# Iconicity in Language

# Iconicity in Language:

# $An \, Encyclopaedic \, Dictionary$

Ву

Juan Carlos Moreno Cabrera

Cambridge Scholars Publishing



Iconicity in Language: An Encyclopaedic Dictionary

By Juan Carlos Moreno Cabrera

This book first published 2020

Cambridge Scholars Publishing

Lady Stephenson Library, Newcastle upon Tyne, NE6 2PA, UK

British Library Cataloguing in Publication Data A catalogue record for this book is available from the British Library

Copyright © 2020 by Juan Carlos Moreno Cabrera

All rights for this book reserved. No part of this book may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of the copyright owner.

ISBN (10): 1-5275-4741-8 ISBN (13): 978-1-5275-4741-4 "One summer, when there was a great drought at Fredkrisstad (Norway), the following words were posted in a W.C. 'Don't pull the string for bimmelim, only for bummelum'. This was immediately understood" (Jespersen 1933: 558).

"The existence of a universal symbolism in the case of certain sounds of language ... which has been merely a very plausible hypothesis for a long time, appears to be well established today. Individuals can be more or less sensitive to it, but their reactions are not found to be contradictory when observation is made with all the requisite guarantees: the timbre of [i], for example, goes together with the concept of smallness, which is not invalidated by either big or small in English; the timbre of [u] naturally evokes thickness and heaviness. [...] One need not to be a great scholar of articulatory phonetics to understand the reason for such identifications: [i{ee}] is the vowel for which the speech organs strive to realize the smallest possible resonating cavity toward the front of the mouth by pushing the bulk of the tongue toward the inside portion of the palate and by drawing in the lips the maximum against the gums; for [u], in contrast, the bulk of the tongue is drawn backward and the lips are pushed forward in such a way that the resonating cavity is as wide as possible. The symbolic equations [i] = thinness and [u] = thickness have an obvious physiological foundation, and it is this foundation that permits us to assume that they are the reality for all mankind, although the observation on which they are based did not involve the whole humanity—far from it" (Martinet 1965: 231; English version by T. E. Morgan in Genette 1995: 320-321).

# TABLE OF CONTENTS

ntroduction	ix
1	1
3	29
	58
)	85
3	109
	122
j	132
I	149
	157
	183
<u> </u>	188
<i>-</i>	204
Л	212
J	228
)	238
)	254
)	283

#### Table of Contents

R	288
S	299
T	342
U	363
V	367
W	376
X	381
Y	382
Z	386
Glossary	389
References	435

### INTRODUCTION

## 1. Iconicity in language

The form of words does not usually reveal their meaning, since it is impossible to predict the meaning of a word through a direct inspection of its form (auditory or visual). For example, what does the Georgian word bichi mean? For those with no knowledge of this language, it is impossible to guess its meaning by merely inspecting its phonetic configuration (it means 'boy'). But, in some cases, there is a certain natural affinity between the form and the meaning of a linguistic expression. Onomatopoeic words (such as English *cuckoo*, Georgian *guguli*) are typical examples of this motivated form-meaning relationship.

But the iconic nature of natural language goes far beyond onomatopoeic expressions. Motivated relationships between linguistic form and linguistic meaning can be seen in every component of language: sound symbolism, alliteration, phonaesthemes, reduplication, ideophones, echoic words, expressives, affix ordering, word order, lexical iconicity, and many other phenomena collected in this dictionary show that natural languages (both spoken and signed) have an undeniably iconic nature.

### 2. An encyclopaedic dictionary

This dictionary is encyclopaedic. This means that it includes not only a wide variety of terms and concepts directly relevant to the study of iconicity in language, but also gives examples of iconic expressions in many languages of the world (notably ideophones); natural sounds giving rise to onomatopoeias in different languages; animal nouns that are frequently based on the imitation of the sounds they produce (notably bird names); as well as summaries of significant works in the development of the study of iconicity in human language. More specifically, the entries in this dictionary can be grouped in the following categories: (a) specialized terminology of iconicity research; (b) concepts, principles, axioms and theories relevant to the study of linguistic iconicity; (c) linguistic units and processes related to linguistic iconicity; (d) significant iconic words and expressions; (e) ideophones; (f) graphic iconicity; (g) significant works in

x Introduction

the history of language iconicity research; and (h) iconicity in languages and language families.

This dictionary presupposes a basic knowledge of linguistics, which can be obtained by studying any elementary introduction to the field, such as Akmajian, Demers, Farmer and Harnish (2010) or Fasold and Connor-Linton (eds.) (2014).

