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# WORD PALINDROME: A TRANSLINGUAL PERSPECTIVE ON STRUCTURAL DIVERSITY

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**Abstract:** The present paper delves into the remarkably diverse yet highly intricate fabric of palindromicity from a translingual perspective. A seemingly simplistic reversibility pattern underlying the formation of prototypical palindromes yields a multitude of discrete typologies that are constructed upon different criteria and yet exploit homolingual language material in each case. Revisiting the extensive yet fragmented theoretical framework and reexamining the empirical evidence from a number of structurally similar and dissimilar languages allows for creating an integrative typology of word palindromes applicable to the overwhelming majority of world languages, irrespective of their phonemic, graphemic, syllabemic, morphemic, or lexemic idiosyncrasies.

**Key words:** palindrome, word palindrome, structure, typology, wordplay.

## 1. Introduction

Wordplay, which appears as old as language itself, constitutes a form of intelligent humour aimed at entertainment, education, or promotion. Miscellaneous manipulations with phonological, graphical, lexical, morphological, syntactic, and stylistic language material increase language awareness, boost a sense of self-identity and self-alterity, celebrate reasoning over rationality, introduce novelty, and embody protest against socially imposed patterns. Amidst the numerous varieties of wordplay thriving within and across different language traditions and backgrounds, palindromy ranks as one of the most consummate and masterful, reflecting the pinnacle of ludolinguistic creativity. The anacyclic nature of the phenomenon coupled with its bidirectionality and symmetry endows it with algebraic formulaicity and geometric proportion.

Palindromes possess a bimillennial history and are detected in diverse modern and ancient languages all over the globe. Yet, all previous research into the logological phenomenon was confined to studies of individual languages (i.e. addressing homolingual material), with no attempt being made so far to theoretically approach palindromy from a translingual perspective (i.e. involving heterolingual material). The aim of this paper is, therefore, to provide a detailed translingual account of word palindromy, based on lexical evidence from over 100 structurally similar and dissimilar languages, both historically related and unrelated.

In particular, this study seeks to address four fundamental research questions:
1) elaborating the definition of ***palindrome*** in general and ***word palindrome*** in particular as applicable to multilingual logological material;
2) identifying and structuring the basic types of word palindromes across different languages;
3) integrating the existing types of palindromes and structurally comparable linguistic phenomena of indeterminate status with the newly delimited types of word palindromes;
4) designing a comprehensive translingual typology spanning word palindromy in structurally similar and dissimilar languages.

## 2. Theoretical framework

### *2.1 Etymology and origins*

The preliminary clue to understanding the term ***palindrome*** is disguised in its etymology per se. The word consists of two Greek lexemes, *πάλιν* 'again, backwards' and *δρόμος* 'course', which, when coupled (*παλίνδρομος*), roughly translate as 'running again' (Klein 2003: 528). Curiously enough, Greeks themselves prefer other denominations of the phenomenon, namely *καρκινική γραφή*, literally 'crab(-like) writing', and *καρκινική επιγραφή*, literally 'crab(-like) inscription'. The motivation behind these native terms reflects the figurative visual correlation between sideways crab locomotion, on the one hand, and element-by-element reversible readability, on the other, both transcending the boundaries of prototypical forward gait and one-direction reading respectively. In this regard, it bears recalling the terminology introduced by the 18th-century Ukrainian poet Ivan Velychkovskyi, who discriminated between *рак літеральный* (*rak literalnyi*; literally 'letter crab', referring to a palindrome reversible letter by letter), *рак словный* (*rak slovnyi*; literally 'word crab', referring to a palindrome reversible word by word), and *рак прекословный* (*rak prekoslovnyi*; literally 'negatory crab', referring to an anacyclic poem which, when read backwards word by word, produces the opposite meaning) as the three types of palindromes (Velychkovskyi 1972: 73-74) (cf. the Latinistic term *cancrine verses* in English (Donner 1996: 69)).

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The term ***palindrome*** emerged in English back in 1638, introduced by the writer Henry Peacham: "[…] I caused this to be written over the porch of their free-schoole doore, *Subi dura a rudibus*: It is Palindrome, the letters making the same a-gaine backwards." (Peacham 1638: 123). The Latin inscription exemplifying the first mention of a palindrome under its present-day name makes perfect sense, serving as incontrovertible evidence of the then-rampant school abuse, and translates as 'Endure rough treatment from uncultured brutes'. The phenomenon, however, had existed for more than 1,500 years prior to being identified by its modern name that has become truly translingual.

Although a popular ludolinguistic joke has it that, in the Garden of Eden, Adam and Eve introduced themselves to each other, exchanging palindromes "Madam, I'm Adam!" and "Eve, man, am Eve!" respectively (Donner 1996: 12), it is the ancient Greek poet of the 3rd century BC Sotades (of Maroneia), aka Sotades the Maronite, Sotades the Obscene of Maronea, or Sotades of Thrace, who is generally credited with the invention of palindromes. He is believed to be the first literary writer of Sotadean poetry (whence its name), relying on the substitutability of the meter — — ◡ ◡ for the meter — ◡ — X in the stichic ionic verse — — ◡ ◡— — ◡ ◡— — ◡ ◡ — —, presumably even re-writing Homer's entire "Iliad" in Sotadean verse (Horne 2010: 11; Hunter 2012: 1386). Subsequent, historically recorded, examples of word and sentence palindromes are found in Latin (e.g., the Sator Square palindrome-acrostic *Sator Arepo tenet opera rotas*, writable, readable, and interpretable in a multitude of ways, as one of the 13,000 wall-inscriptions documented so far in the excavations at Pompeii (Benefiel 2013: 67-70)), Greek (e.g., *Νίψον ἀνομήματα, μὴ μόναν ὄψιν (Nipson anomēmata mē monan opsin)*, which means 'Wash away your sins, not only your face' (Yeroulanos 2016: 49), attributed to the 4th-century theologian Gregory of Nazianzus (Brogan & Getty 1993: 874)), Chinese (e.g., the classical reversible poem "Star Gauge" by the 4th-century poet Su Hui, embroidered on a piece of brocade in five colours and readable horizontally, vertically, and diagonally (Hinton 2008: 105-109)), Hebrew (e.g., the affirmative palindromic response by the 12th-century exegete and poet Abraham ibn Ezra to the question whether a fly landing in honey makes it not kosher *ונשרף נתבער שבדבש רעבתן פרשנו (perashnu: ra`avtan shebad'vash nitba`er venisraf)* 'We have explained that the glutton [fly] who is in the honey was burned and incinerated' (Geizhals & Sokol 2016: 19:2)), and other languages. Borgmann emphasizes that the archaic use of palindromes ultimately constitutes the mythic expression of cosmological symmetry and reflects the early psychology of magic, assuming the form of "the mythical, expressive beginnings of the palindrome as a language form, the magic squares which conceal the name of a deity, the recurrent verses from the Torah, and the traditional words of the Hebraic God to Moses" (Borgmann 1980: 92-93), which perfectly aligns with the examples from Latin, Greek, Chinese, and Hebrew provided above.

