying the foundations in respect of economy strategies, the third and fourth address empirical issues, while the final section draws conclusions and sketches the outlook for future research. In the first section, the properties of text messages and their contexts of use are reviewed, introducing the concept *economy strategy*. The second section characterises economy strategies in terms of *language-external factors* (higher-level principles and channel constraints), and *language-internal factors* (typological differences in graphotactic, phonological, morphological and syntactic structure). The third section contributes a study of economy strategies in Polish, in which relevant features of the typology of Polish are outlined, and the frequency and distribution of economy strategies are compared cross-linguistically and discussed in terms of language internal constraints. In the fourth section, text messages are located within the conceptual space of spoken and written modalities of communication, and the hybrid intermodal status of SMS texts is demonstrated. The fifth and final section proposes further research strategies, specifically underlining the need for sociological studies of text message users, which would contribute to the understanding the impact of economy strategies in language use and language change in different contexts.

Characterisation of economy strategies

Channel constraints

Text messages operate on a protocol which permits a maximum of 160 characters per message, including spaces between words. Messages can be linked automatically if longer, but pricing is proportionate to the number of

messages, yielding an additional financial constraint on message length. The input device is a small numeric keypad with multiple assignment of characters to keys, and the output device is a small screen (sizes vary between the low end and the high end of the market). These channel constraints on text messages are summarised in Figure 1. In comparison with more traditional texts, writing and reading on a mobile phone are both severely hampered by the medium. The constraints apply to mobile phone based SMS text messaging; there are computer-based SMS text messaging methods for which at least the input/output constraints are a little less severe, for example via a PDA, a website, or word-completion tools, but the channel protocol constraints still remain, and indeed these additional methods may even increase the ergonomic problems. A detailed overview of the technical protocol and history of SMS text messaging is provided by Wikipedia (2008).

Text messages are not alone in being subject to channel constraints. Taking face-to-face communication between average human interlocutors as a convenient point of reference, any variation of communication conditions will introduce its own constraints. Such variations of communication conditions include personal impediments of speech and hearing as well as teleglossic (distance) communication: change of medium from speech to writing, use of technical media such as telegraphy or telephony, teleglossic speech surrogates such as whistling and drumming, bell-ringing, bugle calls, stamping, clapping and finger snipping. Like text messaging, many of these other channels encourage brevity of communication and use of special techniques such as abbreviations and special codes.

Unlike some of these other kinds of restricted register, the small size of the tactile-visual input-output devices in mobile phones lends text messaging the ethically relevant interpersonal property of *apparent privacy*, which is no doubt one of the contributory factors to the popularity of the medium. The privacy property is not absolute, as messages are in principle accessible to the service provider and to third parties, either via interception during transmission by police services or the service provider, or by loss or theft of the device.

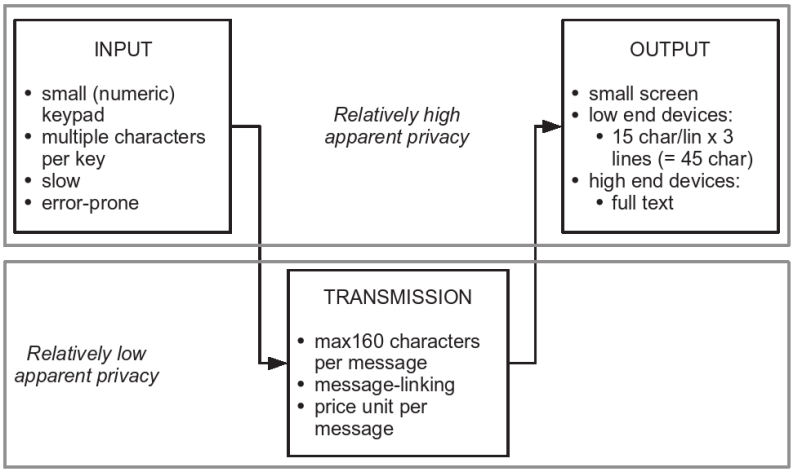

Figure 1: Summary of channel constraints on SMS messages.

Formulation properties

Text messages display characteristic linguistic properties of numerous types, such as

1. a shorthand manner of writing, e.g. *r father in hvn: up 2 d8 txts frm d bible*;
2. metaphonological devices such as character homophony, e.g. *c u l8r? nikki." Mark: "c all of me l8r;-).*

In the literature, these formulation devices are referred to informally as "abbreviations", "consonant writing" and "contractions" (Papen & Tusting 2006, Thurlow 2003, Segerstad 2002), or as "shortening devices". They include clippings, phonetic respellings, capitalisations, letter homophones and number homophones (Lopez Rua 2006).

Previous studies have concentrated on informally classifying (and sometimes pejoratively judging) these formulation devices, but have not addressed the cognitive language processing principles underlying their use in any coherent or comprehensive way. The present study seeks to fill this gap in two ways: first, with an new and explicit notion of *channel constraint*; second, by introducing a cover term *economy strategy* to denote *the variety of productive devices motivated by a need to economise on time, space and cost*, whereby cost may be understood variously as *work*, *effort*, *price*, or in other ways. Economy strategies can be classified according to three kinds of criterion: metaphonology, phonology, and channel constraints.

