Normative Data for Novel Nominal Metaphors, Novel Similes, Literal, and Anomalous Utterances in Polish and English

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Abstract
The two studies reported in the article provide normative measures for 120 novel nominal metaphors, 120 novel similes, 120 literal sentences, and 120 anomalous utterances in Polish (Study 1) and in English (Study 2). The presented set is ideally suited to addressing methodological requirements in research on metaphor processing. The critical (sentence-final) words of each utterance were controlled for in terms of their frequency per million, number of letters and syllables. For each condition in each language, the following variables are reported: cloze probability, meaningfulness, metaphoricity, and familiarity, whose results confirm that the sentences are well-matched. Consequently, the present paper provides materials that can be employed in order to test the new as well as existing theories of metaphor comprehension. The results obtained from the series of normative tests showed the same pattern in both studies, where the comparison structure present in similes (i.e., \(A\ is\ like\ B\)) facilitated novel metaphor comprehension, as compared to categorical statements (i.e., \(A\ is\ B\)). It therefore indicates that comparison mechanisms might be engaged in novel meaning construction irrespectively of language-specific syntactic rules.

Keywords
Metaphors · Normative data · Novel nominal metaphors · Novel similes · Polish · English · Cloze probability · Meaningfulness · Familiarity · Metaphoricity · Comparison mechanisms

Introduction

In studies on language processing, the use of well-controlled stimuli is crucial, especially in research employing behavioral or neuroimaging methods, whose results are highly influenced by stimuli characteristics, including, but not limited to, word frequency, meaningfulness, and familiarity (Balota et al. 2006). It is therefore of a great importance to ensure that the stimuli used in such studies have been thoroughly normed for the variables that are important to control for, taking into account the specific research questions that are to be addressed in the experiment proper. Oftentimes, researchers employing quantitative research methods use a shared database of the stimuli that have already been appropriately...
normed so as to ensure consistency across different projects and laboratories, where the studies are conducted (Campbell and Raney 2016). The present paper provides a database on Polish (Study 1) and English (Study 2) novel nominal metaphors, novel similes, literal, and anomalous sentences that have all been normed on a number of factors in order to ensure that they can effectively be employed in further studies on novel metaphoric and literal language processing.

Metaphoric utterances, such as *That lawyer is a shark*, are defined as conveying meanings that do not refer to their literal sense (De Grauwe et al. 2010). Consequently, metaphor comprehension is assumed to require the process of cross-domain mapping, in which common features of two concepts (i.e., metaphor source—*shark*, and metaphor target—*lawyer*) need to be recognized and structurally aligned (Gibbs and Colston 2012; Bowdle and Gentner 2005). Importantly, as postulated within the Career of Metaphor Model (Bowdle and Gentner 2005), metaphor comprehension is highly modulated by how lexicalized (conventional) a metaphor source is, since a conventional metaphor source, as a result of its repeated use, has both a literal and metaphoric reference. Namely, a conventional metaphor such as *That lawyer is a shark* involves a source domain (*shark*) that is polysemous and can denote either a literal (i.e., a predator) or a nonliteral, metaphoric sense (i.e., someone who unscrupulously exploits others; Gentner and Bowdle 2001). This dual reference results in the fact that conventional metaphors might be comprehended as either comparisons or categorizations, with categorization mechanisms being more favorable, as they are faster and less cognitively intensive. In contrast, novel metaphors are not characterized by such a dual reference, as their source domains refer to domain-specific, literal concepts, as a result of which novel metaphoric utterances can be understood only by means of comparison. Consequently, while conventional (familiar) metaphors require meaning retrieval mechanisms, novel (unfamiliar) metaphorical utterances involve the processes of meaning construction that are based on comparison between the source and target domain. A distinction between novel and conventional metaphors, in line with the Career of Metaphor Model (Bowdle and Gentner 2005), is presented in Fig. 1.

The model therefore assumes that novel metaphoric meanings are easier to comprehend when presented as similes (*A is like B*) compared to nominal (categorical) sentences (*A is B*), due to the fact that the form of a simile automatically initiates comparison mechanisms

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**Fig. 1** Novel and conventional metaphor comprehension according to the Career of Metaphor Model (after Bowdle and Gentner 1999: 92)
that are engaged in novel metaphor processing. Such a hypothesis has previously been supported in a number of behavioral, electrophysiological, and neuroimaging studies (e.g., Bowdle and Gentner 2005; Shibata et al. 2012; Lai and Curran 2013), suggesting that the processing of novel similes is less cognitively taxing compared to novel nominal metaphors.

However, thus far little attention has been devoted to directly comparing novel metaphor comprehension across different languages. Consequently, the question whether the comparison structure facilitates novel meaning comprehension irrespectively of language-specific grammatical properties remains under-investigated. In order to provide valid insights into that notion, it seems crucial to compare languages in which a simile and categorical structure require a syntactically-different realization. For instance, in Polish and English, categorical statements differ in terms of their morpho-syntactic forms (i.e., Polish: A to B; English: A is B). Although in both languages, they include copular clauses, in English, a verbal copula to be needs to be explicitly stated, while in Polish, categorical sentences include a pronominal copula, which is dropped (Bondaruk 2014). On the other hand, using a verbal copula in Polish, which is a highly inflected language, would result in a sentence structure where a verbal copula to be (i.e., A jest B) marks the predicate for instrumental. In contrast, in the case of English categorical statements, a verbal copula to be (i.e., A is B) marks the predicate for nominative. It needs to be noted that since in Polish instrumental is much more structurally complex relative to nominative, metaphor source domains should be embedded in sentences where predicates are marked for nominative by using a pronominal copula (i.e., A to B). The two studies reported in the present article aim to show whether a comparison form present in similes facilitates novel metaphor comprehension in both Polish and English, with Polish nominal statements involving a pronominal copula, and English nominal statements involving a verbal copula.

Importantly, previous research into metaphor comprehension has indicated that, apart from metaphor conventionality, other factors modulating metaphoric meaning processing include the level of predictability, meaningfulness, and metaphoricity of the stimuli (De Grauwe et al. 2010; Jankowiak 2019). All of these variables might be measured by, for instance, employing rating Likert-type scales (Likert 1932), where participants rate utterances by means of selecting an appropriate numerical value on a predetermined scale (Gravetter and Forzano 2012). Likert-type scales have previously been used as a measure in conventionality (familiarity), meaningfulness, and metaphoricity ratings on metaphoric stimuli.

Familiarity is defined as the frequency of encountering an utterance (Gernsbacher 1984; Libben and Titone 2008; Tabossi et al. 2011; Nordmann et al. 2014), and has been shown to highly influence the process of word recognition to the point that it has been referred to as a strong predictor of the speed and accuracy of language processing (Connine et al. 1990; Ellis 2002). In research on metaphor processing, familiarity is understood in terms of meaning conventionality, with higher familiarity ratings for more conventional metaphors (Jankowiak et al. 2017). Additionally, the level of familiarity is interpreted as positively correlated with the subjective frequency of lexical items, as less familiar utterances are less frequently encountered in everyday language.

Next, the level of metaphoricity of an utterance provides answers to the question whether an expression, in order to make sense, needs to be interpreted literally or metaphorically. To this aim, metaphoricity ratings involve participants deciding how metaphoric or literal a given expression is. In studies on metaphor comprehension, metaphoricity ratings are aimed to confirm that novel metaphoric meanings are perceived as more metaphoric than conventional metaphors, both of which are more metaphoric than literal utterances (Arzouan et al. 2007; Yang et al. 2013).
Yet another variable that has been suggested to strongly modulate cognitive mechanisms engaged in metaphor comprehension is the predictability of an utterance (Sperber and Wilson 1986; Frisson and Pickering 2001; Katz and Ferretti 2001). The level of predictability is often tested by means of employing a cloze probability test, whose aim is to examine how much a context sentence suggests a to-be-inferred concept. Consequently, a cloze probability test is employed to investigate if the critical items are embedded in low or highly constraining contexts (Monzó and Calvo 2002). In such a test, participants are provided with utterances which are truncated before the final critical word (e.g., She bought some apples and ________). Respondents are asked to provide the first word that comes to their mind so that the sentence would be meaningful and grammatically correct (Bambini et al. 2013). It has been suggested that the processing of an upcoming lexical item is facilitated when presented in a predictable context compared to a non-predictable one (e.g., Kutas and Hillyard 1984; Zola 1984; Schwanenfluegel and Shoben 1985; Rayner and Pollatsek 1989). In metaphor processing, previous studies have revealed lower predictability for metaphoric than literal utterances, with novel metaphors eliciting lower results in cloze probability tests relative to conventional metaphors (e.g., Coulson and Van Petten 2002; Jankowiak et al. 2017).