*2.2 Definition and disambiguation issues*

A palindrome has been defined in a number of ways by various scholars: **(1)** as a word that reads the same backwards as forwards (Brandreth 2015: 243); **(2)** as a line or phrase that reads the same backward as forward (Killikelly 1890: 317); **(3)** as a word, verse (a line of metrical writing), or sentence that reads the same backwards as forwards (Chism 1992: iii); **(4)** as a word, sentence, or verse which reads alike backward or forward, whether letter by letter or word by word (Brogan & Getty 1993: 874); **(5)** as a word, sentence, or longer piece of writing that spells the same thing if it is read backwards (Augarde 1994: 158); **(6)** as a recurrent, reciprocal, or reversible word or verse read backwards or forwards (Bombaugh 1961: 59); **(7)** as a word, phrase, or any other sequence of symbols that reads the same in either direction (Blake 2010: 14; Yıldız 2008: 57); **(8)** as any word, phrase, sentence, poem, number, etc. that is spelt the same forward and backward without regard to conventions such as punctuation, word spacing, and capitalization (Donner 1996: 263); **(9)** as a particular type of an anagram, i.e. a word or sentence that reads the same backward and forward (Danesi 2002: 49); **(10)** as a type of an anagram constituted by the inversion of segmental and intersegmental graphemes (Plett 2010: 258).

It is Donner who best outlined the intricate pattern underlying the very nature of a palindrome, defining the latter as "any word, phrase, sentence, poem, number, etc., […] whose letters (or digits) alone are so ordered as to repeat and redouble the original left-to-right text when read back in reverse from right to left with a comparable indifference toward *re*spacing, *re*punctuating, and *re*capitalizing!" (Donner 1996: 263-264).

The definitions provided above highlight diverse aspects of palindromes: 1) linguistic status (i.e. the scope of language units interpretable as palindromes); 2) formal and semantic bidirectionality (i.e. the ontological retention of form and meaning when read and/or spelt in either direction); 3) complete or partial reversibility (i.e. their readability and/or spellability backwards); 4) reversibility unit status (i.e. the range of regular language units or irregular language unit fragments/sequences underlying their readability and/or spellability backwards); 5) allowable metagraphemic loss (i.e. the omissibility of certain supragraphemic, syngraphemic, or topographemic elements that does not run counter to palindromicity).

From the perspective of literary rhetoric, a palindrome is regarded as a rhetoric figure of graphemic deviation, i.e. metagrapheme (as opposed to rhetoric figures of graphemic equivalence, i.e. isographemes). Metagraphemes are produced through addition, subtraction, permutation, and substitution, exploiting different combinations of segmental (letters) and intersegmental or


ISSN 2453-8035

suprasegmental (punctuation and diacritics) graphemes. It is permutation, or graphemic rearrangement that underlies the production of various anagrams, including a palindrome (Plett 2010: 253-275).

However, it is difficult to agree with a widespread yet obviously erroneous statement that a palindrome represents a specific case of an anagram (Danesi 2002: 49; De Marco 2025: 11; Friedman & Friedman 1957/2010: 93; Plett 2010: 258). Since letter rearrangement within a word (group) at the core of an anagram is intended to produce "a new word […], phrase, expression, or sentence" (Danesi 2002: 46), create "a new unit of meaning" (Plett 2010: 257) or "new meanings" (De Marco 2025: 10), or else "change some word or phrase into some other word or phrase by changing the order of its letters" (Friedman & Friedman 1957/2010: 92), a palindrome cannot qualify as an anagram. Although both anagrams and palindromes rely on the word-stock readily available in a specific language (with palindromes equally relying on the extensive use of proper names, occasionally non-existent in the language prior to their coinage by the palindromist, in order to partly compensate for their rigid pattern constraints dictated by the language fabric), anagrams undergo letter manipulation leading to the inevitable loss of their original form and meaning, whereas palindromes retain their graphically and/or phonologically full form and full meaning when read in either direction, which, consequently, brings them closer to isographemes.

In this regard, Bergerson distinguishes between palindromes with an even number of letters, which he identifies as anagrams, and palindromes with an odd number of letters, which he excludes from the class, owing to the presence of the centre letter (Bergerson 1973: vii-viii). This approach also appears controversial. Although the second half of a phrase, sentence, or verse palindrome does not generally coincide with the first, constituting its unit-by-unit reflection, a palindrome is regarded as semantically indivisible, with its form and meaning being fully retained when read in either direction.