Metaphonology-motivated strategies (Kul 2007a), also used in language play in paragrams or paronomasia (e.g. punning), employ a homophony effect. They are

based on the metaphonological proficiency of the texter, i.e. proficiency in recognising and manipulating the phonological structures of the language. Metaphononology motivated strategies are of many types:

1. acronyms and initialisations, e.g. *atb* "all the best", *bbfn* "bye bye for now", *bbl* "I will be back later", *cmi* "call me", *hand* "have a nice day", *pls* "please", *thnq* "thank you", *tnx* "thanks";
2. number-word homophony, e.g. *2* "to", "too", *4* "for", *8* "ate";
3. ABC language/letter homophony, e.g. *b* for "be", *c* for "see", *m* for "am", *n* for "an/and", *o* for "oh" as in "Oh, I see!", *r* for "are", *t* for "tea", *u* for "you", *y* for "why", and commonly used combinations: *ur* for "you are", *cu* for "see you";
4. blending of different strategies, e.g. *2nite* "tonight", *2moro* "tomorrow", *3dom* "freedom", *4ever* "forever", *4tun* "fortune", *m8* "mate", *gr8* "great", *w8* "wait", *l8* "late".

Phonology-motivated strategies (Kul 2007b) are similar to the reduction processes used in fast and informal speech styles:

1. letter omission, e.g. *hvn* for "heaven", clipping, e.g. *bro* "brother";
2. phonetic simplification and homophonous spellings, e.g. *nu* "new", *yaself* "yourself", *nite* "night", *coz* or *cuz* "because".

Channel-motivated strategies are imposed by technical limitations of the visual display channel, as shown in the following examples from the Polish corpus:

1. omission of punctuation, e.g. *Jakby drzwi od klatki byly zamkniete to pusc strzalke bo nie mamy domofonu*;
2. use of lower case characters instead of upper case in proper names, e.g. *Po 17 na rondzie przybyszewskiego* (should be spelt Rondzie Przybyszewskiego as it is a place name; the initial capitalisation of *Po* is automatic);
3. omission of spaces between words and concomitant use of capitals to mark word beginnings, e.g. *Hey!CouMnie?zDominikemGodzimySie*;
4. emoticons, e.g. *:p*, *:D*, *:(*, *:)*, rarely with the "nose" hyphen used in other media, e.g. *:-pI*, *:-D*, *:-(*, *:-)*, and sometimes rendered as icons such as ☺, (smiley, frowny, etc.);
5. onomatopoeic expressions and interjections, e.g. *ehhh*, *buhaha*, *blabla*, *auuu*, *hehe*, *hihi*, *aaaa*, *ups*, *grr*, replacement of the diacritics with the ASCII characters, e.g. *sie* for *się*.

Explanation of economy strategies: Natural Linguistics

Economy, effectiveness and Least Effort

Language is held to have many functions in the organisation of thought and in communication. Effectiveness in the transfer of information is one of these. In the communication domain, for instance in a conversation, it was already noted

in the early days of modern phonetics that there is little time to finish an utterance, that delivery should be performed as quickly and as effectively as possible, and that this has consequences for the actual speech uttered (Sweet 1891 [1960], Passy 1890). Effectiveness has many connotations, but in text messages, the key concept is the *economy strategy*, which will be characterised in more detail below. The economy strategies in text messages are subject to the one main function of communicating in an economical manner. Consequently, in the present study a functional theory of language has been selected in order to provide a functional theoretical framework for explaining economy strategies: Natural Linguistics (Dziubalska-Kołaczyk 2002b).

Natural Linguistics has developed an explanatory system which stipulates that behavioural preferences are governed by higher cognitive principles which manifest themselves in ways specific to particular languages (Table 1). One such higher principle is the *Principle of Least Effort*. It is intuitively almost self-explanatory since the idea behind the principle is simple: "Minimise effort!" Human beings are taken to be governed in their choices and behaviour by a universal tendency to reduce effort. Zipf (1949 [1972]) explained the tendency as follows: "Each individual will adopt a course of action that will involve the expenditure of the probably least average of his work (by definition, least effort)" (Zipf 1949 [1972]: 543).

Exercising least effort can, of course, have a deleterious effect on perception and understanding, and a complementary Principle of Clarity is also required in order to counterbalance the overuse of the Principle of Least Effort, as will be seen in discussing letter reduction in Polish consonant clusters.

In Natural Linguistics, the Principle of Least Effort, a higher, universal principle, predicts that in phonology, for example, devoicing of final obstruents is preferred to non-devoicing (a linguistic preference). German and Polish language users devoice obstruents in word final position, whereas, language-specifically, users of English do not, at least at the phonological level and in formal citation environments.

Table 1: Explanatory levels in Natural Linguistics (modified from Dziubalska-Kołaczyk 2002b:104).

Explanatory Factor	*Domain*
Higher Principles (Principle of Least Effort, Principle of Cognitive Economy, Principle of Perceptual Ease)	Non-linguistic: cognitive, physiological, psychological, sociological, ...
Preferences (In pronounceability and perceptibility: preferences for CV syllable structures, simple phonotactics.)	Linguistic: structural, functional and semiotic
Consequences of Preferences (Absence of clusters in a language, final devoicing, assimilation, epenthesis, ...)	Linguistic: structural typology of languages

Other explanations of economy strategies

There are appraisive, or, more specifically, pejorative and judgmental pre-scriptive views that economy strategies are a cause (or, depending on moral stance, a result) of deterioration in writing standards (Sutherland 2002, Bralczyk 2004); such views we refer to as *Deterioration Theory*.