All of the aforementioned variables influencing the process of metaphor comprehension have been tested in the two present studies, which were aimed to examine the level of predictability, meaningfulness, familiarity, and metaphoricity of Polish (Study 1) and English (Study 2) novel nominal metaphors, novel similes, literal, and anomalous sentences. By means of controlling the above-mentioned factors, the two studies provide valid insights into whether it is a comparison structure that facilitates novel meaning comprehension in Polish and English. As the two languages differ in the grammatical structures of categorical and comparison sentences, similar patterns of results observed in both Polish and English would indicate that the syntactic structure itself does not modulate complex semantic operations that are engaged in novel metaphor comprehension. Finally, the study aims to provide stimuli to serve as well-controlled materials perfectly suited to further examine a number of other different aspects of novel metaphoric meaning comprehension, and to test competing theories of how novel metaphors are constructed and processed in the human brain.

**Study 1: Polish Stimuli**

**Method**

**Participants**

Participants taking part in the surveys were all Polish native speakers, and were recruited from online social media, research mailing lists, and language forums. Participants spent less than 15 min to complete each survey. Importantly, raters who failed to complete the entire survey were removed from the analyses. Cloze probability tests were completed by 140 participants ($M_{age} = 22.83, SD = 2.52; 123$ females), meaningfulness ratings—by 132 participants ($M_{age} = 21.8, SD = 2.4; 115$ females), familiarity ratings—by 101 participants ($M_{age} = 22.33, SD = 2.37; 80$ females), and metaphoricity ratings—by 102 participants ($M_{age} = 23.32; SD = 2.4, 87$ females).
Materials and Design

Materials used in the ratings included 120 novel nominal metaphors (e.g., Blizny to pamiętnik; Eng: Scars are a diary), 120 novel similes (e.g., Blizny są jak pamiętnik; Eng: Scars are like a diary), 120 literal (e.g., Ten egzemplarz to pamiętnik; Eng: This copy is a diary), and 120 anomalous sentences (e.g., Ten młot jest jak pamiętnik; Eng: This hammer is a diary). Each set shared the same sentence-final word, which was always a concrete noun. Novel nominal metaphors and novel similes shared the same target and source domain, and they differed only in their syntactic structure (i.e., A to B; Eng: A is B vs. A jest jak B; Eng: A is like B). Additionally, the critical words were controlled for in terms of their frequency per million ($M = 4.68$, $SD = .45$, range 2.47–4.7), number of syllables ($M = 2.34$, $SD = .48$, range 2–3), and number of letters ($M = 6.57$, $SD = 1.45$, range 4–11). Frequency values were calculated using the SUBTLEX-PL corpus (Mandera et al. 2014). The mean sentence lengths of the stimuli ranged from 3 to 5; novel nominal metaphors: $M = 3.28$, $SD = .50$, novel similes: $M = 4.28$, $SD = .48$, literal sentences: $M = 4.00$, $SD = .18$, and anomalous sentences: $M = 3.71$, $SD = .57$. The list of Polish stimuli is provided in Appendix 1.

Procedure

All of the normative studies were conducted using an online survey-development cloud-based software that enabled designing web-based surveys and collecting survey responses. For the normative tests, the materials were divided into four (meaningfulness ratings) or three (cloze probability tests, familiarity, and metaphoricity ratings) blocks so as to avoid the repetition of the critical word within one block. While meaningfulness ratings included all types of utterances (i.e., novel nominal metaphors, novel similes, literal, and anomalous sentences), normative tests on cloze probability, familiarity, and metaphoricity involved meaningful stimuli only (i.e., novel nominal metaphors, novel similes, and literal utterances).

Participants first gave their consent, after which they were provided with general instructions about the task. In all cases, the instructions were presented together with several examples and explanations. Each participant completed only one block, and rated the presented 120 sentences (in meaningfulness ratings) or 90 sentences (in cloze probability tests, familiarity, and metaphoricity ratings). All of the rating scales included 7-point Likert-type scales, i.e. meaningfulness ratings: 1—totally meaningless, 7—totally meaningful; familiarity ratings: 1—very rarely, 7—very frequently; metaphoricity ratings: 1—very literal, 7—very metaphorical). In cloze probability tests, raters were provided with the beginning of a sentence, and were asked to write a critical word (a noun) which first came to their mind, so that the whole sentence would be meaningful and syntactically correct. The order of stimuli presentation within each survey was randomized and counterbalanced across participants, with an equal number of stimuli per each condition presented to all participants.

For the normative studies with rating scales on stimuli meaningfulness, familiarity, and metaphoricity, analyses of variance (ANOVA) were conducted, whose results are reported below. Significance values for pairwise comparisons were corrected for multiple comparisons using the Bonferroni correction. If Mauchly’s tests indicated that the
assumption of sphericity was violated, the Greenhouse–Geisser correction was applied. In such cases, the original degrees of freedom are reported with the corrected p value.

**Results**

To determine the reliability of the norming tests, intraclass correlation coefficients were calculated for all dimensions requiring a subjective rating. All measures indicated a high consistency across raters (Table 1).

**Cloze probability tests**

Cloze probability tests were carried out with a view to ensuring that all of the critical (sentence-final) words were not expected due to the preceding context. Table 2 summarizes the results obtained from the cloze probability tests (reported as the percentage of participants who completed the presented sentence with a critical word) together with familiarity ratings and the correlation between the two variables.

**Meaningfulness ratings**

To evaluate the meaningfulness of the sentences, raters assessed them on a scale from 1 (totally meaningless) to 7 (totally meaningful). The analysis showed a main effect of utterance type, \( F(3, 384) = 906.25, p < .001, \varepsilon = .774, \eta_p^2 = .876. \) Pairwise comparisons further revealed that literal sentences (\( M = 5.66, SE = .07 \)) were rated as more meaningful than novel similes (\( M = 4.42, SE = .08 \)), \( p < .001 \), novel similes were rated as more meaningful than novel nominal metaphors (\( M = 3.87, SE = .08 \)), \( p < .001 \), and novel nominal metaphors were assessed as more meaningful compared to anomalous utterances (\( M = 1.80, SE = .06 \)), \( p < .001 \).
Familiarity ratings

In order to examine the familiarity of the stimuli, raters decided how often they encountered the presented novel nominal metaphors, novel similes, and literal sentences on a scale from 1 (very rarely) to 7 (very frequently). The obtained results revealed a main effect of sentence type, $F(2, 196) = 45.94$, $p < .001$, $\varepsilon = .562$, $\eta_p^2 = .319$. Pairwise comparisons confirmed that novel nominal metaphors ($M = 1.80$, $SE = .09$) were less familiar than both novel similes ($M = 1.88$, $SE = .09$), $p = .014$, and literal sentences ($M = 2.51$, $SE = .13$), $p < .001$. Furthermore, novel similes were less familiar than literal utterances, $p < .001$.

