Games on Multiword Expressions for Community Building

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ABSTRACT: In this paper we present games focusing on multiword expressions (MWEs) – word combinations that exhibit unexpected lexical, syntactic, semantic, pragmatic and/or statistical properties. These games were based on a multilingual collection of MWEs contributed by the members of a scientific network specialized in natural language processing. We describe the data collection process and their exploitation for a cross-lingual alignment game of MWEs with common meanings, a pantomime and quizzes based on idioms referring to nationalities. With these games the linguistic variety and richness of the PARSEME action members were leveraged in order to increase the networking effect.
KEYWORDS: multiword expressions, idioms, games, lexical resources.

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1 Introduction and motivation

Learning through play is a renowned principle in education, as a means of effective development of social, cognitive and emotional skills, mainly in children. In scientific research the so-called serious games and games with a purpose, often based on data crowdsourcing, can be used to turn user's entertainment into a profit for a particular research task. In this paper we address the use of games on the periphery of scientific research: in community building. We report on efforts put to organize games for the COST action PARSEME,[1] which is a European scientific network in the domain

[1] PARSEME – PARSing and Multi-word Expressions, www.parseme.eu

of Natural Language Processing (NLP). It is dedicated to investigating interactions between parsing (automatic syntactic and/or semantic analysis of natural language utterances) and multiword expressions (MWEs). MWEs are word combinations which exhibit unexpected lexical, syntactic, semantic, pragmatic and/or statistical properties. Prominent examples of MWEs are idioms, such as *by and large*, *a hot dog*, or *to pull one's leg*. Their most pervasive feature is their semantic non-compositionality, i.e. the fact that their meaning cannot be calculated from the meanings of their component words in a straightforward way. This fact makes MWEs challenging both for human non-native speakers and for NLP applications such as machine translation or information extraction. But we show that it can also be exploited for its amusing and surprising effect.

The PARSEME network, running from 2013 to 2017, gathered over 200 researchers from over 30 countries, working on as many languages. For its culminating event, which took place in September 2016 in Dubrovnik, Croatia,[2] multilingual examples of MWEs were collected from the participants and turned into quizzes. The underlying idea was to leverage the tremendous linguistic variety and richness of the network members, so as to achieve conviviality and increase the networking effect. As a side effect, the multilingual dataset of several hundreds of MWEs was created and is freely available.

2 State of the art

Games with a purpose (GWAPs) emerged in 2004 with the ESP image tagging game (Von Ahn and Dabbish, 2008) approximately at the same time as crowdsourcing began to be used (Howe, 2006). Actually, these two new ways of performing serious tasks have a lot in common: tasks that are still challenging for computers but are trivial (or manageable) for humans are being divided into small sub-tasks and distributed among many "workers", that need not be specialists, to solve them. The difference between these two approaches to exploit the human brain-power lays in the way people are motivated to perform these small, usually tedious and labor-intensive, sub-tasks: in the case of crowdsourcing the motivation can be the financial gain, desire to learn something or wish to contribute to some common cause, while in the case of GWAPs the main motivation is to entertain oneself. The need to entertain human "workers/players" certainly affects the way sub-task work has to be organized and to what type of tasks games are right solutions.

[2] The events page

Since the emergence of these two concepts voices were heard that reconsider these types of work organization. Besides the quality of the work done in this way, its ethics was also questioned. For crowdsourcing the question emerged: "Can we foresee crowd workplace in which we would want our children to participate?" (Kittur et al., 2013), while Tuite (2014) states that "Games that aim to provide only entertainment in exchange for work risk seeming exploitative, even if that was not the designer's intention." The same author advocates that players of a GWAP should know in advance the purpose of a game and contribute to its fulfillment of their own free will – the "entertainment" will help in doing it. Moreover, she also claims that besides doing tedious and uninteresting tasks in a human-processing unit (HPU) scenario, games should be designed for skilled professionals to perform complex and creative work, as has been already done, for instance, in the protein folding game Foldit (Cooper et al., 2010).