Economy strategies are also explained as in terms of the ludic functions of language: as a playful means of free expression, a way to "experiment creatively with a new style" (North 2006: 210). For instance, the following explanation in terms of *affordances* was developed in relation to the impact of new tech-nologies. The concept of affordances refers to the way in which human beings, animals can use the possibilities of actions offered by an environment/ object. Affordances refer to the material characteristics of the environment/ object and can be used in both negative and positive way: revolving door in a building afford access for the visitors (positive), but limit the access to toddlers or wheelchair users (negative) (North 2006). We refer to this approach as *Affordance Theory*.

In similar vein, the devices used for the new technologies facilitate communication and at the same time, "generate creative new literary practices.
For instance, text messagers use a variety of non-standard linguistic forms, such as contractions, abbreviations, phonetic spellings and emoticons" (Papen & Tusting 2006: 322-323). We refer to this approach as *Creativity Theory*.

The three theories outlined above, Deterioration theory, Affordance Theory and Creativity Theory, have in common that they classify SMS communication in terms of deviation from standard types of communication, conditioned by the introduction of new technologies (Kress 2003, Papen & Tusting 2006). This family of theories can thus be referred to as Deviation Theories.

The present approach offers an alternative to these accounts of text message communication by introducing the more generally applicable concepts of Constraint and Economy Strategy, and the cognitive principles on which they is based, and by indicating how the SMS medium relates to other communication media in this respect. The Principle of Least Effort explains economy strategies as a tendency to reduce effort, and is a substantive alternative to the existing DeviationTheories. Unlike Deterioration Theory, it avoids labeling economy strategies as 'good' or 'bad' and remains non-judgmental. Affordance Theory and Creativity Theory take SMS coding strategies to be productive and new; they are indeed productive, but they are not new. These strategies have been used in many previously developed styles and registers and for a variety of purposes, such as shorthand stenography, telegraphy, telegrams, short-wave radio communication, headlines, and internet chat, and were possibly originally introduced into SMS messages by users of these older media.

Perhaps the most well-known historical example is the French exchange between Frederick II ("the Great") of Prussia and Voltaire in the 18th century, in which the message *Venez souper à Sans Souci* (come to dine at Sans Souci palace) was expressed with paragrams in the form of paronomastic icons by *"venez" sous "p"* ("come" under "p") and *"cent" (100) sous "6"* ("hundred" under "6"), whereupon Voltaire replied *Ga*, *"g grand, a petit"* (big "g", small "a"), decoded as *j'ai grand appetit* (I am very hungry), being simultaneously the initials of the words *grand appetit*:

Frederick II:	*p* *venez*	*à*	*6* *100*
Voltaire:	*Ga*		

The coding techniques (with the exception of two-dimensionality of *sous*) are those of modern SMS messages. The techniques (though with "fun" and "secrecy" rather than "least effort" interpretations) can be traced at least as far back as kabbalistic interpretations of the Hebrew scriptures. The techniques clearly represent a particular kind of goal-oriented skill in handling channel constraints, not any kind of deterioration of language, and the practitioners are evidently not backward schoolkids.

The Channel Constraint Principle

In characterising and explaining economy strategies, the Principle of Least Effort has been identified as a language-external cognitive factor. A related language-external factor is the Channel Constraint Principle. Gibbon (1981, 1985) analysed channel constraints imposed by Morse Code telegraphy on the restricted register of short-wave radio communication, using the methodology of Speech Act Theory, and focusing on uptake-securing. In telegraphy, which dates back about 150 years, and in short-wave radio communication and teletype communication, which date back about 100 years, similar constraints and coding strategies to those outlined for SMS communication can be observed:

1. *cq* "seek you" (cf. the internet service *ICQ* "I seek you"), *vy* "very", *pse* "please", *tnx* "thanks", *hi* "laughter", *dx* "distance", *tx* "transmitter", *rx* "receiver";
2. numerical military telegram phrase-list codifications, such as *73* "best wishes", *88* "love and kisses";
3. domain-specific encodings with a *q-* prefix (used in short-wave amateur radio), such as *qrg* "frequency", *qrm* "interference", *qam* "weather forecast".

SMS messaging is a variety of teletyping, and its coding strategies link seamlessly to those used in traditional teletyping. The coding strategies can therefore not, in themselves, be regarded as a form of deterioration, since they were developed earlier for well-defined channel-constrained technical communication registers. The strategies are simply channel-constrained economy strategies. PDAs and other small devices, as well as keyboard devices used by non-fluent typists (i.e. most PC users) also encourage the use of economy strategies, as in emails and internet chat. Formulations using the same strategies are often calqued in other kinds of communication; for example, SMS-type jargon is used, whether for fun or other reasons, in headlines, mass advertising and brand names (cf. *YZ* chewing gum, with an owl logo: *wise head*), or in children's autograph albums: *yyuryyubicuryy4me*, *Too wise you are, too wise you be, I see you are too wise for me*.

In summary, the Channel Constraint Principle is one of the communication environments which trigger the application of the higher level Principle of Least

Effort. It applies to many restricted technical communication registers and is not restricted to a particular jargon developed and used by children and adolescents, as implied in a number of previous studies.

Other languages

Both the Principle of Least Effort and The Channel Constraint Principle have been seen as determinants of economy strategies in communication which are limited and governed in their distribution and frequency by language-internal factors such as phonology, phonotactics, morphology and graphotactic properties of orthography.