Metaphoricity ratings

In order to assess the metaphoricity of the stimuli, raters decided how metaphorical or literal novel nominal metaphors, novel similes, and literal sentences were on a scale from 1 (very literal) to 7 (very metaphorical). The analysis showed a main effect of sentence type, $F(2, 198) = 902.18$, $p < .001$, $\varepsilon = .658$, $\eta_p^2 = .901$. Pairwise comparisons further showed that novel similes ($M = 5.73$, $SE = .08$) were rated as more metaphorical than novel nominal metaphors ($M = 5.53$, $SE = .08$), $p = .001$, as well as than literal sentences ($M = 1.86$, $SE = .07$), $p < .001$. Additionally, novel nominal metaphors were rated as more metaphorical than literal utterances, $p < .001$. Figure 2 presents meaningfulness, metaphoricity, and familiarity ratings for the materials.

The overall means obtained from the normative tests confirmed desired differences between the conditions. Table 3 provides interscale correlations between stimuli dimensions, and Table 4 presents the summary of stimuli characteristics by sentence type.

![Fig. 2 Study 1: Meaningfulness, metaphoricity, and familiarity ratings for novel nominal metaphors, novel similes, literal, and anomalous sentences](Image)
Study 2: English Stimuli

Method

Participants

Participants taking part in the web-based surveys were all English native speakers, and were recruited from online social media, research mailing lists, and language forums. Participants spent less than 15 min to complete each survey. Importantly, raters who failed to complete the entire survey were removed from the analyses. Cloze probability tests were completed by 152 participants ($M_{age} = 26.31$, $SD = 9.99$; 78 females), meaningfulness ratings—by 119 participants ($M_{age} = 24.28$, $SD = 8.03$; 62 females), familiarity ratings—by 87 participants ($M_{age} = 26.61$, $SD = 10.2$; 40 females), and metaphoricity ratings—by 87 participants ($M_{age} = 25.96$, $SD = 9.02$; 44 females).
## Table 4

Study 1: Summary of stimuli characteristics by sentence type

|                         | Novel nominal metaphors | Novel similes | Literal sentences | Anomalous sentences |
|-------------------------|-------------------------|---------------|-------------------|---------------------|
|                         | $M$  | $SD$  | Range           | $M$  | $SD$  | Range           | $M$  | $SD$  | Range           |
| Number of words per sentence | 3.29 | .50  | 3–5             | 4.28 | .48  | 4–6             | 4.00 | .18  | 3–5             | 3.71 | .57  | 3–5             |
| Meaningfulness ratings   | 3.83 | .79  | 2.37–6.14       | 4.36 | .82  | 2.29–5.91       | 5.56 | .65  | 3.57–6.63       | 1.82 | .31  | 1.28–2.86       |
| Familiarity ratings      | 1.84 | .44  | 1.2–3.26        | 1.92 | .49  | 1.17–3.51       | 2.51 | .53  | 1.43–4.57       | n/a  |       |                 |
| Metaphoricity ratings    | 5.51 | .47  | 4–6.28          | 5.69 | .36  | 4.68–6.28       | 1.93 | .46  | 1.34–4.74       | n/a  |       |                 |
Materials and Design

Materials used in the ratings included 120 novel nominal metaphors (e.g., *Viruses are travellers*), 120 novel similes (e.g., *Viruses are like travellers*), 120 literal (e.g., *These people are travellers*), and 120 anomalous sentences (e.g., *Tables are travellers*). Similarly to the stimuli tested in Study 1, each set shared the same sentence-final word, which was always a concrete noun. Novel nominal metaphors and novel similes shared the same target and source domain, and they differed only in their syntactic structure (i.e., *A is B* vs. *A is like B*). The critical words were controlled for in terms of their frequency per million (\(M = 3.93, SD = .56, \text{range } 2.47–4.95\)), number of syllables (\(M = 2.19, SD = .39, \text{range } 2–3\)), and number of letters (\(M = 6.87, SD = 1.24, \text{range } 5–10\)). Frequency values were calculated using the SUBTLEX-UK corpus (van Heuven et al. 2014). The mean sentence lengths of the stimuli ranged from 3 to 7; novel nominal metaphors: \(M = 4.12, SD = .82\), novel similes: \(M = 5.12, SD = .83\), literal sentences: \(M = 4.82, SD = .66\), and anomalous sentences: \(M = 4.86, SD = .94\). The list of English stimuli is provided in Appendix 2.

Procedure

The procedures applied in the normative tests on English stimuli were the same as those used in Study 1.

Results

To determine the reliability of the norming tests, intraclass correlation coefficients were calculated for all dimensions requiring a subjective rating. All measures indicated high consistency across raters (Table 5).

Cloze Probability Tests

Cloze probability tests were carried out with a view to ensuring that all of the critical (sentence-final) words were not expected due to the preceding context. Table 6 summarizes the results obtained from the cloze probability tests (reported as the percentage of participants who completed the presented sentence with a critical word), together with familiarity ratings and the correlation between the two variables.

Meaningfulness Ratings

To evaluate the meaningfulness of the sentences, raters assessed them on a scale from 1 (totally meaningless) to 7 (totally meaningful). The analysis showed a main effect of utterance

| Table 5 | Study 2: Interclass correlation coefficients for the rating tasks |
|---------|---------------------------------------------------------------|
| Dimension          | Interclass correlation coefficient |
| Meaningfulness     | .910                                           |
| Familiarity        | .946                                           |
| Metaphoricity      | .890                                           |
type, $F(3, 345) = 2026.18, p < .001, \varepsilon = .872, \eta_p^2 = .946$. Pairwise comparisons further revealed that literal sentences ($M = 5.92, SE = .05$) were rated as more meaningful than novel similes ($M = 4.98, SE = .05$), $p < .001$, novel similes were rated as more meaningful than novel nominal metaphors ($M = 4.50, SE = .05$), $p < .001$, and novel nominal metaphors were assessed as more meaningful compared to anomalous utterances ($M = 1.85, SE = .05$), $p < .001$.

**Familiarity Ratings**

In order to examine the familiarity of the stimuli, raters decided how often they encountered the presented novel nominal metaphors, novel similes, and literal sentences on a scale from 1 (very rarely) to 7 (very frequently). The obtained results revealed a main effect of sentence type, $F(2, 168) = 159.86, p < .001, \varepsilon = .661, \eta_p^2 = .656$. Pairwise comparisons confirmed that novel nominal metaphors ($M = 2.00, SE = .06$) were less familiar than both novel similes ($M = 2.13, SE = .07$, $p < .001$), and literal utterances, $p < .001$. Furthermore, novel similes were less familiar than literal utterances, $p < .001$.

**Metaphoricity Ratings**

In order to assess the metaphoricity of the stimuli, raters decided how metaphorical or literal novel nominal metaphors, novel similes, and literal sentences were on a scale from 1 (very literal) to 7 (very metaphorical). The analysis showed a main effect of sentence type, $F(2, 168) = 2466.83, p < .001, \varepsilon = .847, \eta_p^2 = .967$. Pairwise comparisons further showed that novel nominal metaphors ($M = 5.85, SE = .04$) were rated as more metaphorical than novel similes ($M = 5.61, SE = .07$, $p < .001$), as well as than literal sentences ($M = 1.76, SE = .03$, $p < .001$). Additionally, novel similes were rated as more metaphorical than literal utterances, $p < .001$. Figure 3 presents meaningfulness, metaphoricity, and familiarity ratings for the materials.

The overall means obtained from the normative tests confirmed desired differences between the conditions. Table 7 provides interscale correlations between stimuli dimensions, and Table 8 presents the summary of stimuli characteristics by sentence type.

**Correlation Analyses Between Study 1 and Study 2**

The correlation analyses were carried out for Study 1 and Study 2 on the meaningfulness, familiarity, and metaphoricity ratings, and were conducted on averaged values for all novel similes, novel nominal metaphors, literal, and anomalous sentences. The results showed a strong positive correlation between in the two studies on meaningfulness ratings.
(r(478) = .79, p < .001), familiarity ratings (r(358) = .28, p < .001), and metaphoricity ratings (r(358) = .90, p < .001). Figures 4, 5, and 6 show scatterplots representing the correlations between the two studies on meaningfulness, familiarity, and metaphoricity, respectively.