Nor is it conclusive to claim that all palindromes are produced through permutation as graphemic rearrangement. The latter is irrelevant to homographic word palindromes (such as German *Lagerregal* 'storage rack' or Japanese *トマト (tomato)* 'tomato'), may comply with phrase and sentence palindromes (such as Danish *Du er Freud?* 'You are Freud?' or Irish *sonas sa nós* 'happiness in the habit'), and fully applies to heterographic word palindromes (such as Hungarian *szösz* /søs/ 'fluff' or French *enfant* /ɑ̃fɑ̃/ 'child').

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Another important question concerns the identification of the smallest language unit capable of qualifying as a palindrome. Borgmann claims, that "each letter of the alphabet is a palindrome" (Borgmann 1985: 6), which is obviously erroneous since palindromicity is based on sequentiality and bidirectionality, both being non-applicable to a single free-standing indivisible unit (such as a letter). According to Donner, simple, derived, and compound words or longer assemblages may be regarded as compound palindromes if they are fragmentable into series of palindromes, e.g., *reverses* (*rever* and *ses*) (Donner 1996: 74). As compound palindromes meet the sequentiality and bidirectionality criteria when decomposed, it is apparent that words may be further divisible into smaller elements, such as polygraphemes, as long as each of the units remains palindromic.

Considering all the above, in the present paper, I will construe a ***palindrome*** as a word, phrase, line, sentence, stanza, or text spellable and/or readable the same horizontally (forward/backward) or vertically (downward/upward) [depending on the script orientation in the language], with optional sensitivity to capitalization, diacritics, punctuation, and spacing, the reversibility unit being a phoneme, grapheme, syllabeme, polygrapheme, morpheme, lexeme, phrase, line, sentence, stanza, or text fragment. However, given the widespread lack of academic agreement on what can be regarded as a reversibility unit as well as on whether the segmentation pattern underlying reversibility is to be of regular (i.e. linguistic) or irregular (i.e. random) nature, it is crucial to differentiate between the **broader** and **narrower understandings of palindromy**. The former, **broader, understanding of palindromy** qualifies any items characterized by bidirectional spellability and/or readability as palindromes irrespective of the regularity or structural complexity of the reversibility unit. It is upon this approach that my subsequent structural typology of word palindromes hinges, incorporating structurally divisible units such as syllabemes, polygraphemes, morphemes, etc. as long as they meet the requirements of a formulable reversibility pattern as well as of bidirectionality. In other words, any linguistic unit sequence that is characterized by either regular or irregular but formulaic reversibility is regarded as a palindrome. In accordance with the latter, **narrower, understanding of palindromes**, the phenomenon exclusively applies to those items that comply with bidirectional spellability regardless of whether their readability is fully reversible or not.

Consequently, as the scope of the present paper is limited to word palindromes, a ***word palindrome*** will be defined as a word spellable and/or readable the same horizontally (forward/backward) or vertically (downward/upward) [depending on the script orientation in the language], with optional sensitivity to capitalization, diacritics, and spacing (the latter applies to compounds only), the reversibility unit being a phoneme, grapheme, syllabeme, polygrapheme, morpheme, or lexeme.

 ISSN 2453-8035

*2.3 Existing typologies*

Nowadays there exist several typologies of palindromes based on four basic criteria:

1) the linguistic status of the reversible unit: *letter-unit palindromes*, *digram/trigram-unit palindromes*, *syllable-unit palindromes*, *morpheme-unit palindromes*, *word-unit palindromes*, *phrase-unit palindromes*, *sentence-unit palindromes*, *line-unit palindromes*, *paragraph-unit palindromes*, *stanza-unit palindromes*, *poem-unit palindromes*, *story-unit palindromes*, and *essay-unit palindromes* (based on Bergerson 1973: vi-vii); *word or name palindromes* and *sentence or verse palindromes* (Borgmann 1985: 6); *palindromes-by-letters*, *palindromes-by-pairs*, and *palindromes-by-triples* (Etherin 2021: 139-141);

2) the number of letters in the palindrome: *1-letter palindromes* to *25-letter palindromes* (Borgmann 1985: 6-14); *odd-lettered palindromes* and *even-lettered palindromes* (Funt 1977: 232);

3) the phoneme-to-grapheme correspondence regularity level: *phonetic palindromes*, *non-phonetic palindromes*, and *phonetically reversible words* (although the latter are not recognized as palindromes) (Hall 2011: 290);

4) the mode of reversal: *palindromes reversed letter by letter* and *palindromes reversed word by word* (Brogan & Getty 1993: 874).

However, each of the typologies above was primarily designed upon the material of one language only. No previous approach offers a translingual perspective on palindromicity, considering the phonemic, graphemic, syllabemic, morphemic, and lexemic discrepancies between languages of different groups and families. The present research, therefore, seeks to critically examine and review the existing typologies in order to develop a translingual typology spanning word palindromicity in structurally similar and dissimilar languages, both historically related and unrelated.

## 3. Database and methodology

The database represents a selection of word palindromes extracted from two basic source lists in the multilingual web dictionary "Wiktionary": "Category: Palindromes by language" (PbL) and "Category: Reduplications by language" (RbL). The choice of addressing readymade Wiktionary lists instead of compiling them for each language on one's own was by no means random. Wiktionary features 8,248 approved languages, incorporating modern, dormant, and dead languages as well as language varieties with a controversial status (but qualifiable as languages according to some criteria). Processing an even remotely comparable number of languages (and a manifold greater number of texts in each) in search of a peripheral ludolinguistic phenomenon based on strict structural constraints proves physically impossible for any single human researcher. Yet, the independently collected evidence for each language opens up virtually infinite possibilities for a palindromist to

 ISSN 2453-8035

analyze translingual convergences and divergences in the phonemic, graphemic, syllabemic, morphemic, and lexemic aspects. The above ultimately results in linguisticizing the detected regularities and irregularities, which, in the present article, gives rise to a novel, translingual, structural typology of word palindromes.