In terms of linguistic forms, economy strategies are not absolutely universal in the strict sense, and the influence of typological differences between languages becomes particularly visible in comparison of economy strategies across languages. In a crosslinguistic study of economy strategies in English, Spanish and French, preferences for particular strategies have been compared (Lopez Rua 2006). The study concludes that English users favor initialisations, letter and number homophones, phonetic respellings and letter reductions. Spanish exhibits strong preference for letter reductions and letter homophones, whereas in French phonetic respellings, number and letter homophones were the most frequently employed. Both French and Spanish, unlike English, avoid initialisations. The author of the study concludes that "each language tends to favor particular devices on the grounds of variety of factors such as the origins of the language, the complexity of the inflectional system, the correspondences between spelling and pronunciation, or even phonotactic constraints" (Lopez Rua 2006: 139).

Detailed explanations for these differences are not provided, however. Theoretically, the differences need not be due to typological differences, of course, but could be due in principle to conventions which happen to have developed in particular speaker communities. In order to distinguish the conventional from language-specific or indeed universal factors, more analyses of specific languages are needed.

Economy strategies in Polish

Background to the description of Polish SMS texts

As a step towards remedying the situation that all languages except a few are underdescribed in respect of SMS texts, the present study investigates economy strategies in text messages in Polish, a language which is typologically different from all the above-mentioned languages in orthography, phonology, morphology and syntax, in order to cross-check the results of previous studies, and in

order to move towards more detailed explanations and to give particular attention to the linguistic description of coding features which result from economy strategies.

The literature on text messages in Polish is relatively abundant. Texting has received considerable attention since its inception. In particular, the sociological and discourse aspects of texting have been extensively covered (Karwatowska & Szpyra-Kozłowska 2003, Bralczyk 2004, Kuźmiński 2004, Wolańska 2004, Malinowska 2004), while the linguistic properties of text messages have received little attention (but cf. Kul 2007a, 2007b).

The research question in the present study is to establish whether the Polish language employs any economy strategies in text messages and to determine what the extent is. As far as the corpus of text messages is concerned, the resources of the internet nowadays offer commercial databases of text messages which can be purchased and used on numerous occasions. Inspection of such databases reveals that these ready-made text messages are conventional, highly artificial, and are either jokes or of the type "I love you, you love me, oh baby, can't you see" and fail to provide any insight into SMS-specific coding. The following examples illustrate the type of text messages offered by commercial databases:

Falszu unikaj, nie znaj zazdrosci, nie kochaj tego, kto nie wart milosci, serca nikomu nie oddaj w ofierze, a gdy pokochasz, to kochaj szczerze [Be honest, not jealous, don't love people who are not worth it, but when you love somebody, give all your love].

Grupa malp uciekla wczoraj z ZOO, najsmieszniejsze to to, ze jedna trzyma ten telefon! [A group of monkeys escaped from the Zoo yesterday. One of the monkeys is holding this mobile phone!]

DUREX informuje, że Twoje narodziny były wynikiem wady fabrycznej. Prosimy szybko zgłosić się do szpitala celem uspienia. Dziekujemy [DUREX informs you that your birth resulted from a structural defect of our products. You are kindly requested to visit the nearest hospital in order to be put down. Thank you].
Source: http://serwissms.pl/index.php?kat=1

Method

A small corpus of Polish text messages was gathered in January 2006. The corpus contains 292 samples, of which 72 were obtained from friends and the remaining 220 messages were supplied by first year Polish students of English

and of Russian. The students were asked to retrieve ten text messages, both sent and received, from their mobile phones. Precautions were taken to ensure that the study deals with genuine material: the subjects were instructed that special care must be taken in order to preserve the original spelling, spaces and omissions as well as non-verbal signs such as emoticons.

The corpus was then analysed and samples classified with reference to the economy strategies which have already been identified, with attention to the possibility that new strategies might be found.

Classification of economy strategies in Polish

In the Polish text message corpus described here, the following coding techniques have been identified as economy strategies:

1. Omission of punctuation:
   a) *Ojciec powiada ze nie na zadnego na zbyciu bezpiecznika. Jesli to sa wykrecane mozna zastapic tanio go zwyklym bez switcha ale najlepiej nowe nabyc*
      [father says that he has no spare fuse. If they are the screw-in ones, you can replace them with the ordinary ones without the switch at a low cost, but the best thing to do is to buy a new one]
   b) *Dobranoc kochanie ja czytam ksiazke od ciebie i popijam piwko zaraz pora spac bo tez jestem zmeczony a jutro chcialbym duzo zrobic caluski kochanie papapapa*
      [good night, darling, I am reading the book from you and sipping beer, soon I am going to sleep]
   c) *Jakby drzwi od klatki byly zamkniete to pusc strzalke bo nie mamy domofonu.*
      [if the door to the building is locked, give me a call because we have no intercom]
2. The use of lower case for upper case characters in proper names:
   a) *Po 17 na rondzie przybyszewskiego*
      [hey! how I have been doing? we are reconciling with Dominik]
   b) *Ja koncze 18.45 na zamkowej to czekaj na mnie absoluta mozemy potem isc na ten koncert na matejki w jakims pubie*
      [I am finishing at 18.45 at Zamkowa Street, so wait for me then we can go for the concert on Matejki Street in a pub]
   c) *Gdzie dostales ladefogeda?*
      [where did you get the Ladefoged's book from?]
   d) *prostopadla do garbar*
      [perpendicular to Garbary Street]
   e) *Czekolada jest blizej solnej.*
      "Chocolate" is closer to Solna Street