Crowdsourcing was successfully used in many Natural Language Processing (NLP) projects (Mitrović, 2013), especially for language resource development, and particularly for less-resourced languages for which speakers can be more easily motivated to contribute (Millour and Fort, 2017). Crowdsourcing, games with a purpose and other collective intelligence-based approaches can be used not only for building new resources for NLP, but already developed NLP resources and tools can be used to evaluate collectively built resources (Gurevych and Zesch, 2013).

In (Lafourcade et al., 2015) authors divide GWAPs into four broad categories: biological games, games with a medical purpose, GWAPs for NLP and unclassifiable games. They emphasize that GWAPs are particularly important for language resource development as they not only enable the acquisition of huge resources, but they can take into account the dynamic and evolving aspects of languages. Also, the resulting resources may incorporate those data acquired by several players on which they reached a consensus – this ascertains their soundness, something that cannot be easily obtained with traditional data acquisition. According to the inventory presented in (Lafourcade et al., 2015) most GWAPs for NLP are used for annotation tasks (anaphora relationships, coreferences, syntactic annotation, semantic disambiguation, etc.) and acquisition tasks (common sense facts, paraphrases, associations between terms and their characteristics, named entities, etc.), but also for building new resources (lexical network of terms) and validation (associations between concepts). Recent developments include no-

tably a game in MWE annotation in French.[3] Finally, there are many other word or letter games that are similar to GWAPs but do not fall completely into that category (lack of consensus, no validation of players' answers, etc.).

Games that we will present in this paper are specific in their nature. They are no full-fledged games, but were rather invented for the specific purpose of community building, and aimed to be played only once. More precisely, their main goal was to close a successful research network project in good spirits. Their side-effect achievements, besides the acquisition of resources (a multilingual inventory of MWEs), included raising the awareness of the MWE phenomenon (appropriate for a large public), and revealing stereotypes related to different nationalities which show in the idiomatic use of language.

3 Collecting the data

The input data for the games were contributed by a specific community of experts rather than via crowdsourcing. Namely, the PARSEME members were asked to fill in an online form with MWEs preferably in their mother tongues. Each MWE was to appear in the original script, transliterated to Latin script if needed, and both its literal and its idiomatic meaning were to be provided. The form consisted of 3 sections:

- highly opaque MWEs, i.e. those whose meaning is particularly hard to figure out for foreigners, as in example (1),[4]
- MWEs referring to nationalities, especially those based on positive or negative stereotypes, as in example (2),
- MWEs with general meanings, i.e. those having one of the 10 pre-selected senses: TO DIE, TO BE TIRED, TO BE STUPID, TO BE ANGRY OR IN BAD TEMPER, TO BE/FALL IN LOVE, TO DO SOMETHING USELESS, TO BE DRUNK OR FOND OF DRINKING, TO PAY ATTENTION TO UNIMPORTANT DETAILS, TO WORK HARD, TO BE LAZY; two collected examples are shown in (3)–(4).

(1) немати длаке на језику (SR) – nemati dlake na jeziku
'*to have no hair on one's tongue*' ⇒ TO EXPRESS ONE'S OPINION OPENLY

[3] https://zombilingo.org/login

[4] Henceforth, examples will be tagged with the languages they stem from. See p. 22 for the list of language codes.

(2) saoul comme un polonais (FR)
'*as drunk as a Pole*' ⇒ VERY DRUNK
(3) pójść do Abrahama na piwo (PL)
'*to go have a beer with Abraham*' ⇒ TO DIE
(4) nach dem Bettzipfel schielen (DE)
'*to squint at the corner of one's bed*' ⇒ TO BE TIRED

In this way we collected, in total, 455 MWEs from 38 contributors in 25 languages. These data were used as input for the three games presented below.[5]