Discussion and Conclusions

The present article was aimed to provide normative data for a set of Polish (Study 1) and English (Study 2) novel nominal metaphors, novel similes, literal, and anomalous sentences, and to show whether differences in the syntactic structures of the two languages modulate comparison and categorization mechanisms engaged in novel metaphor comprehension.

The obtained results showed that novel similes elicited higher meaningfulness ratings compared to novel nominal metaphors, which is in line with the Career of Metaphor Model (Bowlde and Gentner 2005), and indicates that comparison processes initiated by similes facilitate novel meaning comprehension, and consequently, a form of a simile might ease novel metaphor construction. Under this view, novel metaphoric meanings need to undergo the process of comparison and alignment between the target domain and the literal meaning of the source domain (Bowlde and Gentner 1999; Zharikov and Gentner 2002). Such results are in line with a reaction time (RT) study conducted by Bowlde and Gentner (2005), who observed faster RTs for novel comparisons than novel categorizations, as well as in accordance with an fMRI (functional Magnetic Resonance Imaging) study conducted by Shibata et al. (2012), who found extended brain activation in the right inferior frontal gyrus in response to novel nominal metaphors relative to novel similes.

The observed results might also be interpreted as in line with the Relevance Theory (Sperber and Wilson 1986), which views meaning conventionality as a modulating factor.

Fig. 3 Study 2: Meaningfulness, metaphoricity, and familiarity ratings for novel nominal metaphors, novel similes, literal, and anomalous sentences
in metaphor vs. simile comprehension, and assumes different explicatures that are communicated by the two types of utterances. Namely, novel creative metaphorical meanings are more likely to be conveyed via similes, which are postulated to require lexically encoded concepts. Conventionalized meanings, in contrast, are usually understood in terms of ad hoc concepts, whose meanings can be implied by typical connotations of metaphor source concept (Carston and Wearing 2011; Jankowiak 2019).

A preference for similes in communicating novel meanings is also in line with the Semantic Space Model (Utsumi 2011), which is based on the Predication Model (Kintsch 2001). In the Semantic Space Model, the meaning of each lexical item takes the form of a semantic space based on word occurrence. Based on this, a semantic similarity between two lexical items can be computed by comparing their respective semantic spaces. In the simulation experiment, Utsumi (2011) showed that categorization processes facilitate conventionalized meaning comprehension, while semantically diverse entities (i.e., novel metaphors) are easier to be interpreted as comparisons.

Importantly, the present results showed the same pattern of results in both Polish and English, therefore indicating that mechanisms involved in novel metaphor processing are similar even in languages with different syntactic rules governing the structure of similes and categorical statements. Thus, though there are differences in the morpho-syntactic

| Table 7 Study 2: Interscale correlations between stimuli dimensions |
|---------------------------------------------------------------|
| **Novel nominal metaphors**                                  |
| Cloze probability | Meaningfulness | Familiarity | Metaphoricity |
| Cloze probability | 1 | .040 | .023 | .014 |
| | | $p > .05$ | $p > .05$ | $p > .05$ |
| Meaningfulness | .040 | 1 | .760** | - .317** |
| | | $p > .05$ | $p < .001$ | $p < .001$ |
| Familiarity | .023 | .760** | 1 | - .359** |
| | | $p > .05$ | $p < .001$ | $p < .001$ |
| Metaphoricity | .014 | - .317** | - .359** | 1 |
| | | $p > .05$ | $p < .001$ | $p < .001$ |
| **Novel similes**                                            |
| Cloze probability | Meaningfulness | Familiarity | Metaphoricity |
| Cloze probability | 1 | - .003 | .001 | .072 |
| | | $p > .05$ | $p > .05$ | $p > .05$ |
| Meaningfulness | - .003 | 1 | .760** | - .264** |
| | | $p > .05$ | $p < .001$ | $p < .001$ |
| Familiarity | .001 | .760** | 1 | - .297** |
| | | $p > .05$ | $p < .001$ | $p < .001$ |
| Metaphoricity | .072 | - .264** | - .297** | 1 |
| | | $p > .05$ | $p < .001$ | $p < .001$ |
| **Literal sentences**                                        |
| Cloze probability | Meaningfulness | Familiarity | Metaphoricity |
| Cloze probability | 1 | .120 | .056 | - .004 |
| | | $p > .05$ | $p > .05$ | $p > .05$ |
| Meaningfulness | .120 | 1 | .714** | - .475 |
| | | $p > .05$ | $p < .001$ | $p < .001$ |
| Familiarity | .056 | .714** | 1 | - .475 |
| | | $p > .05$ | $p < .001$ | $p < .001$ |
| Metaphoricity | - .004 | - .475 | - .475 | 1 |
| | | $p > .05$ | $p < .001$ | $p < .001$ |
|                          | Novel nominal metaphors | Novel similes | Literal sentences | Anomalous sentences |
|--------------------------|-------------------------|---------------|------------------|--------------------|
|                          | $M$         | $SD$         | Range           | $M$         | $SD$         | Range           | $M$         | $SD$         | Range           |
| Number of words per sentence | 4.12    | .82         | 3–6              | 5.12    | .83         | 4–7              | 4.82    | .66         | 4–7              | 4.86    | .94         | 3–6              |
| Meaningfulness ratings    | 4.50    | 1.03        | 2.48–6.44        | 4.98    | .89         | 3.03–6.74        | 5.92    | .72         | 3.59–6.97        | 1.85    | .36         | 1.23–2.52        |
| Familiarity ratings       | 2.00    | .78         | 1.03–4.93        | 2.13    | .74         | 1.10–4.67        | 2.92    | .86         | 1.40–5.37        | n/a     | n/a         | n/a              |
| Metaphoricity ratings     | 5.85    | .80         | 1.76–6.76        | 5.61    | .55         | 3.28–6.34        | 1.76    | .68         | 1.00–4.17        | n/a     | n/a         | n/a              |
forms of Polish and English categorical statements (i.e., Polish: A to B; English: A is B), with a verbal copula to be explicitly stated in English, and a pronominal copula dropped in Polish (Bondaruk 2014), the cognitive mechanisms engaged in arriving at semantically complex, novel metaphoric meanings seem to be irrespective of such language-specific differences. This in turn suggests that mental operations involved in semantic analyses and meaning integration might be superior to syntactic analyses, probably due to extended
semantic mechanisms that are required when comprehending unfamiliar, poetic meanings. Further research is, nonetheless, needed in order to examine whether similar patterns of results would be observed in behavioral or electrophysiological studies employing such a between-language design to investigate comparison mechanisms in novel metaphor comprehension.

In addition, meaningfulness ratings for the two studies showed that literal utterances were perceived as most meaningful, followed by novel similes, novel nominal metaphors, and finally anomalous sentences. Importantly, novel metaphors, being very poetic and rarely used in everyday language, still elicited higher meaningfulness ratings as compared to anomalous utterances, thus confirming that the raters were able to arrive at a nonliteral interpretation of novel metaphoric meanings.

The stimuli presented in the present paper have been thoroughly examined in terms of their level of predictability, meaningfulness, familiarity (conventionality), and metaphoricity. Additionally, the critical (final) words of each sentence were selected so that they were all matched on their frequency, concreteness, number of letters and syllables. This is of special importance for any behavioral and electrophysiological research, where dependent variables (e.g., reaction times, event-related brain potentials) are time-locked to the presentation of the sentence-final word. As a result, it is assured that the observed differences in the results elicited in response to different conditions are dependent only on the category of a sentence (i.e., metaphorical, literal, or anomalous), as other lexico-semantic variables influencing language processing were highly controlled for.