3. The lack of spaces between words and the use of capitals to mark word beginnings:
   a) *Hey!CouMnie?zDominikemGodzimySie(tymRazemOnZerwalBoNiePosluchalamGoIspalamUkolagiAleInnejMozliwosciNieMialamBoZalezaloMiByGdzisPojscINieZdazylamNaAutobusWzgDoKlenicy)jeszczeNiePracujeNaStaleIjestemWMCHOD.ZaadamemTesknieJakbymGoSzalenieMocnoKochalaAleNadalJestemKonsekwentnaWmilczeniu @.@pa*
   [how I have been doing?we are reconciling with Dominik because I haven't taken his advice and slept at my friend's house but this was the only possibility because I had no other place to go, I missed my bus to Klenica, I am not employed permanently yet, I am in CHOD. I am missing Adam a lot as if I was madly in love with him but I keep consistently silent]
   b) *OstatniaSeriaPytanAkapityMajaBycNa2cm?JakSiePiszeRosyjskiSkrotOdNumerICzyToJestNapewnoTakZeWBibilografiiOsobnoPolakRuskiAWPracyWgDat?*
   [the last series of questions. Are the paragraphs supposed to be 2 cm wide? How do you spell the Russian abbreviation for number? Are you sure that in the bibliography you make separate entries for the Polish and the Russian ones, whereas in the paper they are sorted by dates?]
4. Emoticons: :p, :D, :(, :), ☺
5. Onomatopoeic expressions and interjections: *ehhh, buhaha, blabla, auuu, hehe, hihi, aaaa, ups, grr.*
6. Replacement of Polish characters with diacritics by ASCII characters: *coz* "cóż / well", *palic* "palić / to smoke", *w ciagu* "w ciągu / during", *sie "*się / itself", *spoznie* "spóźnię / I'll be late", *zaplaca* "zapłacą / they will pay".
7. Borrowings: *h "*godzina / hour", *asap "*najszybciej jak można / as soon as possible", *gut news "*dobre wiadomości", *happy new year "*szczęśliwego Nowego Roku", *see you* "do zobaczenia", *nxt "*następna", *4 all "*dla wszystkich", *sat "*sobota", *sun "*niedziela", *bany (German) "*pociągi / trains", *new "*nowy".
8. Number homophones: *3maj sie, 3m sie "*trzymaj się / take care".
9. Letter homophones: *s, ska "*eska / text message" ("s" for "sms" with diminutive suffix *-ka*).
10. Letter reduction. Example: *pzdr "*pozdrowienia / kind regards", *kwrtlnch "*kwartalnych / quarterly"
11. Phonetic respelling of borrowings. Examples: *lawju "*kocham cię / I love you", *fak* "Kurwa! / Fuck! (literally: whore, prostitute)", *gut najt "*dobranoc / good night", *spicz "*wystąpienie / speech", *slit drims "*słodkich snów / sweet dreams (with Polish "ł" simplified to "l").
12. Clippings: *rach tel "*rachunek telefoniczny / phone bill", *min "*minuta / minute", *inf "*informacja / information", *dot "*dotyczący / regarding",

*pozdro, pozdr "*pozdrowienia / greetings", *cze "*cześć / hello, goodbye", *mam nadz "*mam nadzieję / I hope", *b "*bardzo / very", *spr "*sprawdzić / to check", "sprawdzian / test", *kom* "komórka / mobile phone", *syg "*sygnał / phone signal", *godz "*godzina / hour", *cz "*czy / if", *ew "*ewentualnie / "or", *rozm "*rozmowa / talk", *dop "*dopiero / at least", *max "*maksymalnie / maximum" , *narka "*na razie / bye", *sorki "*przepraszam / I'm sorry, excuse me", *powt "*powtarzać / repeat), *st "*stopień / degree", *trza "*trzeba / one needs to", *psych "*psychicznie / mentally, *fiz "*fizycznie / physically", *mo "*mocno / strongly", *do zob "*do zobaczenia / see you", *zal "*zaliczenie / credit", *dzieks "*dziekuj / thank you", *mikra "*mikroekonomia / microeconomics", *impra "*impreza / party", *odp* "odpowiedz / reply", *komp "*komputer / computer", *nr "*numer / number", *str "*strona / page", *pasi "*pasuje / suits", *bibl "*bibliografia / references", *art "*artykuł / article", *net "*internet / the internet", *zadzw "*zadzwonić / to call", *po powr "*po powrocie / on coming back", *wiad "*wiadomość / message", *spozn "*spóźnić się / to get late", *dyska "*dyskoteka / disco", *pusc mi "*puść mi strzałkę / send me a signal (send me a one-ring call)", *pozost "*pozostawilismy / we left", *najlep* "najlepiej / the best", *zaj "*zajęcia / classes", *wcz "*wczoraj / yesterday", *czyt "*czytalismy / we read", *rob "*robiliśmy / we did", *zad "*zadanie / assignment", *poz "*Poznań", *wro "*Wrocław", *swi "*Świdnica", *szcz "*Szczecin", *mchod "*Międzychód" (the last four are place-names). Some of the clippings are widely used in standard contexts in Polish: *min*, *godz*, *odp*, *nr*.

13. Others: *pa "*na razie, do widzenia, do zobaczenia, dobranoc, etc. / bye" (the usual casual speech "Goodbye!"), *p'n'p "*Piotr i Paweł / Peter and Paul (a local supermarket chain)".