4 Games on general meanings

These games were based on input data provided by users about multiword expressions for ten general senses. The idea was to choose from the users' input the most opaque examples and give them to players to guess their meaning. At the same time we wanted that all languages for which users provided the input be represented in the game. In order to give players the multiword expressions that they have never heard of, and under the assumption that close languages (languages from same families) are more likely to share the same (or similar) multiword expressions, we grouped all the collected input data into four groups: Slavic languages, Romance languages, Germanic languages and other. For instance, for the meaning TO DIE 27 MWEs were collected: 10 for Slavic languages (Bulgarian, Croatian, Macedonian, Polish, Russian and Serbian), 7 for Romance (Brazilian Portuguese, French, Portuguese, Romanian and Spanish), 4 for Germanic (Danish, English, German and Norwegian), and 10 for other languages (Greek, Hebrew, Hungarian, Lithuanian, Latvian, Maltese, Farsi and Swahili).

The players were grouped into four groups according to their mother tongue. Each group was given 12 examples chosen from the three other groups; that is, no group was presented with an example in a language that was a mother tongue of some group member. The players' task was to associate each given example with one of 4 predefined meanings (there were 3 examples for each meaning). Each example was presented with the following information: languages it comes from, the MWE in the original script, the MWE transcribed (if Latin script was not used), literal translation. For

[5] All examples are cited in this paper as they were collected. No efforts were put into homogenising them or checking their meaning with independent experts.

instance, the Romance group obtained the following three examples for the meaning TO BE IN LOVE; TO FALL IN LOVE:

(5) poczuć do kogoś miętę (PL)
'*to feel mint for someone*'
(6) Schmetterlinge im Bauch haben (DE)
'*to have butterflies in one's stomach*'
(7) belécsap a villám (HU)
'*the lightning hits him*'

Some of the 10 general meanings for which there were more opaque examples in various languages in input data were given as options to more than one group: TO BE ANGRY, TO BE DRUNK, TO BE USELESS, TO BE TIRED, TO DIE, TO BE STUPID.

As a complete sample of this game, we cite the dataset given to the Slavic group. It consisted of examples (8–19) to be assigned to meanings a)–d). The solution to this sample is given in Appendix 1.

Meanings:

a) TO DIE (TO BE DEAD)
b) TO BE TIRED
c) TO BE STUPID
d) TO BE ANGRY

Expressions:

(8) estar criando malvas (ES)
'*to be growing mallows*'
(9) estar na capa da gaita (PT)
'*to be in the accordeon's case*'
(10) lóg a bele (HU),
'*his intestines are hanging*'
(11) πάω στα θυμαράκια (EL) – pao sta thimarakia
'*to go to the little thyme bushes*'
(12) qabżitlu ċ-ċinga (MT)
'*his strap got out of its place*'
(13) passer l'arme à gauche (FR)
'*to put the weapon on the left side*'
(14) har roterende fis i kasketten (DA)
'*has a rotating fart in his cap*'

(15) **בקלמר מחודד הכי העפרון לא** (HE) – lo ha-iparon haki mexudad ba-kalmar,
'*not the sharpest pencil in the case*'

(16) βγαίνω από τα ρούχα μου (EL) – vjaino apo ta rucha mu
'*take-off of the clothes my*'

(17) nincs ki a négy kereke (HU)
'*he does not have all the four wheels*'

(18) estar de saco cheio (PT)
'*to have one's bag full*'

(19) كَردَن كَف كَسي دَهَن (FA) – dahāné kasy kaf kardan
'*mouth someone's to foam*'

At the "Multiword games" session of the 7th Parseme general meeting all participants (except organizers) were divided into four groups and they worked together to find the solutions. There were between 8 and 13 participants in each group. The time was limited to 15 minutes. All groups performed extremely well: the Germanic group solved all 12 problems, the Romance group solved 10, the Other languages group 9, and the Slavic group 8.