Importantly, previous studies on metaphor comprehension have rarely tested stimuli in four separate normative tests (i.e., cloze probability, meaningfulness, metaphoricity, and familiarity), and they most often involved familiarity and/or interpretability ratings, or were limited to controlling only the critical items in terms of their frequency and number of letters. Additionally, previous research has rarely employed 7-point Likert scales, while using such a scale has been proven advantageous, as raters often seem to avoid extreme
categories (e.g., 1 or 7), and therefore a scale with fewer than 5 categories would likely provide a too limited number of responses to select from. Furthermore, raters might find it relatively difficult to discriminate between too many categories, and as a result, they could blend them when provided with more than 9 categories to choose from (Gravetter and Forzano 2012).

The aim of the two present studies was to provide a database of Polish and English novel nominal metaphors, novel similes, literal, and anomalous sentences with variables that have been previously shown to impact the processing of such utterances (i.e., predictability, meaningfulness, familiarity, metaphoricity). The same patterns of results observed in both Polish and English suggest that, although the two languages differ in their grammatical rules to a great extent, the syntactic structures themselves seem not to modulate comparison and categorization mechanisms engaged in novel metaphor comprehension, therefore suggesting that novel simile comprehension is facilitated by a comparison form, irrespectively of language. The large number of items and normed factors influencing language processing that are provided in the two present studies maximize the stimuli flexibility, as they can be effectively employed to suit a number of different research questions, populations, tasks, and designs. The final set of stimuli was selected so that novel similes, novel nominal metaphors, literal, and anomalous sentences are matched for sentence length, meaningfulness, familiarity, metaphoricity, and cloze probability, and the critical words are additionally matched for frequency, number of letters and syllables. The present database will hopefully provide a useful tool to anyone researching the processing and comprehension of metaphoric meanings in Polish and English, in both the monolingual and bilingual populations.

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**Compliance with ethical standards**