For the purposes of sample representability and global coverage, the number of language families addressed amounts to 22 (as well as two isolates and one creole), the overall language count being 107. The exemplified language families are as follows: **1) Afro-Asiatic** (Amharic, Arabic, Assyrian Neo-Aramaic, Hebrew, Phoenician, Somali, Tigrinya, Ugaritic); **2) Algic** (Ojibwe); **3) Austroasiatic** (Khmer, Vietnamese); **4) Austronesian** (Brunei Malay, Central Bikol, Chuukese, Fijian, Indonesian, Malay, Mokilese, Palauan, Rapa Nui, Samoan); **5) Cariban** (Ye'kwana); **6) Dravidian** (Malayalam, Tamil, Telugu); **7) Eskaleut** (Greenlandic, Inuktitut); **8) Indo-European** (featuring such language groups as *Albanoid* (Albanian); *Armenian*; *Baltic* (Latvian, Lithuanian); *Celtic* (Breton, Cornish, Irish); *Germanic* (Afrikaans, Danish, Dutch, English, Faroese, German, North Frisian, Norwegian, Old English, Swedish, Yiddish); *Hellenic* (Ancient Greek, Modern Greek); *Indo-Iranian* (Assamese, Bengali, Gujarati, Hindi, Marathi, Odia, Pashto, Persian, Prakrit, Prasun, Punjabi, Sanskrit, Sinhala, Zaza); *Romance* (French, Italian, Latin, Occitan, Old French, Old Galician-Portuguese, Portuguese, Romanian, Spanish); *Slavic* (Bulgarian, Czech, Polish, Slovak, Slovene, Ukrainian)); **9) Iroquoian** (Cherokee); **10) Japonic** (Japanese, Okinawan); **11) Kartvelian** (Georgian, Svan); **12) Koreanic** (Jeju, Korean); **13) Kra–Dai** (Lao, Thai); **14) Mayan** (Tzotzil, Yucatec Maya); **15) Mongolic** (Mongolian); **16) Niger-Congo** (Lingala, Xhosa, Yoruba, Zulu); **17) Oto-Manguean** (Zacatepec Chatino); **18) Quechuan**; **19) Sino-Tibetan** (Chinese, Lhasa Tibetan); **20) Tupian** (Guaraní, Old Tupi); **21) Turkic** (Azerbaijani, Crimean Tatar, Turkish); **22) Uralic** (Estonian, Finnish, Hungarian). In addition to the above, the two language isolates under study include Ainu and Sumerian. The only example of creoles featured is Tok Pisin. The list is thus confined to natural languages exclusively, with intentionally constructed languages falling beyond the scope of this research.

The present article employs an integrative methodology of investigating structural palindrome reversibility, based on interplay between phonemic, graphemic, syllabemic, and morphemic analyses, each aimed at decomposing the lexical evidence collected into operational units of a specific level (phonemes, graphemes, syllabemes, and morphemes in their regular as well as irregular combinations). It is the usage of this integrative methodology that paved the way for the elaboration of a novel, translingual, structural typology of word palindromes.

## 4. Results and discussion

The **structural typology of word palindromes** designed in this paper allows for differentiation between ***phonemically reversible***, ***graphemically reversible***, ***phonographemically reversible***, ***syllabemically reversible***, ***polygraphemically reversible***, ***morphemically reversible***, and ***lexemically reversible word palindromes***.

A ***phonemically reversible word palindrome*** (aka a ***phonetic palindrome*** (Thorpe 2011)) is a word readable the same horizontally (forward/backward) or vertically (downward/upward), the reversibility unit being a phoneme. In these palindromes, homophonic by default, the pronunciation is reversible while the spelling is not, e.g., Breton *tad* /tɑːt/ 'father', Czech *pochop* /poxop/ 'warrant officer', Dutch *pub* /pʏp/ 'pub', English *cork* /kɔːk/, French *veuve* /vœv/ 'widow', Greek *σοφός* /sofos/ 'wise', Hungarian *szakasz* /sɒkɒs/ 'stage', Old French *soz* /sus/ 'under', Polish *Czecz* /t͡ʂɛt͡ʂ/ 'Chech (region)', and Slovene *tọ̄d* /tóːt/ 'thus'.

A ***graphemically reversible word palindrome*** is a word spellable the same horizontally (forward/backward) or vertically (downward/upward), the reversibility unit being a grapheme. These palindromes are homographic by their nature, i.e. the spelling is reversible whereas the pronunciation is not, e.g., Afrikaans *soos* /sʊəs/ 'like', Arabic ديفيد *(dayfīd)* /dajfiːd/ 'David', Danish *glassalg* /glassalˀj/ 'glass sales', Dutch *droomoord* /droːmoːrt/ 'place of dreams', English *deified* /diːɪfaɪd/, Faroese *óró* /ɔuːɹɔuːw/ 'restlessness', German *Reittier* /ʁaɪ̯ttiːɐ̯/ 'a mount (animal)', Greek *άψα* /apsa/ 'irritability', Italian *ingegni* /ind͡ʒeɲɲi/ 'ingeniousnesses', Norwegian *skoboks* /skuːbɔks/ 'shoebox', Occitan *cèc* /sɛk/ 'blind', Old English *ġiċċiġ* /jitt͡ʃij/ 'itchy', Old French *Ecoce* /eːkot͡sə/ 'Scotland', Pashto ډډ *(dëḍ)* /d̪əɭd̪/ 'pain', Persian گرگ *(gorg)* /gurg/ 'wolf', Phoenician 𐤍𐤄𐤍 *(nḥn)* /naḥnu/ 'we', Polish *zaraz* /zaras/ 'at once, immediately', Portuguese *osso* /osu/ 'bone', Ye'kwana *öju'jö* /əhuʔhʷə/ 'seed', Yoruba *ọmọ* /ɔmɔ̃/ 'child', Zacatepec Chatino *naʔan* /na.ʔã/ 'house'.