The games for all four groups as well as the spreadsheet with all users' input for 10 senses can be found at the event's page.[6]

5 MWE-based pantomime

For this game we used only English MWEs so that everybody could participate, presuming that everybody in the audience knew English. Most of English MWE examples were selected from famous seminal papers on MWEs (Baldwin and Kim, 2010; Sag et al., 2002), which all PARSEME COST action participants must have read. A few other were chosen either as being generally known, e.g. *all of a sudden*, or as being mentioned many times during PARSEME meetings, e.g. *it rains cats and dogs*. All chosen MWEs were ranked as being easy, medium or difficult according to two criteria: (i) is the MWE well known? (ii) is it easy to demonstrate in a pantomime game (e.g. adverbs are harder to demonstrate than nominal or verbal MWEs)?

English native speakers did not participate in this game; they instead had the role of referees. The audience was divided into two groups. Each group received a set of English MWEs: 4 easy, 4 medium and 1 difficult

[6] Games are available online.

MWE. One person of a group showed the MWE by pantomime, while the rest of the group guessed. Guessing time was limited to 1, 2 and 3 minutes for the easy, medium and hard MWEs, respectively. The demonstrator was allowed to point by fingers the number of constituents the MWE consisted of, otherwise she/he could use all non-verbal means of communication to try to explain what a particular constituent was.

As an example, MWEs of one group were:

- Easy MWEs (1 minute):
  1. *pain in the neck* A SOURCE OF ANNOYANCE, A NUISANCE;
  2. *take the bull by the horns* TO CONFRONT A PROBLEM HEAD-ON AND DEAL WITH IT OPENLY;
  3. *spill the beans* TO GIVE AWAY A SECRET OR A SURPRISE;
  4. *strike while the iron is hot* WHEN YOU HAVE AN OPPORTUNITY TO DO SOMETHING, DO IT BEFORE YOU LOSE YOUR CHANCE.
- Medium MWEs (2 minutes):
  5. *cranberry word* – in linguistic terminology, a cranberry morpheme (or fossilized term) is a type of bound morpheme that occurs only in MWEs and cannot be assigned an independent meaning or grammatical function, as in *to go astray*;
  6. *red tape* THE COLLECTION OR SEQUENCE OF FORMS AND PROCEDURES REQUIRED TO GAIN BUREAUCRATIC APPROVAL FOR SOMETHING, ESPECIALLY WHEN OPPRESSIVELY COMPLEX AND TIME-CONSUMING;
  7. *sell like hot cakes* TO BE SOLD VERY FAST;
  8. *trip the light fantastic* TO DANCE, IN PARTICULAR ENGAGE IN BALLROOM DANCING.
- Difficult MWE (3 minutes):
  9. *by and large* ON THE WHOLE, EVERYTHING CONSIDERED

At the end, all MWEs were guessed by the audience although we have to admit that referees were not very strict over the time spent. However, one MWE was guessed before the demonstration even started. It was enough that the demonstrator said "It is an MWE that everybody knows" and the solution was offered immediately: *kick the bucket* TO DIE.

The MWEs to guess for both groups can be found at the event's page.[7]

[7] Available online.

6 Quiz with nationalities

As mentioned in Section 3, part of the collected MWEs refer to nationalities and mostly convey positive or negative stereotypes about them. We gathered 80 such expressions from 23 countries about 32 various nationalities or groups of nationalities in total. These data were then manually transformed into a graph-based representation, overlying a political map of Europe, so that an arc goes from country A to country B if the language spoken in A uses an MWE referring to the nationality of B. This representation oversimplifies the country-to-nationality correspondence but is an acceptable approximation for our aim. The color of each arc depends on the polarity of the stereotype expressed by the MWE:

- red: negative stereotype,
- orange: neutral,
- green: positive stereotype.[8]

For instance, as shown in Fig. 1, a red arc going from Latvia to Sweden represents expression (20), an orange arc from Greece to France stands for (21), and a green arc from Malta to the UK corresponds to (22). The arrows are larger or narrower, depending on the number of the MWEs having the same source and target countries, as well as polarity.