**Conflict of interest** The author declares no conflict of interest.

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**Appendix 1**

See Table 9.
| Polish stimuli | Table 9 Polish stimuli |
|----------------|-----------------------|
| **Novel nominal metaphors** | **Novel similes** | **Literal sentences** | **Anomalous sentences** |
| Życie to parkiet | Życie jest jak parkiet | Ta nawierzchnia to parkiet | Cukierek jest jak parkiet |
| Twarz to plakat | Twarz jest jak plakat | Ten arkusz to plakat | Małka jest jak plakat |
| Błąd to przepaść | Błąd jest jak przepaść | Ta szczelina to przepaść | Manekin jest jak przepaść |
| Zatarg to płomień | Zatarg jest jak płomień | To światło to płomień | Klucz to płomień |
| Miłość to klasztor | Miłość jest jak klasztor | Ten zabytek to klasztor | Dywan jest jak klasztor |
| Natura to apteka | Natura jest jak apteka | Ten sklep to apteka | Czapka to apteka |
| Uczucia to oddech | Uczucia są jak oddech | Ten proces to oddech | Rękawice są jak oddech |
| Uczelnia to królestwo | Uczelnia jest jak królestwo | Szwecja to królestwo | Cyrikel jest jak królestwo |
| Pamięć to torba | Pamięć jest jak torba | To opakowanie to torba | Ekran to torba |
| Przeszłość to plama | Przeszłość jest jak plama | Ten ślad to plama | Hamulec to plama |
| Uroda to korona | Uroda jest jak korona | Ta ozdoba to korona | Linijka jest jak korona |
| Talent to winda | Talent jest jak winda | To pomieszczenie to winda | Kałuża jest jak winda |
| Skóra to koszula | Skóra jest jak koszula | To okrycie to koszula | Wiatrak to koszula |
| Mózg to szafa | Mózg jest jak szafa | Ten mebel to szafa | Gazeta to szafa |
| Obraźka to łańcuch | Obraźka jest jak łańcuch | Ta linia to łańcuch | Kredka to łańcuch |
| Instynkt to władz | Instynkt jest jak władca | Ten rycerz to władca | Śliwka jest jak władca |
| Człowiek to kropla | Człowiek jest jak kropla | Ta resztką to kropla | Brama jest jak kropla |
| Życiorys to ulotka | Życiorys jest jak ulotka | Ten druczek to ulotka | Lakier jest jak ulotka |
| Tradycja to skała | Tradycja jest jak skała | Ta przeszkoda to skała | Śniadanie to skała |
| Nieśmiałość to korek | Nieśmiałość jest jak korek | To tworzywo to korek | Klamka to korek |
| Osobowość to krajobraz | Osobowość jest jak krajobraz | Ten malunek to krajobraz | Włocznia jest jak krajobraz |
| Brzuch to worek | Brzuch jest jak worek | Ten plastik to worek | Słabian jest jak worek |
| Sumienie to dzwonek | Sumienie jest jak dzwonek | Ten instrument to dzwonek | Chleb jest jak dzwonek |
| Rozsądek to adwokat | Rozsądek jest jak adwokat | Ten zawód to adwokat | Kierownica to adwokat |
| Istnienie to świeca | Istnienie jest jak świeca | To oświetlenie to świeca | Rower jest jak świeca |
| Kościół to schronisko | Kościół jest jak schronisko | Ten dom to schronisko | Grabie to schronisko |
| Makijaż to tarcza | Makijaż jest jak tarcza | To uzbrojenie to tarcza | Sałatka jest jak tarcza |
| Novel nominal metaphors | Novel similes | Literal sentences | Anomalous sentences |
|------------------------|--------------|------------------|-------------------|
| Potomek to lustro      | Potomek jest jak lustro | Ta powierzchnia to lustro | Gałąź jest jak lustro |
| Rozterki to burza      | Rozterki są jak burza | Ten odgłos to burza | Wazon to burza |
| Starość to kronika    | Starość jest jak kronika | Ta książka to kronika | Spinka jest jak kronika |
| Ten związek to wózek  | Ten związek jest jak wózek | Ten pojazd to wózek | Kabel jest jak wózek |
| Prawo to mundur        | Prawo jest jak mundur | Ten strój to mundur | Piekarnik jest jak mundur |
| Ciało to koperta       | Ciało jest jak koperta | Ten papier to koperta | Woda jest jak koperta |
| Serce to zegar         | Serce jest jak zegar | Ten przyrząd to zegar | Nożyczki są jak zegar |
| Maniery to garnitur    | Maniery są jak garnitur | To ubranie to garnitur | Chodnik to garnitur |
| Jej garderoba to kaplica | Jej garderoba jest jak kaplica | Ten budynek to kaplica | Piasek to kaplica |
| Rozpacz to powódź      | Rozpacz jest jak powódź | To zjawisko to powódź | Strzelba jest jak powódź |
| Jego mięśnie to ciasto | Jego mięśnie są jak ciasto | Ten deser to ciasto | Bluzka jest jak ciasto |
| Rodzeństwo to wagon    | Rodzeństwo jest jak wagon | Ten magazyn to wagon | Drzwi są jak wagon |
| Rozwód to pogrzeb      | Rozwód jest jak pogrzeb | Ten rytuał to pogrzeb | Stopa jest jak pogrzeb |
| Jej figura to cegła    | Jej figura jest jak cegła | Ten materiał to cegła | Szklanka jest jak cegła |
| Piec to żołądek        | Piec jest jak żołądek | Ten organ to żołądek | Robak jest jak żołądek |
| Uśmiech to sztandar    | Uśmiech jest jak sztandar | Ten znak to sztandar | Łyżka to sztandar |
| Ten docinek to pocisk  | Ten docinek jest jak pocisk | Ta kulka to pocisk | Okno jest jak pocisk |
| Wiedza to laska        | Wiedza jest jak laska | Ten rekwizyt to laska | Kapsel jest jak laska |
| Emerytura to ławka     | Emerytura jest jak ławka | Ta deska to ławka | Widły są jak ławka |
| Młodość to zajac       | Młodość jest jak zajac | To zwierzę to zajac | Ręcznik jest jak zajac |
| Zakochanie to cukier   | Zakochanie jest jak cukier | Ten towar to cukier | Armia to cukier |
| Kac to pustynia        | Kac jest jak pustynia | Ten obszar to pustynia | Pomadka jest jak pustynia |
| Opinia to flaga        | Opinia jest jak flaga | Ten symbol to flaga | Taczka jest jak flaga |
| Autostrada to taśma    | Autostrada jest jak taśma | To wykończenie to taśma | Siodło to taśma |
| Pożyczka to karetki    | Pożyczka jest jak karetki | Ten samochód to karetki | Ramka to karetki |
| Novel nominal metaphors | Novel similes | Literal sentences | Anomalous sentences |
|-------------------------|--------------|------------------|--------------------|
| Akcent to pamiętka     | Akcent jest jak pamiętka | Ten wiśorek to pamiętka | Gardło to pamiętka |
| Klopoty to chmura       | Klopoty są jak chmura    | Ten widok to chmura    | Szylnka jest jak chmura |
| Kołyska to gniazdo      | Kołyska jest jak gniazdo | Ta konstrukcja to gniazdo | Zakładka to gniazdo |
| Krytyka to karabin      | Krytyka jest jak karabin | Ta broń to karabin     | Tama to karabin      |
| Ta widownia to zwłoki   | Ta widownia jest jak zwłoki | Ten dowód to zwłoki   | Dzida to zwłoki      |
| Jej młodsza siostra to mucha | Jej młodsza siostra jest jak mucha | To stworzenie to mucha | Łopata jest jak mucha |
| Ten grubas to jajko     | Ten grubas jest jak jajko | Ten posiłek to jajko   | Puder to jajko       |
| Muzyka to zabawka       | Muzyka jest jak zabawka  | Ten prezent to zabawka | Tajfun to zabawka    |
| Ten naród to stado      | Ten naród jest jak stado | Ta gromada to stado    | Zapałka jest jak stado |
| Psycholog to kapłan     | Psycholog jest jak kapłan | Ten mężczyzna to kapłan | Przewód do kapłan    |
| Ta fryzura to rzeźba    | Ta fryzura jest jak rzeźba | Ta dekoracja to rzeźba | Walizka to rzeźba    |
| Ta dziewczyna to pióro  | Ta dziewczyna jest jak pióro | Ten przedmiot to pióro | Kurtka to pióro      |
| Intelekt to miśienia    | Intelekt jest jak miśienia | To wybrzuszenie to miśienia | Beczka to miśienia  |
| Słowo to farba          | Słowo jest jak farba     | Ta ciecz to farba      | Pierścienie jest jak farba |