From classification to constraint

In comparison to English, economy strategies in the Polish corpus appear to be infrequent. The first four strategies are present in Polish text messages to a considerable extent, and their extensive use may be due the fact that they are characteristic of Roman orthographies in general, and not specific orthographic properties of a given language. Independently of their frequency, the techniques discovered in the corpus may be generalised into constraints in the spirit of declarative theories in linguistics, and in particular Optimality Theory. The constraints are not an absolute "must": they are tendencies, and therefore more closely related to the Preference Theory of Natural Linguistics than to Optimality Theory. To emphasise these similarities, the constraints are formulated in a similar fashion: NoPunc, NoCaps, NoSpace, NoDia, the functional Iconicity constraint and the ShortLoan constraint.

1. Punctuation
    1. NoPunc Constraint. Use of punctuation marks is infrequent and occurres mostly in very short messages: omission of punctuation allows economisation of characters in a highly circumscribed environment. Moreover, it has similarities to informal, running speech.
    2. NoCaps Constraint. The use of lower case instead of upper case characters in proper names affords writing convenience. The change from capital to small letters requires an additional operation which disturbs fluent keying and prolongs the writing process.
    3. NoSpace Constraint. The combination of omission of spaces between words and the use of capitals to mark word beginnings is motivated by economy since spaces between words are also charged by the mobile phone operators, and extra space is available for writing. The capital letters has a demarcative function and indicates where a word begins.
    4. NoDia Constraint. ASCII characters are preferred to Polish letters with diacricits.
2. Iconicity Constraint. Emoticons are combinations of alphanumeric and punctuation marks, generally representing facial expressions more or less iconically. They are widely used, and some of them have become so standardised (e.g. smilies ":-)" and frownies ":-(" that they are effectively universal (in this domain) and create the means to express feelings and attitudes in an economical way. The same can be claimed for onomatopoeic expressions.
3. ShortLoan Constraint. Use a shorter familiar loan word, if available, in preference to a longer Polish word.

The constraints are not simply an unordered list: they are ranked in terms of an *Other Things Being Equal* type of default-override relation. For example, the Principle of Perceptual Clarity may be infringed by any of these constraints, but ultimately carries the day: the NoPunc Constraint and its special case, the NoSpace Constraint, may lead to ambiguities and difficulty in parsing. In these cases, overriding of the NoCaps Constraint, though infringing the Principle of Least Effort, rescues the Principle of Perceptual Clarity.

The systematicity of this constraint system demonstrates that the restricted SMS register is not based on random creativity but is driven by a highly structured model.

Novelties in Polish coding strategies

Polish SMS encoding has two novelties in comparison with English text messages. First, strict ASCII characters are used for Polish characters with diacritics; English has no characters with diacritics. Second, abbreviatory

borrowings from other languages are used; English is very abstinent in this respect, though the use of text messages by language minorities in English speaking countries might show differences.

First, *strict ASCII* (American Standard Code for Information Interchange) consists of the decimal numbers 0-127, i.e. 128 numerical codes (2^8, thus 8 bits per character) . The numbers encode the upper and lower case characters of the English alphabet, numerals 0-9, punctuation marks and teletype and screen control codes such as bell, line feed, carriage return, form (page) feed, cursor movement up, down, left, right. The ASCII code has been extended over time in several ways, and strict ASCII now forms a subset of Unicode, the universal character encoding system, which is also gradually entering into the mobile phone domain. In the Polish corpus, not one text message used Polish characters with diacritics. This strategy has a number of reasons:

1. Certain models of mobile phones fail to display Polish characters. Consequently, the characters are replaced by the € symbol or Greek letters. ASCII incompatibility results in a "window effect", comparable to the one witnessed in computers text, e.g. *sie* "się / itself". It is possible to retrieve the character from the context, but it takes time and therefore infringes the as well as the Principle of Clarity, i.e. a Principle of Least Effort on the part of the reader.
2. Another reason for replacement of Polish characters is lack of practice and training. Keys are associated with multiple characters, and to reach a Polish character four or five key presses may be required. It requires a high degree of precision to spot the right symbol or to automatise the number of key presses. Obtaining the Polish characters by means of skipping the previous characters on the same key presents no problems in principle for teenagers (who still avoid them), but is frequently reported to be difficult by adults.
3. There are no lexical competitors of words such as *sie* 'się', *bedzie* 'będzie' or *sa* 'są', therefore ambiguity does not arise in these cases.
4. The ASCII inventory is smaller than the Polish character inventory, aiding memorisation of key press patterns.

Second, the innovative feature of *borrowings* represents a different economy factor: in general the loan words are shorter than the corresponding Polish words, and therefore also afford the possibility to economise on space and time. The subjects of the study have a decent or good command of English, therefore they use English words and expressions when they judge that the English word is shorter than the Polish one. No case was observed in which the borrowed word was longer than the Polish equivalent. Replacing longer expressions with

the shorter borrowed ones constitutes a separate and novel category of economy devices for non-English text messages.

A third feature, *letter and number homophones*, appears to be fairly sparsely represented in Polish text messages. This could be mainly a matter of chance, and not simply a function of English having a large number of monosyllabic words. The fact that Polish text messages frequently employ the *3maj sie* example means that Polish users would use letter and number homophones if it had them at their disposal. Moreover, the texters made use of the single coincidence that the *s* letter reads like the beginning of SMS and in spoken Polish, *eska* (*es* for the letter "s" with diminutive suffix *-ka*) is more economical (shorter) than *esemes* or, more officially, *wiadomość tekstowa.* As far as letter reduction is concerned, there was only one example of *pzdr*. This lack of vowel elisions could be a function of the large number of consonant character clusters in Polish. The high frequency of this particular reduced item ensures good familiarity and presents no problems with decoding.