(20) zviedru gardīnes (LV)
'*Swedish curtains*' ⇒ PRISON

(21) γαλλικό κλειδί (EL) – jaliko klidi
'*French key*' ⇒ ADJUSTABLE WRENCH

(22) għandu ħin Ingliż (MT)
'*to have an English timing*' ⇒ TO BE PUNCTUAL

This representation facilitated the analysis of the data set. For instance, we had expected a large number of MWEs to concern neighboring countries, due to historical reasons. Such expressions were however not very frequent in our data set – see examples (23)–(28) and Figure 2.

(23) leben wie Gott in Frankreich (DE)
'*live like God in France*' ⇒ TO LIVE IN LUXURY

[8] Colors cannot be seen in the printed version of this paper, but are visible in the on-line version.

Figure 1. Graph-based representation of the MWEs from examples (20)–(22) referring to nationalities and their polarities.

Figure 2. MWEs from examples (23)–(28) concerning neighboring countries.

(24) tótágast áll (HU)
'*it stands as a Slovakian hanger*' ⇒ IT IS UPSIDE DOWN

(25) бугарски чорапи (MK) – bugarski chorapi
'*bulgarian socks*' ⇒ BEARFOOT

(26) солунски дирeци (MK) – solunski direci
'*Thessaloniki pillars*' ⇒ FAT (USUALLY FEMALE) LEGS

(27) svenskemetoden (NO)
'*the Swedish method*' ⇒ AN EASY SOLUTION

(28) czeski film (PL)
'*Czech film*' ⇒ A SITUATION IN WHICH NO ONE UNDERSTANDS ANYTHING

Another interesting phenomenon is the one of minimal non-empty cycles, i.e. a situation where several, usually two, countries use negative-polarity MWEs about each other. We found two instances of such cycles, shown in examples (29)–(32) and Figure 3.

(29) filer à l'anglaise (FR)
'*to leave in the English style*' ⇒ TO LEAVE WITHOUT SAYING GOODBYE

(30) to take a French leave (EN)
TO LEAVE WITHOUT SAYING GOODBYE

(31) saoul comme un polonais (FR)
'*as drunk as a Pole*' ⇒ VERY DRUNK

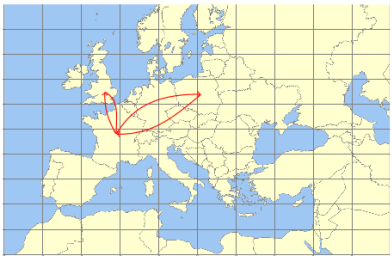

Figure 3. MWEs from examples (29)–(32), conveying reciprocal negative stereotypes.

Figure 4. MWEs from examples (23)–(28) using antonymy to express sarcasm.

(32) francuski piesek (PL)
'*a French doggy*' ⇒ SOMEONE CAPRICIOUS AND DIFFICULT TO PLEASE

As far as linguistic phenomena exploited in the stereotype-driven MWEs are concerned, antonymy was attested as expression of sarcasm. The relevant examples (33)–(35) are illustrated in Figure 4.

(33) наивна к'о француска собарица (SR) – naivna k'o francuska sobarica
'*as naïve/inexperienced as a French maid*' ⇒ VERY EXPERIENCED BUT BEHAVING AS IF IT WAS THE OPPOSITE

(34) cald nemțesc (RO)
'*German warmth*' ⇒ COLD

(35) a merge drept ca neamțul (RO)
'*to walk as straight as a German*' ⇒ TO STAGGER LIKE A DRUNK MAN

A phenomenon similar to those exploited in the game on general meanings was also observed in the MWEs with nationalities: the same meaning was expressed in different languages by referring to different nationalities, as in examples (29)-(30). Two popular meanings of this kind were TO PRETEND NOT TO UNDERSTAND and TO BE DRUNK/TO DRINK A LOT. They were represented in our data by 4 and 3 different nationalities, respectively, as shown in examples (36)–(39), (31), (40)–(42) and Figures 5–6.[9]

[9] Note that when a source or a target country is outside Europe, e.g. China in example (36), the arrow has its starting or ending point outside the map.