A ***phonographemically reversible word palindrome*** is a word both spellable and readable the same horizontally (forward/backward) or vertically (downward/upward), the reversibility unit being a regular phoneme-to-grapheme correspondence, e.g., Bulgarian *отказто (otkakto)* 'ever since', Estonian *öötöö* 'night work', Fijian *ivi* 'Polynesian chestnut', Finnish *autioitua* 'to become deserted', Georgian *როგორ (rogor)* 'how', Greenlandic *qaqqaq* 'mountain', Guaraní *yvy* 'land', Lao ນອນ *(nōn)* 'to sleep', Latvian *skābāks* 'sourer', Lithuanian *ugnìngu* 'fiery (instrumental masculine singular)', North Frisian *weew* 'to weave', Norwegian *rør* 'stir (imperative)', Ojibwe *wa'aw* 'this', Old Galician-Portuguese *augua* 'water', Palauan *melalem* 'to plant', Prasuni *ügü* 'finger', Quechua *yañay* 'experimentation', Rapa Nui *aka* 'root', Romanian *atâta* 'so much', Slovak *krk* 'neck', Somali *diid*


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'refuse', Spanish *reconocer* 'to recognize', Svan *ჯიჯ (čač)* 'kidney', Tok Pisin *abababa* 'bubblegum', Turkish *küçük* 'small', Tzotzil *'a'* 'water', Xhosa *izazi* 'experts', Yiddish סאָס *(sos)* 'sauce', Yucatec Maya *juuj* 'iguana', Zazaki *gılılıg* 'cornea', Zulu *ibibi* 'heap of rubbish'.

From the narrowest perspective on palindromy, graphemically and phonographemically reversible palindromes constitute ***palindromes proper*** (thus representing the narrower understanding of palindromy), as they are visually perfectly symmetrical. The visual criterion, however, proves to be a treacherous one to solely rely upon.

The first consideration to be taken into account boils down to the visual discrepancies between uppercase and lowercase letters in bicameral alphabets (such as the Armenian, Cyrillic, Greek, or Latin scripts). Among the latter, the Armenian, Greek, and Latin alphabets reveal substantial discrepancies between the representation of the majority of uppercase and lowercase letters, as perfectly illustrated by the following phonographemically reversible but visually non-reversible palindromes: Armenian *Ագա (Aga)* 'Aga (river)', *Անան (Anna)* 'Anna (a female name)', *Արա (Ara)* 'Ara (a male name)', *Ակռա* (Ak'k'a) 'Acre (city)', *Նաթան (Nat'an)* 'Natan (a male name)', *Տաճատ (Tačat)* 'Tachat (a male name)'; Greek *Άννα (Ánna)* 'Ann(e) (a female name)' and *Ήβη (Ívi)* 'Hebe (Greek goddess)'; Latin *Ave, Eva!* 'Hail, Eve!'. In contrast, the Cyrillic alphabet is characterized by a far less marked distinction between majuscule and minuscule representations, as in Mongolian *Или* 'Ili (river)' or Ukrainian *Алла (Alla)* 'Alla (a female name)' and *Боб (Bob)* 'Bob (a male name)'.

My second remark concerns the letter position constraints in some languages, such as the Greek lowercase ς (sigma) in the word-final position in opposition to the word-initial uppercase *Σ*, as in *Σάββας (Sávvas)* 'Savvas (a male name)' and *Σέρρες (Sérres)* 'Serres (city)', as well as in opposition to the word-non-final lowercase *σ*, as in *σας (sas)* 'your', *σέλες (séles)* 'saddles', *σήψης (sípsis)* 'sepsis (genetive singular)', *σορός (sorós)* 'corpse', and *σος (sos)* 'sauce'. An even more complicated system of letter position constraints exists in Arabic, where they distinguish the initial, medial, final, and independent positions for every letter, which clearly manifests itself in the phonographemically reversible but visually non-reversible palindromes أداء *(ʔadāʔ)* 'performance', باب *(bāb)* 'door', لُول *(lūl)* 'lol (in Internet slang)', or شاش *(šāš)* 'muslin'.

The third concern is the existence of ambigrams, i.e. a visual play on words consisting of a calligraphic drawing with two or more clear interpretations as written words (Hofstadter 1987: 17). Although ambigrams are frequently dubbed "the visual equivalent of a palindrome" (Astle 2010: 307), there is a notable difference between the two phenomena: while the identical forward-and-


ISSN 2453-8035

backward spelling and/or reading of a palindrome results from a specific sequence of language units irrespective of their visual representation, an ambigram achieves its symmetry by relying solely on the visual form, regardless of the phonological and/or graphical unit reversibility or even composition (Hofstadter 1987: 18). Through manipulating the orientation of observation alone, any language unit (including palindromes) can be stylized to become an ambigram, e.g., the rotational ambigram *jump*, the circle ambigram *infinity*, or the mirror ambigram *Athena* (Trisna et al. 2024: 139-141). Difficulties arise when the graphic representation of an ambigram in scripts other than the Latin alphabet likens it to a palindrome, when, in essence, the visual similarity turns out to be a mere coincidence, as in the Arabic ليبيا *(Lībya)* 'Libya'. Thus, both ambigrams and palindromes can be regarded as ludolinguistic phenomena, yet the former are treated as readymade indivisible units and tend to primarily serve aesthetic or commercial purposes, whereas the latter are divisible into constituents arranged in a reversible sequence and principally belong in the realm of linguistics.