# 3. Specialized terminology of linguistic iconicity research

Iconic research requires the study of different phenomena not mentioned or described in the traditional linguistic literature. In order to refer to some of them, new terms and expressions have been proposed in the specialised literature. The following list includes some neologisms defined and exemplified in this dictionary:

Allolanguage, anti-iconicity, automorphism, *Bildwort*, dysmorphy, echo words, echoic palindromoids, expressiveness, graphic radicals, icon, ideophone, incopyfixation, lexosymbolism, logosymbolism, mimetic, mimic nouns, *mimographie*, morphosymbolism, palimphony, pentestheme, phenomime, phonomime, *phonomimographie*, phonosemantics, phonosymbolism, picture words, psychomime, *Schallnachahmung*, *Schallverba*, *Schallwort*, *Urschöpfung*,

# 4. Concepts, principles, axioms and theories relevant to iconic research

This dictionary includes a wide selection of concepts directly relevant to the study of linguistic iconicity. The following alphabetical list enumerates all of the concepts defined and exemplified in this dictionary.

- A: absolute iconicity, analogue-building model of linguistic iconicity, anti-iconicity, arbitrariness, associative iconicity, autoiconism.
- B: *bow-wow* theory.
- C: Caesar's Law, secondary Cratylism, cultivated iconicity.
- D: de-iconization, diagrammatic iconicity, diagrammatic legisign, ding-dong theory.
- E: experimental approaches to linguistic iconicity, expressive, expressiveness, expressive symbolism.
- F: firstness, frequency code hypothesis.
- G: generative grammar.

- H: hypoicon, hypoiconic diagrammaticity.
- I: icon, iconic diagram, iconic imperative, iconic index, iconic lengthening, iconic motivation, iconic sign, iconic treadmill hypothesis, iconicity, iconicity chain, iconicity of complexity, iconicity of lexical categories principle, iconicity in Peirce's semiotics, iconicity meta-principle, iconism, *ideomimographie*, index, isomorphism.
- J: Janus-faced iconicity.
- K: kinaesthetic iconicity, kinomorphomimetic iconicity.
- L: lexical iconicity hierarchy, linear order principle.
- M: matrix and etymon theory, meta-iconic markedness principle, meta-iconic principle of universality, secondary mimologism, mirror principle, multimodal iconicity.
- N: naïve iconism, natural iconicity.
- O: onomasiological iconicity, onomatopoeia.
- P: phenomimetic root, phonomimetic iconicity, phonomimetic root, phono-symbolism, picture theory of the proposition, polysynthesis parameter, proximity principle.

Qu: quantity principle.

- R: referential association binding, relative iconicity.
- S: secondary iconicity, secondness, semasiological iconicity, sizesound symbolism, sound shape symbolism, sound symbolism, symbol, syncretism principle.
- T: thirdness.

#### Terms related to Peircean semiotics:

Diagrammatic legisign, iconicity in Peirce's semiotics, firstness, hypoicon, hypoiconic diagrammaticity, icon, iconic diagram, iconic index, index, secondness, symbol, thirdness.

#### 5. Linguistic features and processes related to iconicity

This dictionary gathers together a wide selection of linguistic phenomena directly related to iconicity. The following list includes the relevant entries grouped by linguistic level:

• General: chromaesthetic iconicity, diagrammatic iconicity, endophoric iconicity, exphoric iconicity, expressive, echoism, gestalt iconicity, expressive symbolism, iconicity in invented languages, iconicity in sign languages, imagic iconicity, mimicking, Kaluli Gono To onomatopoeic expression, onomatopoeic iconicity,

xii Introduction

paradigmatic iconicity, phonaesthetic iconicity, primary iconicity, referential symbolism, sensory sound symbolism, size-sound symbolism, sound shape symbolism, sound symbolism, synesthesia, synaesthetic iconicity, structural iconicity.

- **Phonology**: alliteration, apophony, articulatory iconicity, *boubakiki* effect, dysphony, iconophone, intonation, phonestheme, phonetic metaphors, phonetic symbolism, phonological iconicity, phonometaphoric iconicity, prosodic iconicity, *takete-maluma* phenomenon, tonal iconicity, tongue-twister, vowel harmony.
- Morphology: ablaut reduplication, anti-iconic suffix ordering, auditory iconicity, blending, dysmorphy, echoic palindromoids, echo words, echoic words, expressive morphology, ideophone, ideophones in verbal art, incopyfixation, *ištiktukai*, morphological iconicity, nominalization, palimphony, pentestheme, reduplication, spatial deixis.
- **Lexicon**: basic vocabulary, bird calls, bird names, brand names delocutive ornithonyms, etymology, global etymologies, imitative roots, lexical iconicity, lexical symbolism, mass nouns, nursery words, ornythonyms, *verba sonandi*.
- Syntax and Discourse: calligram, grammatical iconicity grammaticalization, syntactic iconicity, syntagmatic iconicity, textual iconicity.