(36) κάνω τον Κινέζο (EL) – kano ton Kinezo
'*to make the Chinese*'
(37) udać Greka (PL)
'*to pretend being a Greek*'
(38) hacerse el sueco (ES)
'*to act like a Swedish*'
(39) правити се Енглез (SR) – praviti se Englez
'*to pretend being an Englishman*'
PRETEND NOT TO UNDERSTAND
(40) pít jako Dán (CZ)
'*to drink like a Danish*'
(41) пие како Рус (MK) – pie kako Rus
'*to drink like a Russian*'
(42) пиян като казак (BG) – piyan kato kazak
'*as drunk as a Cossack*'
TO BE DRINK/TO DRINK A LOT

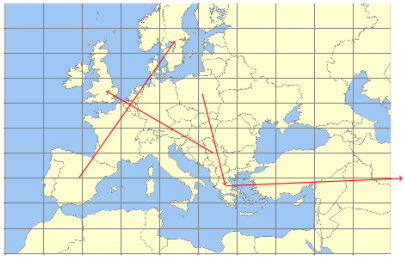

Figure 5. MWEs from examples (36)–(39) expressing the meaning TO PRETEND NOT TO UNDERSTAND.

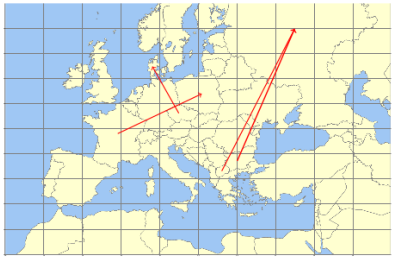

Figure 6. MWEs from examples (31) and (40)–(42), expressing the meaning TO BE DRUNK/TO DRINK A LOT with different nationalities.

Certain MWEs expressed stereotypes concerning not only selected nationalities but larger populations. Notable examples stem from Swahili and concern the white people — cf. examples (43)–(44).

(43) Mzungu wa reli (SW)
'*the railway white person*' ⇒ IGNORANT

(44) Mzungu wa unga (SW)
'*white man of flour*' ⇒ DRUG DEALER

Some results of the data analysis were offered to the audience as simple quiz questions. For instance, three European countries gathered ex aequo the highest number of the incoming edges, and the audience was to guess which countries were concerned. A similar quiz concerned the country targeted by MWEs from several languages of a given geo-political region, namely the Balkans. The examples relevant to both quizzes and the respective graphs are shown in Appendix 2.

The graph representing all collected MWEs referring to nationalities is shown in Figure 7. Out of the total number of 80 MWEs it represents, only 7 refer to positive stereotypes, 3 are neutral and the remaining 70 expressions convey negative stereotypes. The whole dataset is freely available.

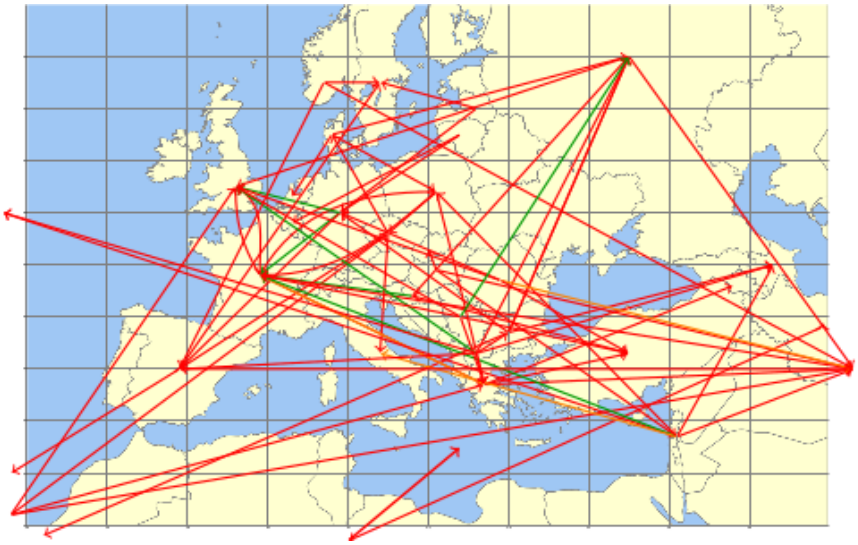

Figure 7. European graph of MWEs referring to nationalities.