A ***syllabemically reversible word palidrome*** is a word spellable and/or readable the same horizontally (forward/backward) or vertically (downward/upward), the reversibility unit being a syllabeme. These palindromes are primarily characteristic of languages exploiting different types of syllabaries:
1) pure syllabaries, such as Ainu ト ノ ト *(tonoto)* 'alcohol', Cherokee ᏏᏅᏫᏅᎩ *(gasquosga)* 'he/she/it is craving, Japanese 東南東 *(tōnantō)* 'east-southeast', Okinawan いかいい *(ikai)* 'anchor', it';
2) alphasyllabaries, such as Amharic ቢምቢ *(bimbi)* 'mosquito', Gujarati ધોધ *(dhodh)* 'waterfall', Hebrew שֶׁמֶשׁ *(shémesh)* 'sun', Hindi शाबाश *(śābāś)* 'shabash, good job', Inuktitut ᑐᒃᑐ *(tokto)* 'caribou', Jeju 이멩이 *(imeng'i)* 'forehead', Khmer កាតាក *(kaataak)* 'leftover cooked rice that has been dried in the sun and is kept as a reserve food', Lhasa Tibetan ཀཀ *(kaka)* 'crow', Odia ଜାହାଜ *(jāhāja)* 'ship', Prakrit ससा *(sāsa)* 'breath', Punjabi ਦਮਾਦ *(dāmād)* 'son-in-law', Sanskrit किकि *(kiki)* 'coconut tree', Sinhala ගමන්මග *(gamanmaga)* 'path', Tamil விகடகவி *(vikaṭakavi)* 'a poet or jester who composes or performs humorous verses or songs for the king's amusement', Telugu కునుకు *(kunuku)* 'sleep', Thai ทายาท *(taa-yâat)* 'heir, heiress', Tigrinya ቋንቋ *(ḳʷanḳʷa)* 'language';
3) logosyllabaries, such as Assyrian Neo-Aramaic ܬܝܬܐ *(ṯāytā)* 'coming', Chinese 文言文 *(wényánwén)* 'Classical Chinese (texts)', Sumerian 𒍪𒄑𒍪 *(niĝ₂-a₂-ĝar)* 'deception', Ugaritic 𐎍𐎚𐎍 *(šrš)* 'root of a plant'.

If a syllabeme coincides with a morpheme, as in English *aye aye*, *corecore*, or *old-old*, the resulting palindrome is categorizable in its broader understanding as either syllabemically reversible (from a purely structural perspective) or morphemically reversible (the second and third examples equally


ISSN 2453-8035

qualifiable as lexemically reversible) (from a structural and semantic perspective). An example of a pseudosyllabemically reversible palindrome in English would be *re-entry*, considering that the word is syllabified as *re-en-try* and not as *re-ent-ry*.

A ***polygraphemically reversible word palindrome***, equally approached from a broader perspective, is a word spellable and/or readable the same horizontally (forward/backward) or vertically (downward/upward), the reversibility unit being either a random letter-combination, e.g., English *unga-bunga*, or a sequence containing at least one random graph, e.g., English *arty-farty*, *easy-peasy*, *okey-dokey*, *ooky-spooky* (their polygraphemic status still being retained even though part of the constituents are fully represented morphemes or lexemes). The term can be used as an umbrella denomination of several "exotic" types of palindromes, namely a compound palindrome, a palindrome-by-pairs and an aelindrome. A ***compound palindrome*** is a single word or longer assemblage composed of a series of palindromes, e.g., English *papooses* (*pap+oo+ses*) or *Agamemnon* (*Aga+mem+non*) (Donner 1996: 74-75). A ***palindrome-by-pairs*** is a palindrome that is reversible by blocks of two letters, e.g., English *reside in desire* ([*re*][*si*][*de*] [*in*] [*de*][*si*][*re*]) (Etherin 2021: 123). An ***aelindrome*** (a portmanteau word formed from the initials of its creator *A[nthony]+E[therin] + -lindromes*) is a variation on palindromes, which, instead of mirroring a repeated, fixed letter-unit, reverses units of variable sizes, as determined by premeditated numerical sequences, e.g., English *Melody, a bloody elm*, structured by the numerical palindrome *1234321*, since *[m]1 [el]2 [ody]3 [a blo]4* reflects backward as *[a blo]4 [ody]3 [el]2 [m]1* (Etherin 2021: 143). However, in spite of labelling aelindromes "a variation on lettristic palindromes" (Etherin 2021: 143), their creator subsequently denies any possibility of construing them as palindromes, remarking that the former are limited by the constraint of "palindromic bidirectionality in the numerical sequences underpinning them, but never […] in a consistent (operating a unit representing either a random letter-combination or a sequence containing a random linguistic unit (letter, word, line, sentence, paragraph, etc.)" (Etherin 2021: 144). Meanwhile, the introduction of polygraphemic reversibility into the typology designed in this paper allows for qualifying aelindromes as palindromes.

A ***morphemically reversible word palindrome*** is defined in the broader understanding of palindromy as a word spellable and/or readable the same horizontally (forward/backward) or vertically (downward/upward), the reversibility unit being a morpheme. My search for morphemically reversible palindromes has yielded examples representing full reduplicatives, e.g., Afrikaans *plek-plek* 'here and there', Ancient Greek *πάμπαν (pámpan)* 'wholly', Arabic ألف ألف *(ʔalf ʔalf)* 'million', Armenian *δωլ-δωլ (cal-cal)* 'having folds', Azerbaijani *tez-tez* 'frequently', Bengali *মাঝে মাঝে (majhe majhe)* 'sometimes', Central Bikol *nguyâ-nguyâ* 'chewing', Cornish *hwyhwi* 'you (plural)',