| Plotka to iskra         | Plotka jest jak iskra    | Ten błysk to iskra     | Gałka to iskra       |
| Rozum to świątynia      | Rozum jest jak świątynia | Ta budówka to świątynia | Podeszwa jest jak świątynia |
| Jego głowa to ziemniak  | Jego głowa jest jak ziemniak | To warzywo to ziemniak | Balsam jest jak ziemniak |
| Wiara to przewodnik     | Wiara jest jak przewodnik | Ta osoba to przewodnik | Słoik jest jak przewodnik |
| Pies to badacz          | Pies jest jak badacz     | Ta postać to badacz    | Grzejnik jest jak badacz |
| Blizny to pamiętnik     | Blizny są jak pamiętnik  | Ten egzemplarz to pamiętnik | Młot jest jak pamiętnik |
| Rodzina to korzeń       | Rodzina jest jak korzeń  | Ten badyl do korzeń    | Łódówka jest jak korzeń |
| Poród to bitwa          | Poród jest jak bitwa     | Ta demonstracja to bitwa | Wstążka to bitwa     |
| Umysł to pracownia      | Umysł jest jak pracownia | Ten pokój do pracownia | Kalafior jest jak pracownia |
| Podświadomość to anioł   | Podświadomość jest jak anioł | Ta figura to anioł     | Pisak to anioł       |
| Wanna to basen          | Wanna jest jak basen     | Ten zbiornik do basen   | Koc jest jak basen    |
|    | Novel nominal metaphors          | Novel similes           | Literal sentences          | Anomalous sentences          |
|----|---------------------------------|-------------------------|----------------------------|-----------------------------|
| 78 | Pulpit komputera to biurko      | Pulpit komputera jest jak biurko | Ten starość to biurko      | Lalka jest jak biurko        |
| 79 | Nienawiść to błoto              | Nienawiść jest jak błoto | Ta kałuża to błoto         | Ten baran to błoto          |
| 80 | Jej grube włosy to czapka       | Jej grube włosy są jak czapka | Ten upominek to czapka     | Banan to czapka             |
| 81 | Artysta to dowódca              | Artysta jest jak dowódca | Jego dziadek to dowódca    | Chusteczka jest jak dowódca |
| 82 | Ta technologia to dzieciak      | Ta technologia jest jak dzieciak | Ten chłopiec to dzieciak   | Pineska jest jak dzieciak   |
| 83 | Samoностью to dziura            | Samoностью jest jak dziura | Ta pułapka to dziura       | Ta ciężarówka to dziura     |
| 84 | Przyjaźń to imperium             | Przyjaźń jest jak imperium | To mocarstwo to imperium   | Ta zasłona to imperium      |
| 85 | Parasol to kapelusz             | Parasol jest jak kapelusz | Ta rzecz to kapelusz       | Czekolada jest jak kapelusz |
| 86 | Dobry film to kawa              | Dobry film jest jak kawa | Ten proszek to kawa        | Opona jest jak kawa         |
| 87 | Małość do kregosłup             | Małość jest jak kregosłup | Te kości do kregosłup      | Ta patelnia do kregosłup    |
| 88 | Fryzjerka to królowa             | Fryzjerka jest jak królowa | Ta pszczoła do królowa      | Ta pracownica do królowa    |
| 89 | Izolacja to kurtka              | Izolacja jest jak kurtka | To odzienie do kurtka      | Te łyżwy do kurtka          |
| 90 | Ten poradnik do lekarstwo       | Ten poradnik jest jak lekarstwo | Ten płyn do lekarstwo      | Ta choinka do lekarstwo     |
| 91 | Jego komentarz do lektura       | Jego komentarz jest jak lektura | Ten dramat do lektura      | Prąd jest jak lektura       |
| 92 | Dzień do ląka                   | Dzień jest jak ląka      | Ta przestrzeń do ląka      | Firanina do ląka            |
| 93 | Dwina do morderca               | Dwina jest jak morderca  | Ten nastolatek do morderca | Pianka do morderca          |
| 94 | Ten płaszczy do namiot          | Ten płaszczy jest jak namiot | Ich baza do namiot         | Ten balet jest jak namiot   |
| 95 | Dziecko do obrazek              | Dziecko jest jak obrazek | To dzieło do obrazek       | Dziurkacz do obrazek        |
| 96 | Pieniądze do paliwo             | Pieniądze są jak paliwo | Ta substancja do paliwo    | Ten dokument do paliwo      |
| 97 | Ta uwaga do pistolet            | Ta uwaga jest jak pistolet | Ten eksponat do pistolet   | Bombka do pistolet          |
| 98 | Jej bagażnik do piwnica         | Jej bagażnik jest jak piwnica | To schronienie do piwnica | Ta smycz jest jak piwnica   |
| 99 | Jej szept do poduszka           | Jej szept jest jak poduszka | To podparcie do poduszka   | Ołówek jest jak poduszka    |
|100 | Telefon komórkowy do portfel    | Telefon komórkowy jest jak portfel | Ta niespodzianka do portfel | Śnieg jest jak portfel       |
|101 | Budzik do porucznika            | Budzik jest jak porucznik | Ten obywateł porucznik     | Teczka do porucznika        |
|102 | Encyklopedia do posilek         | Encyklopedia jest jak posilek | Ta nagroda do posilek      | Ten autobus do posilek      |
| Novel nominal metaphors         | Novel similes                  | Literal sentences             | Anomalous sentences         |
|--------------------------------|--------------------------------|--------------------------------|----------------------------|
| 103 Etyka to prawnik           | Etyka jest jak prawnik         | Ta kobieta to prawnik         | Ten renifer to prawnik      |
| 104 Studia to przedszkole      | Studia są jak przedszkole      | Ten gmach to przedszkole      | Ta herbata jest jak przedszkole |
| 105 Internet to przychodnia    | Internet jest jak przychodnia  | Ta kamienica to przychodnia   | Ta opaska jest jak przychodnia |
| 106 Ta konferencja to przystanek | Ta konferencja jest jak przystanek | Ten słup do przystanek       | Koczyk to przystanek       |
| 107 Ten kraj to puszka         | Ten kraj jest jak puszka       | Ten pojemnik to puszka        | Ta maskotka to puszka       |
| 108 Motywacja to silnik        | Motywacja jest jak silnik      | To urządzenie to silnik       | Ten sweter jest jak silnik  |
| 109 Narty to skrzydła          | Narty są jak skrzydła          | Te elementy to skrzydła       | Wizytówki to skrzydła       |
| 110 Humanista to słownik       | Humanista jest jak słownik     | Ten tom to słownik            | Ta skarpetka jest jak słownik|
| 111 Małżeństwo to spacer       | Małżeństwo jest jak spacer     | Ta czynność to spacer         | Konewka jest jak spacer     |
| 112 Jego dłonie to stolik      | Jego dłonie są jak stolik      | Ten antyk to stolik           | Ocean to stolik             |
| 113 Planeta to talerz          | Planeta jest jak talerz        | To znalezisko archeologiczne to talerz | Piłkarz jest jak talerz |
| 114 Absolutorium to wesele     | Absolutorium jest jak wesele   | Ta impreza to wesele          | Szczotka jest jak wesele    |
| 115 Autorytet to wieża         | Autorytet jest jak wieża       | Ten maszt to wieża            | Ten notatnik to wieża       |
| 116 Klótnia to wybuch          | Klótnia jest jak wybuch        | Ten hałas to wybuch           | Ta siatka jest jak wybuch   |
| 117 Ta powieść to wykład       | Ta powieść jest jak wykład     | Te zajęcia to wykład          | Kapitan to wykład           |
| 118 Stypendium to wzgórze       | Stypendium jest jak wzgórze    | Ten peężaż to wzgórze          | Pociąg to wzgórze            |
| 119 Ten egzamin to zamach       | Ten egzamin jest jak zamach    | To wydarzenie to zamach       | Krem to zamach              |
| 120 Komputer to zeszyt         | Komputer jest jak zeszyt       | Ten kalendarz to zeszyt       | Trampki są jak zeszyt       |
# Appendix 2