7 Additional outcome

Many of the collected MWEs were not exploited for the MWE games but are a valuable source of observations. Those include above 100 examples provided by the contributors as particularly opaque or funny.[10] They can be analyzed in terms of figuration and transparency (Sheinfux et al., 2017). Figuration refers to the degree to which the MWE can be assigned a literal meaning. Most of our examples in the opaque/funny category are figurative and part of the amusing effect stems from the unexpectedness of the image conveyed by their literal reading, as in examples (45)–(48).

(45) viajar na maionese (PT)
'*to travel in the mayonese*' ⇒ TO SAY/THINK SOMETHING SILLY/CRAZY

(46) vzít nohy na ramena (CZ)
'*to take one's legs onto one's shoulders*' ⇒ TO RUN AWAY

(47) prendre des vessies pour des lanternes (FR)
'*take bladders for lanterns*' ⇒ TO BE WRONG

(48) puust piiliites (LV)
'*to blow ducks*' ⇒ TO TELL FAIRYTAILS

Transparency refers to how easy it is to recover the motivation for the idiom due to the relationship between its literal and idiomatic reading. The amusing effect can originate from a high transparency, due to hyperbole or sarcasm, as in examples (49)–(52) or, conversely, from non-transparency, as in (53)–(57).

(49) der er ingen ko på isen (DA)
'*there is no cow on the ice*' ⇒ THERE IS NOTHING TO WORRY ABOUT

(50) κόβω καρφιά (EL) – kovo karfia
'*to cut nails*' ⇒ TO FEEL VERY COLD

(51) itatja az egereket (HU)
'*he makes the mice drink*' ⇒ HE IS CRYING

(52) rope på elgen (NO)
'*call on the moose*' ⇒ TO VOMIT

(53) вешать лапшу на уши (RU) – veshat' lapshu na ushi
'*to hang noodles on somebody's ears*' ⇒ TO DECEIVE, TO TELL LIES

(54) си легна на брашното (MK) – si legna na brashnoto
'*to lie down on the flour*' ⇒ TO RESIGN ONESELF TO ONE'S FATE

[10] The whole dataset is available from the event's page.

(55) tirar los tejos a alguien (ES)
'*to throw tiles to someone*' ⇒ TO FLIRT

(56) į jomarką joti (LT)
'*to ride to the marketplace*' ⇒ TO BE BLUNT (ABOUT KNIVES OR SCISSORS)

(57) kuzunguka mbuyu (SW)
'*to go round a baobab tree*' ⇒ TO BRIBE

The analysis of data gathered from users on MWEs for 10 general meanings (cf. Section 4) also showed that many same or similar metaphors are used in different languages for the same meaning. We selected all those that were shared by at least two languages and offered a new table to the community to fill in the similar MWEs, if they exist, in their languages. It turned out that the most frequent was the rhetoric figure simile *to work like a...* where the empty slot can be filled with *dog* (EN, FR, EL, HR, SR), *horse* (ET, HR, LV, SR), *donkey* (HE, MK), *mule*, *cattle*, and *worm* (HR, SR), and *bullock* (PL). Comparisons with nationalities and ethnic groups included *a Negro* (HR, MK, SR), *a Turk* (LV), and *a Chinese* (ES).

For the meaning TO DO SOMETHING USELESS a number of MWEs were collected:

(58) מַיִם תַּחַן (HE) – Taxan mayim,
'*grind water*'

(59) толочь воду в ступе (RU) – toloch' vodu v stupe
'*to grind water in a mortar*'

(60) a bate apa în piuă (RO)
'*to beat the water in the mill*'

(61) pestare l'acqua nel mortaio (IT)
'*to grind water in a mortar*'

(62) pretakati iz šupljeg u prazno (HR)
'*to pour from hollow into empty*'

(63) کُـبِدَن هَوَن دَر آب (FA) – āb dar hāvan koobidan,
'*pounding water in a pounder*'
TO DO SOMETHING USELESS

The table of similar MWEs across languages for 10 general meanings is publicly available.