ISSN 2453-8035

Crimean Tatar *usul-usul* 'quietly', Czech *jenjen* 'only', Danish *farfar* 'paternal grandfather', Dutch *bushbush* 'wilderness', English *moonmoon*, French *bonbon* 'candy, sweet', Japanese もちもち *(mochimochi)* 'chewy as a rice cake', Lingala *máimái* 'wet', Mokilese *dehndehn* 'to be very old', Old Tupi *kûesekûesé* 'the day before yesterday', Swedish *hysch-hysch* 'secrecy', Turkish *anneanne* 'grandmother', Vietnamese *ránh ránh* 'clearly', as well as partial reduplicatives, e.g., Armenian *մոտամոտ (motamot)* 'very close', Assyrian Neo-Aramaic ܗܳܕܟ̰ܳ ܘ̰ܗܳܕܟ̰ܳ *(hādḵā w-hādḵā)* 'so-so', Brunei Malay *adi-beradi* 'sibling', Chuukese *patapat* 'cold', Czech *chtě nechtě* 'willy-nilly', English *blackity-black*, French *tête-à-tête* 'head-to-head', Hindi *हाथोंहाथ (hāthõhāth)* 'from hand to hand', Indonesian *beri-memberi* 'to give each other', Malay *awang-gemawang* 'atmosphere', Mokilese *pikapik* 'to be sandy', Norwegian *barnebarn* 'grandchild'. As manifested by the evidence collected in this article, the basic pattern behind these palindromes is as follows: [root] + ([affix(es)]) + [root]. The pattern slightly alters for the informal Brazilian Portuguese *nhenhenhém* 'a repetitive and/or annoying speech' (from Old Tupi *nhe'eng* 'to speak') as well as for the English slang word *lololol*, namely to [root] + [root] + [root], the root-final and root-initial consonants overlapping with the purposes of spelling simplification as well as of eye dialect-conditioned counter-standardization. Slang is blatantly opposed to standard and inevitably challenges it, whether in pronunciation, spelling, grammar, or stylistics, which fundamentally reflects "protest against the socially imposed behaviour patterns and pragmatic ethics" (Borys 2023b: 6). In this respect, Borys points out that "[a]s opposed to language standard, which represents a carefully "pruned", "shaped", and "sculpted" grapholect, slang, in spite of constituting a rather "gnarled", "misshapen", and "untrimmed" sociolect, mirrors an accurate projection of its users' cognition just as it is, free from any intervention, enforcement, or manipulation by external forces" (Borys 2023a: 80).

It is noteworthy that the delimitation of morphemically reversible word palindromes is ontologically fraught with a number of difficulties. Firstly, although morphemes are generally recognized as the smallest meaningful units of language, palindrome types upwards of the lexical level (phrase, line, sentence, stanza, paragraph, and text palindromes) prototypically exploit lexemes as operational units. Hence, the fact that all free morphemes coincide with lexemes complicates the matter even further, contributing to partial overlap between morphemically reversible word palindromes, on the one hand, and lexemically reversible word palindromes, on the other. Yet, the superposition results from the conventionally blurred linguistic boundary between a free morpheme and a simplex. Secondly, morphemically reversible word palindromes based on full reduplication overlap with tautonyms. A ***tautonym*** is a word or term consisting of two identical parts or syllables, e.g., English *bonbon* or *Bora Bora* (Żyśko 2017: 22). A word or term comprised of three identical parts or syllables

is known as a ***triple tautonym***, e.g., the scientific Latin name *Bufo bufo bufo* applicable to what is popularly known as the European toad.

Morphemically reversible word palindromes are not to be confused with what Gold terms ***morphemic palindromes***, which he defines as compounds whose constituents can be reversed without change of meaning, e.g., *book lung* and *lung book*, *downplay* (v) and *play down*, *overstuffed* and *stuffed-over* (Gold 1978: 164). However, the term ***palindrome*** traditionally applies to any SINGLE unit spellable and/or readable the same horizontally (forward/backward) or vertically (downward/upward), whereas, in the case of the so-called "morphemic palindromes", we are dealing with TWO independent units whose morphemic structure is interreversible and whose semantics happens to coincide. Consequently, in the light of more recent research, the controversial phenomenon represents none other than a ***morphemically reversible semordnilap***. A semordnilap (from the reversed spelling of ***palindromes***), or ***palinode***, is a word or sentence that makes a different word or sentence when spelt backwards, e.g., English *diaper* → *repaid* (Brandreth 2015: 247-248; Chism 1992: iii). This equally brings to mind the British phenomenon of ***back slang***, or ***back talk***, which is fully based on semordnilap, e.g., *tobacco* → *occabot* (Donner 1996: 57). Speaking of Gold's definition, of the three examples I have randomly selected for the purpose of mere illustration, only the first pair represents genuine compounds, whereas *downplay* and *overstuffed* qualify as derivatives formed through affixation (i.e. by adding prefixes *down-* and *over-* respectively). Thus, morphemically reversible semordnilaps rely on both free and bound morphemes, incorporating derivatives alongside compounds.

Finally, a ***lexemically reversible word palindrome*** represents, in its broader understanding, a word spellable and/or readable the same horizontally (forward/backward) or vertically (downward/upward), the reversibility unit being a lexeme. These units prove fairly common in phrase, line, sentence, stanza, paragraph, and text palindromes, yet their presence is remarkably limited in word palindromes. A lexeme serving as a constituent unit within another lexeme makes sense only in the case of compound lexemes. The examples identified in the present research all represent full reduplicatives, namely:

1) homomorphemic full reduplicatives (which overlap with the morphemically reversible word palindromes based on uninterrupted sequences of identical free morphemes, e.g., Albanian *avash-avash* 'little by little', Arabic بين بين *(bayna bayna)* 'in-between', Armenian *ջոկ-ջոկ (ǰok-ǰok)* 'separately', Azerbaijani *bir-bir* 'one by one', Brunei Malay *langit-langit* 'palate', Central Bikol *huyóp-huyóp* 'blowing (by the wind)', Chinese *亭亭 (tíngtíng)* 'towering', English *bun-bun*, French *chouchou* 'term of endearment', German *Klein-Klein* 'irrelevant details; trifle', Hindi *क़रीब-क़रीब (qarīb-qarīb)*