## 6. Significant iconic words and expressions

This dictionary includes a brief explanation of some notable mimetic radicals that are used in different languages, including English. The following are the relevant entries:

Babble, bang, blah blah, boom, butterfly, buzz, bow-wow, bzzz, cackle, click, crack, crash, cricket, croak, crow, cuckoo, cucumber, gargle, grunt, kap, kiskadee, mim/mom/mum, pip, puff, see-saw, she sells sea shells..., tick-tock, veni vidi vici, {-wr-}, zigzag.

#### 7. Ideophones

Ideophones are one of the most interesting and challenging aspects of linguistic iconicity. The following list includes all the entries dealing with ideophones in different languages. As can be immediately seen, they are not exclusive to African languages and can be found in languages all over the world.

Baka, Bantu, Bini, Cantonese, Chintang, Cilubà, Didinga, Ebwela, Edo, Emai, Ewe, Gbaya, Hausa, Hindi, Hixkaryana, Karo, Katuena, Khmer (Cambodian), Kilba, Kolokuma Ijo, Mundang, Nigerian Pidgin, Pastaza Quechua, Ruihong, Setswana, Shona, Siwu, Somali, Sotho, Souletin Basque, Swedish Sign Language, Tamil, Tetela, Thai, Tommo-So, Totonac, Tsonga, Turkish, Vietnamese, Wolaitta, Yir-Yoront, Zulu.

### 8. Graphic iconicity

Writing has many iconic properties. The following entries explore this aspect of linguistic iconicity:

Chinese characters, comics, graphological iconicity, hieroglyphics, Japanese writing, Korean alphabet, letter-iconicity, *mimographie*, picto-phonetic iconicity, pictographic iconicity, picto-phonetic-graphic iconicity.

# 9. Significant works in the history of language iconicity research

This dictionary contains summaries of pioneering works in the study of linguistic iconicity; each one has its own entry. These are listed in chronological order:

- Cratylus
- Grammatica Linguae Anglicanae (J. Wallis 1653)
- Traité de la formation méchanique des langues et des principes physiques de l'étymologie (de Brosses 1765)
- Nouveaux essais sur l'entendement humain (Leibniz 1765)
- Origine, formazione, meccanismo, ed armonia degl'idiomi (Hervás y Panduro 1785)
- Dictionnaire des onomatopées françaises (Nodier 1808)
- Über den Naturlaut (Buschmann 1853) [see NURSERY WORDS]
- Doppelung (Reduplikation, Gemination) (Pott 1862)
- Über die Verschiedenheit des menschlichen Sprachbaues und ihren Einfluß auf die geistige Entwicklung des Menschengeschlechts (W. von Humboldt 1863)
- Voces variae animantium. Ein Beitrag zur Naturkunde und zur Geschichte der Sprache (Wackernagel 1867)
- Primitive Culture. Researches into the Development of Mythology, Philosophy, Religion, Language, Art and Custom (Tylor 1871)

xiv Introduction

- Primitive and universal laws of the formation and development of language. A rational and inductive system founded on the natural basis of onomatops (Augustus & F. Pincott 1874)
- Die Entstehung der Sprache durch Nachahmung des Schalles (Curti 1885)
- Onomatopées et mots expressifs (Grammont 1901)
- Schallnachahmungen und Schallverba in Litauischen (Leskien 1902)
- Völkerpsychologie. Eine Untersuchung der Entwicklungsgesetze von Sprache, Mythus und Sitte Erster Band. Die Sprache (Wundt 1904)
- Schallnachahmung, Wortschöpfung und Bedeutungswandel (Hilmer 1914)
- Elementare Wortschöpfung (Oehl 1917-1924)
- *Symbolic value of the vowel I* (O. Jespersen 1922)
- Language. Its nature, development and origin (Jespersen 1922)
- Laut, Ton und Sinn in Westafrikanischer Sudansprachen (Westermann 1927)
- A Study in phonetic symbolism (Sapir 1929)
- Fangen-Finger-Fünf. Studien über elementar-parallele Sprachschöpfung (Oehl 1933)
- Das Lallwort in der Sprachschöpfung (Oehl 1933) [see NURSERY WORDS]
- The sign is not arbitrary (Bolinger 1949)
- Quest for the essence of language (Jakobson 1965)
- Diccionario de voces naturales (García de Diego 1968)
- Psychophonetik. Untersuchungen über Lautsymbolik und Motivation (Ertel 1969)
- Recherches expérimentales sur le symbolisme phonétique (Peterfalvi 1970)
- Notes on Expressive Meaning (Diffloth 1972)
- Mimologiques. Voyage en Cratyle (G. Genette 1976)
- Osnovy fonosemantiki (Voronin 1982)