See Table 10.

| Table 10  | English stimuli |
|-----------|----------------|
|           | Novel nominal metaphors | Novel similes | Literal sentences | Anomalous sentences |
| 1         | A house is a harbour  | A house is like a harbour | This area is a harbour | This banana is like a harbour |
| 2         | The past is an anchor | The past is like an anchor | This chain is an anchor | A shampoo is like an anchor |
| 3         | Motivation is an engine | Motivation is like an engine | This machine is an engine | A frog is like an engine |
| 4         | Hope is a candle | Hope is like a candle | This wax is a candle | A cactus is a candle |
| 5         | Conversations are bridges | Conversations are like bridges | These connections are bridges | Cherries are like bridges |
| 6         | My head is a basket | My head is like a basket | This box is a basket | Champagne is a basket |
| 7         | Phobia is an enemy | Phobia is like an enemy | This politician is an enemy | A tomato is like an enemy |
| 8         | My mother is an elephant | My mother is like an elephant | This animal is an elephant | A dress is an elephant |
| 9         | My cat is a singer | My cat is like a singer | This lady is a singer | A broccoli is like a singer |
| 10        | Her words are jewellery | Her words are like jewellery | These stones are jewellery | A storm is jewellery |
| 11        | My lover is candy | My lover is like candy | This snack is candy | A doormat is like candy |
| 12        | Disability is a label | Disability is like a label | This piece of paper is a label | A garage is a label |
| 13        | A lie is a curtain | A lie is like a curtain | This material is a curtain | A sausage is like a curtain |
| 14        | A smile is a sweetener | A smile is like a sweetener | This caramel is a sweetener | A shark is a sweetener |
| 15        | His voice is a lullaby | His voice is like a lullaby | This song is a lullaby | This tiger is like a lullaby |
| 16        | Her neck is a tower | Her neck is like a tower | This pile is a tower | A pigeon is like a tower |
| 17        | A migraine is a kidnapper | A migraine is like a kidnapper | This teenager is a kidnapper | That potato is a kidnapper |
| 18        | Failures are bruises | Failures are like bruises | These marks are bruises | Bottles are like bruises |
| 19        | A fridge is a pocket | A fridge is like a pocket | This hole is a pocket | A vitamin is a pocket |
| 20        | Praise is a reward | Praise is like a reward | This medal is a reward | A finger is like a reward |
| 21        | Details are buttons | Details are like buttons | These fasteners are buttons | These knives are buttons |
| 22        | Religion is a watcher | Religion is like a watcher | An observer is a watcher | A cabbage is like a watcher |
| Novel nominal metaphors | Novel similes | Literal sentences | Anomalous sentences |
|------------------------|--------------|------------------|--------------------|
| 23 This company is a toddler | This company is like a toddler | My sister is a toddler | Pasta is a toddler |
| 24 His decision is a bullet | His decision is like a bullet | This metal projectile is a bullet | Dust is like a bullet |
| 25 Truth is a washer | Truth is like a washer | This facecloth is a washer | Cheese is a washer |
| 26 This lecture is a prayer | This lecture is like a prayer | My wish is a prayer | A mushroom is like a prayer |
| 27 Loneliness is a cavity | Loneliness is like a cavity | A crater is a cavity | A postcard is a cavity |
| 28 Apologies are stitches | Apologies are like stitches | These threads are stitches | Airports are like stitches |
| 29 Music is sugar | Music is like sugar | This sweetener is sugar | An elbow is sugar |
| 30 Support is a charger | Support is like a charger | This device is a charger | Her towel is like a charger |
| 31 Skyscrapers are chimneys | Skyscrapers are like chimneys | These ventilators are chimneys | Gingerbreads are chimneys |
| 32 A kiss is honey | A kiss is like honey | This syrup is honey | A curtain is like honey |
| 33 Protection is a blanket | Protection is like a blanket | This cloth is a blanket | Chocolate is a blanket |
| 34 Pessimism is an acid | Pessimism is like an acid | This substance is an acid | A station is like an acid |
| 35 My wardrobe is a temple | My wardrobe is like a temple | A holy place is a temple | That dolphin is a temple |
| 36 A pet store is an orphanage | A pet store is like an orphanage | This institution is an orphanage | Rice is like an orphanage |
| 37 These classrooms are gardens | These classrooms are like gardens | These grounds are gardens | Salmons are gardens |
| 38 Success is a summit | Success is like a summit | This peak is a summit | This magazine is like a summit |
| 39 University is a factory | University is like a factory | This establishment is a factory | This duck is a factory |
| 40 Psychotherapies are surgeries | Psychotherapies are like surgeries | These medical procedures are surgeries | Peaches are like surgeries |
| 41 Alcoholics are prisoners | Alcoholics are like prisoners | These villains are prisoners | These suitcases are prisoners |
| 42 Ambition is a mountain | Ambition is like a mountain | This hill is a mountain | A butcher is a mountain |
| 43 Achievement is a ceiling | Achievement is like a ceiling | This surface is a ceiling | A diary is a ceiling |
| 44 God is an accuser | God is like an accuser | This man is an accuser | An iron is like an accuser |
| 45 Legends are whispers | Legends are like whispers | These murmurs are whispers | Watermelons are whispers |
| 46 Language is a currency | Language is like a currency | This cash is a currency | Rats are a currency |
| 47 Bars are churches | Bars are like churches | These monuments are churches | Lips are like churches |
| Novel nominal metaphors          | Novel similes                | Literal sentences          | Anomalous sentences     |
|---------------------------------|------------------------------|----------------------------|-------------------------|
| A shopaholic is a hunter        | A shopaholic is like a hunter| His brother is a hunter    | A glove is a hunter     |
| Cafes are offices               | Cafes are like offices       | These studios are offices  | Kangaroos are like offices|
| This feminist is a lioness      | This feminist is like a lioness| This creature is a lioness | A vase is a lioness     |
| Skills are tickets              | Skills are like tickets      | These items are tickets    | Giraffes are like tickets|
| Trees are fingers               | Trees are like fingers       | These bones are fingers    | Doors are fingers       |
| The Internet is a chamber       | The Internet is like a chamber| This corridor is a chamber | A strawberry is like a chamber|
| A mosquito is a refugee         | A mosquito is like a refugee | This rebel is a refugee    | Coffee is a refugee     |
| Eyes are windows                | Eyes are like windows        | These screens are windows  | These pigs are like windows|
| This lake is a mirror           | This lake is like a mirror   | This glass is a mirror     | This breakfast is a mirror|
| My thoughts are a liquid        | My thoughts are like a liquid| This fluid is a liquid     | A cheek is like a liquid|
| Her hairdo is a sculpture       | Her hairdo is like a sculpture| This wood is a sculpture   | A sheet is a sculpture  |
| Knowledge is luggage            | Knowledge is like luggage    | These belongings are luggage| Hail is like luggage    |
| Acrobats are spiders            | Acrobats are like spiders    | These insects are spiders  | Cows are spiders        |
| Bacteria are fighters           | Bacteria are like fighters   | These boxers are fighters  | Gifts are like fighters |
| Government is a parent          | Government is like a parent  | My father is a parent      | A tram is a parent      |
| Conflicts are scissors           | Conflicts are like scissors  | These instruments are scissors| Plums are like scissors |
| Grandparents are libraries      | Grandparents are like libraries| These book collections are libraries| Knees are libraries |
| A dream is a river              | A dream is like a river      | This stream is a river     | An owl is like a river  |
| This battlefield is a funeral   | This battlefield is like a funeral| This celebration is a funeral| A monkey is a funeral  |
| Adoption is a wedding           | Adoption is like a wedding   | This ceremony is a wedding | This conditioner is like a wedding|
| Forgiveness is a cookie         | Forgiveness is like a cookie | A tasty thing is a cookie  | A couch is a cookie     |
| A hug is a jacket               | A hug is like a jacket       | This piece of clothing is a jacket| A beetroot is like a jacket|
| Viruses are travellers          | Viruses are like travellers  | These people are travellers| Tables are travellers   |
| That boat is a coffin           | That boat is like a coffin   | This casket is a coffin    | A lunch is like a coffin|
| Security is a chapel            | Security is like a chapel    | This sanctuary is a chapel | This camel is a chapel  |
| Novel nominal metaphors | Novel similes | Literal sentences | Anomalous sentences |
|-------------------------|---------------|------------------|--------------------|
| Loans are cages         | Loans are like cages | These enclosures are cages | Flowers are like cages |
| A bedroom is a kingdom  | A bedroom is like a kingdom | This country is a kingdom | A paperclip is a kingdom |
| The brain is a container| The brain is like a container | This bucket is a container | Forks are like a container |
| Guns are judges         | Guns are like judges | His cousins are judges | Earphones are like judges |
| My heart is a drawer    | My heart is like a drawer | This piece of furniture is a drawer | A bug is a drawer |
| Poetry is cotton        | Poetry is like cotton | This fiber is cotton | A peacock is like cotton |
| Her soul is a boulder   | Her soul is like a boulder | This rock is a boulder | A napkin is a boulder |
| Networks are forests    | Networks are like forests | These plantations are forests | Ties are like forests |
| My room is a castle     | My room is like a castle | This big building is a castle | A dot is a castle |
| Determination is a ladder| Determination is like a ladder | This equipment is a ladder | A bee is like a ladder |
| A photograph is a diary | A photograph is like a diary | This blog is a diary | A hamster is a diary |
| Businessmen are wallets | Businessmen are like wallets | These purses are wallets | These cakes are like wallets |
| Calmness is an angel    | Calmness is like an angel | This figure is an angel | Mold is an angel |
| Beliefs are anthems     | Beliefs are like anthems | These melodies are anthems | These trousers are like anthems |
| Lifetime is a movie     | Lifetime is like a movie | This drama is a movie | Snow is a movie |
| Problems are wrinkles   | Problems are like wrinkles | These lines are wrinkles | Blankets are like wrinkles |
| Criticism is a freezer  | Criticism is like a freezer | This cooler is a freezer | A pineapple is a freezer |
| Prejudice is a poison   | Prejudice is like a poison | This liquid is a poison | A planet is like a poison |
| Memory is a muscle      | Memory is like a muscle | This tissue is a muscle | This cauliflower is a muscle |
| This car is an oven     | This car is like an oven | This appliance is an oven | A notebook is like an oven |
| Peace is a healer       | Peace is like a healer | This person is a healer | This handbag is a healer |
| Children are parrots    | Children are like parrots | These birds are parrots | Lollipops are like parrots |
| Alcohol is the devil    | Alcohol is like the devil | This supernatural entity is the devil | A leaf is the devil |
| Tears are a lesson      | Tears are like a lesson | This seminar is a lesson | A fox is like a lesson |
| Critics are razors      | Critics are like razors | These blades are razors | Chickens are razors |
| Novel nominal metaphors | Novel similes | Literal sentences | Anomalous sentences |
|-------------------------|--------------|------------------|--------------------|
| The ocean is a carpet   | The ocean is like a carpet | That covering is a carpet | A butterfly is like a carpet |
| The skull is a helmet   | The skull is like a helmet | This safety hat is a helmet | A sofa is like a helmet |
| Laziness is a rebel     | Laziness is like a rebel | That soldier is a rebel | This flowerpot is like a rebel |
| Disease cells are burglars | Disease cells are like burglars | These men are burglars | These socks are burglars |
| Conscience is a preacher| Conscience is like a preacher | That individual is a preacher | A blueberry is like a preacher |
| Experience is an adviser| Experience is like an adviser | A psychologist is an adviser | A bus is an adviser |
| The gas tank is a stomach | The gas tank is like a stomach | This organ is a stomach | This horse is like a stomach |
| His dog is a scientist | His dog is like a scientist | Her uncle is a scientist | A pumpkin is a scientist |
| His letters are sermons | His letters are like sermons | These talks are sermons | Spoons are sermons |
| A model is a needle     | A model is like a needle | This object is a needle | Jogging is like a shadow |
| Medicines are wrestlers | Medicines are like wrestlers | These sportsmen are wrestlers | Fridge is a weapon |
| This ballad is a pillow | This ballad is like a pillow | A cushion is a pillow | These carrots are like wrestlers |
| A model is a needle     | A model is like a needle | This object is a needle | The sky is a needle |
| Medicines are wrestlers | Medicines are like wrestlers | These sportsmen are wrestlers | These carrots are like wrestlers |
| His approval is a salary | His approval is like a salary | This payment is a salary | A cockroach is like a salary |
| This corporation is an onion | This corporation is like an onion | This ingredient is an onion | This canary is an onion |
| Friendship is a shelter | Friendship is like a shelter | This cave is a shelter | An ant is like a shelter |
| Earnings are badges     | Earnings are like badges | These trademarks are badges | Ladybirds are badges |
| Chromosomes are siblings | Chromosomes are like siblings | These girls are siblings | Bikes are like siblings |
| Imagination is an inventor | Imagination is like an inventor | This scholar is an inventor | This balloon is an inventor |
| Grudge is a tumour      | Grudge is like a tumour | This growth is a tumour | A daffodil is like a tumour |
| Rumours are runners     | Rumours are like runners | These athletes are runners | Suits are runners |
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