8 Conclusions and perspectives

We have presented an effort towards constructing a set of games based on collectively gathered examples of multiword expressions in many languages. These games, aimed at community building, proved successful, if judged by the enthusiastic participation and positive feedback from the network members. The major reason of this success is most probably the very nature of MWEs, whose semantic non-compositionality can be easily exploited for its surprising and amusing effect.

These games were addressed to experts in linguistics and natural language processing, and in MWEs in particular. Extending them to a larger public would be worth examining, notably in language acquisition, foreign language learning, journalism, international relations and many others. We also believe that by extending the scope and coverage of this study to new expressions, languages and countries, interesting correlations between historical and linguistic phenomena might be observed.

Abreviations

BG 'Bulgarian', CZ 'Czech', DA 'Danish', DE 'German', EL 'Greek', EN 'English', ES 'Spanish', EST 'Extrasensory perception', FA 'Farsi', FR 'French', GWAP 'game with a purpose', HE 'Hebrew', HR 'Croatian', HPU 'human processing unit', HU 'Hungarian', IT 'Italian', LT, 'Lithuanian', LV 'Latvian', MK 'Macedonian', MT 'Maltese', MWE 'multiword expression', NLP 'natural language processing', NO 'Norwegian', PL 'Polish', PT 'Brazilian Portuguese', RO 'Romanian', RU 'Russian', SR 'Serbian', SW 'Swahili'

1 Solutions for the General meaning game of the Slavic group from Section 4

(8) – a (TO DIE)
(9) – b (TO BE TIRED)
(10) – b (TO BE TIRED)
(11) – a (TO DIE)
(12) – d (TO BE ANGRY)
(13) – a (TO DIE)
(14) – c (TO BE STUPID)
(15) – c (TO BE STUPID)

(16) – d (TO BE ANGRY)
(17) – c (TO BE STUPID)
(18) – d (TO BE ANGRY)
(19) – b (TO BE TIRED)

2 Solution to the quizzes on the (globally and locally) highest number of incoming edges from Section 6

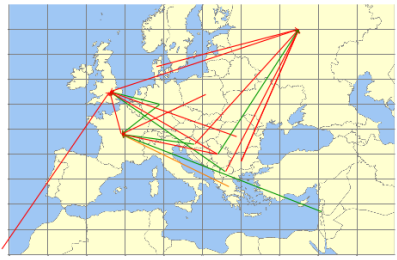

Figure 8. France, Russia and UK: three European countries with the highest number of incoming edges. Sample MWEs are listed in Ex. (64)-(66)

Figure 9. Turkey: the country gathering the highest number of incoming edges stemming from the Balkan region. Sample MWEs are listed in Ex. (67)-(70)

(64) (só) pra inglês ver (PT)
'*(just) for English people to see*' ⇒ (JUST) FOR THE SAKE OF APPEARANCES
(65) Francuski poljubac (HR)
FRENCH KISS
(66) en by i Rusland (DA)
'*a town in Russia*' ⇒ SOMETHING ENTIRELY IRRELEVANT
(67) Puši k'o Turčin (HR)
a fuma ca un turc (RO)
'*to smoke like a Turk*' ⇒ TO SMOKE A LOT
(68) γίνομαι Τούρκος (EL) – jinome Turkos
'*to become a Turk*' ⇒ TO BECOME FURIOUS

(69) turcul plătește (RO)
'*the Turk pays*' ⇒ ONE HAS TO TAKE RESPONSIBILITY FOR SOMETHING THAT ONE DIDN'T DO

(70) пролазити као поред турског гробља (SR) – prolaziti kao pored turskog groblja
'*to go by as near a Turkish cemetery*' ⇒ TO PASS BY WITHOUT PAYING ATTENTION

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