ISSN 2453-8035

'nearly', Korean *차례차례 (charyecharye)* 'in turn', Marathi *रामराम (rāmrām)* 'a form of greeting among Hindus', Mokilese *kidkid* 'to wrap', Norwegian *mormor* 'maternal grandmother', Old Tupi *eteeté* 'grandiose', Samoan *pi'opi'o* 'crooked', Swedish *finfin* 'excellent', Vietnamese *bươm bướm* 'butterfly');

2) heteromorphemic full reduplicatives (which include non-identical reduplicated free morphemes, derivatives and compounds based on interrupted sequences of free morphemes, Afrikaans *huisie-huisie* 'the game of playing house', Assamese *মাজে মাজে (maze maze)* 'seldom', Bengali *সঙ্গেসঙ্গে (śoṅgeśoṅge)* 'always in the company of', Chinese *一步一步* (yībùyībù) 'step by step', Crimean Tatar *bile-bile* 'on purpose', English *something-something*, Dutch *koppie-koppie* 'smart', German *Künstler-Künstler* 'artist with particular renown within artistic circles, not necessarily the wider public', Malayalam *പതുക്കെ പതുക്കെ (patukke patukke)* 'slowly', Norwegian *femti-femti* 'fifty-fifty', Portuguese *empurra-empurra* 'an instance of people pushing each other repeatedly', Tamil *மாறிமாறி (māṟimāṟi)* 'in turns').

**5. Conclusions**

The present study was designed to provide a detailed translingual account of word palindromy based on lexical evidence from over 100 structurally similar and dissimilar languages, both historically related and unrelated.

A palindrome constitutes a word, phrase, line, sentence, stanza, or text spellable and/or readable the same horizontally (forward/backward) or vertically (downward/upward) [depending on the script orientation in the language], with optional sensitivity to capitalization, diacritics, punctuation, and spacing, the reversibility unit being a phoneme, grapheme, syllabeme, polygrapheme, morpheme, lexeme, phrase, line, sentence, stanza, or text fragment. Consequently, a word palindrome is defined as a word spellable and/or readable the same horizontally (forward/backward) or vertically (downward/upward) [depending on the script orientation in the language], with optional sensitivity to capitalization, diacritics, and spacing (the latter applies to compounds only), the reversibility unit being a phoneme, grapheme, syllabeme, polygrapheme, morpheme, or lexeme.

Structurally, the logological material collected from 107 languages allows for distinguishing between phonemically reversible, graphemically reversible, phonographemically reversible, syllabemically reversible, polygraphemically reversible, morphemically reversible, and lexemically reversible word palindromes. This typology relies on the broader understanding of palindromy as applicable to any linguistic unit sequence that is characterized by either regular or irregular but formulaic reversibility.


ISSN 2453-8035

A phonemically reversible word palindrome is homophonic by default and constitutes a word readable the same horizontally (forward/backward) or vertically (downward/upward), the reversibility unit being a phoneme. Conversely, a graphemically reversible word palindrome is homographic by its nature and represents a word spellable the same horizontally (forward/backward) or vertically (downward/upward), the reversibility unit being a grapheme. If a word is both spellable and readable the same horizontally (forward/backward) or vertically (downward/upward), the reversibility unit being a regular phoneme-to-grapheme correspondence, the former is referred to as a phonographemically reversible word palindrome. A more structurally complex syllabemically reversible word palindrome is a word spellable and/or readable the same horizontally (forward/backward) or vertically (downward/upward), the reversibility unit being a syllabeme, as primarily applied to pure syllabaries, alphasyllabaries, and logosyllabaries. A polygraphemically reversible word palindrome serves as an umbrella term embracing predominantly compound palindromes, palindromes-by-pairs, and aelindromes, and is defined as a word spellable and/or readable the same horizontally (forward/backward) or vertically (downward/upward), the reversibility unit being either a random letter-combination or a sequence containing at least one random grapheme. An even more complex morphemically reversible word palindrome constitutes a word spellable and/or readable the same horizontally (forward/backward) or vertically (downward/upward), the reversibility unit being a morpheme. The morphemic reversibility is achieved through full or partial reduplication, the former case overlapping with tautonymy. Finally, a lexemically reversible word palindrome is a compound word spellable and/or readable the same horizontally (forward/backward) or vertically (downward/upward), the reversibility unit being a lexeme as part of a homomorphemic or heteromorphemic full reduplicative.

Further research should be done to investigate the structural diversity of palindromes upwards of the lexical level, as well as their graphical heterogeneity as regards capitalization, punctuation, spacing, and use of diacritics. There is equally abundant room for future progress in determining the role of rhythm in palindromy, especially types of rhythmic patterns and figures (Panasenko et al. 2023: 1534-1539), or in establishing the correlation between palindromicity, on the one hand, and language economy, on the other, namely in terms of lexical reduction (Lančarič & Bojo 2020: 91-94; Lančarič & Bojo 2024: 26-29).

**Abbreviations**

PbL – Palindromes by language

RbL – Reduplications by language

 ISSN 2453-8035

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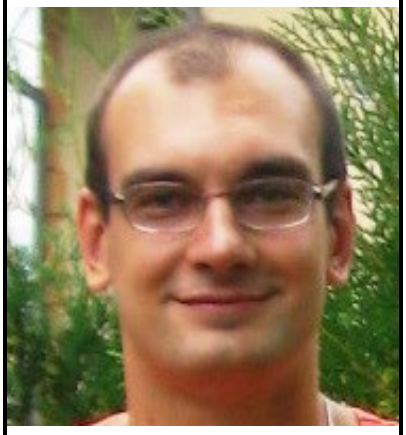
|  | *name:* | **Dmytro Borys** |
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