A fourth feature, *letter reduction* can be in general be explained by means of the semiotic principle of "figure and ground" (Dressler 1996). The principle "predicts that figures tend to be foregrounded, grounds to be further back-grounded" (Dressler 1996: 42). In this context, consonants can be compared to figures and vowels to grounds. In speech, consonants are more likely to be preserved, whereas vowels are likely to be reduced or deleted in fast or highly informal speech. The "rich-gets-richer" principle developed by Donegan (1978/ 1985) specifies the precise conditions for Dressler's (1996) figure and ground principle. Donegan argues that in certain contexts figures which appear in strong positions are strengthened, whereas grounds which appear in weak positions are weakened. As a result, in speech consonants in weak positions are deleted (i.e. word finally), and in strong ones are preserved (i.e. word initially or initially in stressed syllables).

Analogously, English vowels in unstressed position may undergo reduction, for example to schwa. Polish text messages, however, fail to demonstrate letter reductions. The Polish language, unlike English, is highly inflectional, which results in longer words. Inflected words in Polish are, however, are not prone to reduction. If the vowels were deleted, the information about the case, gender and singularity/plurality could be lost, e.g. *sama* reduced to *sm* could be misinterpreted as *samo, same, sami* and so on. The Principle of Perceptual Clarity is therefore supported by the inflexional system as a second factor, after consonant clusters, which can bar Polish words from undergoing letter (vowel) reduction.

The fifth feature of *phonetic re-spelling* is rare, because Polish orthography has a near one-to-one correspondence between graphs and phonemes. The only counter-examples are special cases of respellings in which the English lexical items are phonetically represented with the Polish characters.

The sixth feature, *clippings*, yielded the unexpected result that clipping is in fact the most productive economy strategy in Polish SMS messages. Many of the clippings are already well established in Polish (*ew, str, st).* The remaining clippings, however, such as *mo "*mocno / strongly", *do zob "*do zobaczenia / see you",), *cze "*cześć / hello", *mam nadz "*mam nadzieję / I hope", *zadzw "*zadzwonić / to call", *po powr "*po powrocie / on coming back", *wiad "*wiadomość / message" or *spozn "*spóźnić się / to be late" demonstrate that this economy strategy spreads on to words used in text messages for arranging meetings and fixed phrases. The phrase *pusc mi "*puść mi strzałkę / send me a signal" is an extreme case of clipping. A separate category can be established for frequently used place names such as *poz "*Poznań", *wro "*Wrocław", whose familiarity and high occurrence (among local people) justifies clipping. This particular economy strategy seems to be the most productive strategy of all, but the method of clipping is also extremely systematic. Polish has a high number of polisyllabic words (due to inflectional and derivational endings) which tend to be reduced to the first syllable, whereby the resulting clipped form is frequently still uniquely identifiable in context, so that only a minimum of semantic keyword disambiguation is needed.

As for other economy strategies, there is one case of a fixed phrase *pa* which has been established as the umbrella term for *goodbye* on the grounds that it is already the shortest way of saying "Goodbye!" in spoken Polish. There is also an example of initialisation: *p'n'p* 'Piotr i Paweł' (a local chain of super-markets). The name of the supermarket is very well known to the Poznań inhabitants, which explains initialisation.

Summary of Polish economy strategies

Polish morphology and graphotactics limit the use of economy strategies, in spite of the fact that Polish texters are subject to the same channel constraints as English texters. It therefore appears that language typology, as opposed to users' convention, also plays a decisive part in constraining the selection of economy strategies. On the one hand, the presence of inflectional endings limits letter reduction, whereas the existence of polysyllabic words, on the other, affords clippings. Clippings tend to occur in nouns in the corpus (*Wro* for *Wroclaw*), whereas clippings in verbs were less frequent, perhaps because of inflectional constraints.

Summing up the discussion of the results, *prima facie* one would expect morphology (a highly complex inflectional system and consequently poly-syllabic words) to encourage economy strategies, but apparently the risk of morphosyntactic ambiguity limits letter reduction in general, and clipping in verbs. It also appears that complex clusters of consonant characters may be a further inhibitor for vowel elision, since this would yield even more complex consonant character clusters. Thus, orthography (nearly 100 per cent one-to-one correspondence between graphemes and phonemes) also governs the distribution and frequency of economy strategies in Polish.

Further perspectives

Text messages and the spoken-written channel parameter

Text messages are a written medium, but certain characteristics are shared with spoken language. Economy strategies in text can be seen as a "visual lenition", comparable with lenition processes in running speech, since letter omissions, clipping, phonetic respellings etc. are rather similar to reduction processes in spontaneous speech. We refer to this as the *Visual Lenition Principle*. Moreover, text messages possess numerous characteristics of dialogue such as relatively short contributions and invitations for immediate response. The extensive use of the Visual Lenition Principle, the presence of features characteristic of spoken dialogue, as well as the fact that texting frequently approximates to spoken dialogue in its real time properties (e.g. in appointment scheduling, meeting arrangements, joking, flirting) substantiate the hypothesis that text messages are a hybrid of spoken and written modes (Frehner 2008).