In the entries devoted to these papers and books, the main proposals and ideas are briefly described and exemplified. In all cases, the original ideas and statements have been respected. In the references to the world's languages and language families, some out-of-date names have been updated.

#### 10. Iconic words in languages and language families

This dictionary contains iconic words and expressions from different languages and language families. The following list includes only those languages having an entry in this dictionary. Those that are only mentioned in passing without providing at least one example of their iconic words and expressions, are not included in this list. Those languages marked with an asterisk have their own entry. The figures in parentheses refer to the number of examples of each language provided in the dictionary.

Each language has a reference entry listing all entries in which examples of its iconic words and expressions can be found.

Language families: African languages, American Indian languages, Asian languages, Australian languages, Balto-Slavic languages, Finno-Ugric languages, Germanic languages, Indo-European, Pacific languages, Romance languages, Slavic languages.

Spoken languages (languages or families with an asterisk have their own entry):

- African languages\*: Adele (1), Akpafu (1), Akposo (1), Akra (1), Asante (4), Baka\* (12), Bambara (12), Bangala (1), Bini\* (75), Boviri (2), Chichewa (4), Cilubà\* (50), Didinga\* (43), Dinka (2), Dogon (1), Duala (1), Ebwela\* (32), Ewe\* (67), Fang (1), Fulani (23), Fur (1), Ganda (1), Gbaya\* (35), Gola (1), Guang (1), Gwari (1), Hausa\* (37), Haya (1), Hottentot (Khoisan) (1), Ibibio (2), Ibo (2), Ifumu (1), Ijo\* (12), Ik (1), Ju/'hoan (1), Kanuri (4), Kilba\* (27), Kimbundu (1), Kisi (6), Kongo (2), Kru (1), Kunama (1), Lamba (8), Luvale (2), Maasai (3), Maba (2), Makua (1), Mande (2), Mandingo (6), Mbay (1), Mbundu (1), Mende (7), Mokilko (2), Monjombo (2), Mpongwe (3), Mwera (3), Ngiti (1), Ngombe (2), Nubian (2), Rundi (1), Rwanda (1), Sandawe (2), Sango (1), Setswana\* (9), Songhay (13), ShiNzwani (1), Shona\* (58), Siwu\* (32), Sotho\* (20), Susu (1), Swahili (4), Taita (1), Tetela\* (28), Tsonga\* (9), Twi\* (27), Vai (2), Venda (1), Wolof (2), Xhosa (5), Yao (2), Yoruba\* (55), Zulu\* (106).
- Afro-Asiatic: Alaba (1), Amazigh (1), Amharic (2), Arabic\* (75), Bedauye (Beja) (2), Burji (1), Harari (2), Hebrew\* (244), Tigre (1), Tuareg (1), Oromo (Galla) (11).
- Eskimo-Aleut: Aleut (2), Eskimo (4), Greenlandic (2).