New lines of research

Language is a social phenomenon and cannot be analyzed in isolation from its users. Having considered the formal properties of the restricted register of text messages such as language internal and external factors, as well as having established texting as a hybrid between the spoken and written language, it is clear that there is still a sociolinguistic knowledge gap in the study of economy strategies: Who uses these strategies exactly, and under what circumstances are they generalised by some pupils, for instance, to less constrained forms of writing such as school essays?

Many researchers claim that texts and economy strategies are predominantly used by young people. Unfortunately, there is lack of studies that could establish a sociological profile of text message users and their strategies. Information such as socio-economic and education levels, family background, literacy and access to various registers in various media would help to create a solid basis for research on economy strategies. Sociological data would also shed some light

on the speculations about the future development of economy strategies. Suffice it to analyze the following example of a generalisation of texting to other registers of written language:

My smmer hols wr CWOT. B4, we usd 2go2 NY 2C my bro, his GF&thr 3 :-@ kds FTF. ILNY, it's a gr8 plc
[Translation: My summer holidays were a complete waste of time. Before, we used to go to New York to see my brother, his girlfriend and their three screaming kids face to face. I love New York, it's a great place].
(North 2006: 209)

Surprisingly, the quotation was not retrieved from a private exchange. The above quotation is an excerpt from an essay submitted by a 13-year-old pupil to a teacher in Scotland. The essay, written in the language of text messages, illustrates the way in which the more familiar texting may influence the other writing habits of young people, though too little is known about the background of the young people concerned. Familiarity may thus be the first factor in this generalisation process.

The 2002 report prepared by the Scottish Qualification Authority on Standard Grade examinations revealed that students used the language of text messages during written exams in English. There is no denying that the economy strategies used in SMSes are entering standard English. The fact that the written mode in question is highly influenced by the spoken one (the Visual Lenition Principle) might reinforce a tendency for the simplified spelling to spill over into writing habits. But, as already noted, the economy strategies as such are nothing new, even in recent popular culture: it is not only 'genres' such as telegraphy and telegrams which have used such strategies for 100-150 years, but headlines, hiphop lyrics, brand names and advertising have also used them for some time.

The explanations may be offered for this generalisation of SMS strategies to other domains of writing. First, it may simply be a further application of the Principle of Least Effort: "Let's get it over with!" Second, for many young people, texting may be the predominant mode of writing, and therefore highly familiar, encouraging its use in other contexts.

The third factor that can be identified here is not so much the genesis of texts as their reception by adults. It is noteworthy that exactly the same economy strategies in older media were initiated by adults. The text messaging context may well be the first time that children and adolescents have introduced channel-driven economy strategies spontaneously, prompted by the Channel Constraint Principle and the Principle of Least Effort. It may be queried whether

the same judgmental attitudes to text message jargon would have appeared if text messages were used purely by mature adults; there can be no doubt that the jargon would have arisen in any case, as precidents in radio communication and telegraphy show.

Further legitimate questions can be posed as to whether economy strategies will proliferate, to what extent the proliferation will occur and in what social environments it might be one of the very few available registers. These questions may be partly answered with sociological information: it can be speculated that the strategies are only one of the registers at the disposal of the more highly educated children, who would consequently not be so tempted to use text message jargon in other contexts, while for less educated children would possibly know text jargon practically as their only use of written language.

Finally, the results achieved in the present study apply to languages with Roman orthographies. The more complex strategies used, for instance, by Arabic, Chinese and Hindi SMS messages, involve phonetic or iconic ASCII mappings or the use of Unicode fonts, and constitute a separate issue.

Conclusions

The study has introduced a set of explanatory concepts, deriving ultimately from Natural Linguistics, to explain the linguistic properties of the restricted register of SMS text coding jargon: the Principle of Least Effort, the Channel Constraint Principle, and the Principle of Clarity. In addition, a set of specific coding strategies for Polish, which are dependent on the typology of Polish graphotactics and morphosyntax was presented.

As technology advances, it can be expected as a matter of course that the channel constraints on SMS text encoding will change, and with them the frequency and distribution of economy strategies, perhaps especially the number homophony strategies in view of the introduction of tiny but full keyboards. And indeed mobile phone technologies have advanced since the data for the present study were collected: models with larger screens and tiny typewriter-like key arrangements have been available for a number of years, and the latter can have advantages over the traditional telephone keypad, (depending on finger size). Word-completion functions (also used in word-processors) may be helpful under some circumstances. A study on word-completion was not carried out, but an informal survey shows that for word-completion functions tend to be seen as too ‘gadgety’ and can result in less rather than greater economy, because they can be contraproductive: they may slow down text entry and increase the error rate due to rejection of or failure to reject unwanted completions and due to the need to switch the function on and off, and because they lengthen messages and may

thus lead to increased expense, contrary to the economy strategies discussed in the present study.

The evidence available justifies the following main conclusions:

1. Economy strategies are motivated by language-external factors (the *Principle of Least Effort* and the *Channel Constraint Principle*), but their distribution and frequency are governed by language-internal typological factors (morphology and orthography).
2. Text messages are by no means random, but are governed by a very regular constraint model, within which the economy strategy constraints may be overridden by the *Perceptual Clarity Principle* where parsing becomes difficult or ambiguity occurs.
3. The constraints which govern text messages are not signs of deterioration in the use of language but determine a particular goal-directed skill which is used in many other types of communication to achieve goals of economy, secrecy or amusement.
4. Text messages (like internet chat) belong to a third genre on the spoken-written continuum since they exhibit the properties of both, justifying the formulation of the Visual Lenition Principle.

Incorporation of sociological studies could be of great help in answering questions related to the further development of the strategies.

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