xvi Introduction

- American Indian\*: Araucanian (Mapudungun, Huilliche) (1), Apalaí (1), Arawak (1), Bare (1), Biloxi (1), Bonari (1), Botocudo (6), Bribri (2), Carib (1), Chinook (1), Chippewa (1), Choctaw (1), Cocopa (1), Cora (2), Cree (3), Dakota (3), Damana (4), Guarani (12), Guatuso (1), Hopi (2), Karitiâna (3), Kapiekram (Canela) (1), Kahita (1), Karo\* (24), Katuena\* (46), Kayapo (1), Koasati (1), Kuskokwim (1), Lule (1), Maku (1), Maxakalí (3), Micmac (1), Miwok (1), Moseten (1), Muinane (2), Nahuatl (9), Nambikuara (2), Navaho (4), Nez-Perce (4), Nootka (3), Omagua (1), Otomi (2), Oyampi (1), Potawatomi (2), Purépecha (6), Quechua\* (118), Quiché (2), Quichua (10), Sahaptin (2), Seneca (1), Shipibo (1), Tariana (4), Tepehuano (1), Totonac\* (36), Tsimshian (1), Tupi (5), Tuscarora (1), Tzeltal (1), Vilela (2), Wishram (Upper Chinook) (4), Wiyot (2), Yucatec-Maya\* (42).
- Asian: Ainu (3), Bahnar (12), Balti (4), Burmese (1), Burushaski (2), Cantonese\* (57), Chinese\* (108), Chintang\* (6), Chukchee (1) Hainan Chinese (1), Hmong\* (14), Itelmen (2), Japanese\* (76), Javanese (7), Kalmyk (2), Kammu (9), Ket (1), Khmer\* (32), Khumi\* (27), Korean\* (58), Koryak (3), Manchu (3), Mlabri (1), Mongolian (2), Nicobarese (2), Pacoh (4), Rengao (6), Ruihong\* (46), Semang (1), Temiar\* (17), Thai (6), Tibetan (1), Tungusic (1), Vietnamese\* (113), Yukaghir (1), Yunnan Chinese (1).
- Creoles and pidgins: Berbice Dutch (5), Fa D'ambu (3), Ghanaian Pidgin English (1), Guadeloupean French Creole (4), Guyanese (4), Haitian (6), Jamaican (14), Krio (12), Kriyôl (2), Louisiannais (1), Martiniquais (2), Negerhollands (6), Papiamentu (9), Saramaccan (11), Sranan (8), Trinidad French Creole (1).
- Dravidian: Kannada (2), Malayalam (2), Tamil\* (76).
- Indo-European: Afrikaans (3), Albanian (9), Ancient Indian (1), Anglo-Saxon (2), Armenian (4), Asturian (1), Balto-Slavic, Bengali (2), Breton (3), Bulgarian (4), Catalan\* (94), Czech (24), Cornish (1), Dutch (29), Danish (21), English (1974), Flemish (1), French\* (484), Galician (2), German (358), Greek (Ancient and Modern) (68), Gothic (6), Hindi (29), Hindustani (2), Icelandic (14), Proto IE (14), Irish (9), Italian (50), Kurdish (1), Latin (185), Latvian (29), Lithuanian (204), Livonian (1), Marathi (5), Nepali (2), Norwegian (19), Occitan (1), Old Irish (1), Old Slavic (2), Persian (46), Polish (26), Portuguese (13), Provençal (2), Punjabi (2), Romanian (6), Russian (46), Sanskrit (43), Scottish Gaelic (2), Serbian (34), Sinhalese (1), Slovak (1), Slovene (2), Spanish\* (278), Swedish (26), Swiss German (1), Urdu (3), Welsh (19).

- Caucasian: Abkhaz (4), Chechen (2), Dzhek (1), Georgian\* (72), Kuri (1), Lezguian (1), Mingrelian (1), Svan (1), Tabasaran (2), Udi (1).
- Uralic: Cheremis (Mari) (1), Estonian (43), Finnish (100), Hungarian (90), Khanty (10), Komi-Zyrian (1), Livonian (1), Mordvin (2), Sami (2), Udmurt (1), Vepsian (1).
- Turkic: Chagatay (1), Khakas (29), Tatar (1), Turkish\* (104) Turkmen (1), Uyghur (1), Yakut (1).
- Other European: Basque\* (344).
- Oceanic: Anatom (1), Balinese (1), Bauro (1), Dayak (3), Fijian (4), Hawaian (1), Ilocano\* (61), Indonesian (21), Kapampagan (1), Madurese (2), Malagasy (10), Malay (18), Maori (10), Marshallese (1), Merelava (1), Mokilese (2), Motu (2), Samoan (4), Sundanese (1), Tagalog (18), Tahitian (8), Tausug (1), Tongan (7), Tontemboan (2), Torres Island (1), Tumleo (2), Ureparapara (Löyöp) (1), Vanua (1), Yami (1).
- Australian: Djagubay (7), Djaru (4), Dyirbal (4), Gooniyandi\* (35), Jaminjung\* (13), Kabi (1), Madhi Madhi (1), Nhanda (5), Wemba Wemba (1), Yir-Yoront (90).
- Papuan: Bamu (1), Hua (Yagaria) (1), Ibu (2), Kapaur (1), Maisin (2), Monumbo (3), Namau (Purari) (1), Nasioi (2), Savo (1), Sentani (1).
- Trans-New-Guinea: Amele (1), Bongu (2), Kaluli\* (47), Kobon (1), Melaripi (1), Pay (1), Tauya (1), Telefol (1), Toaripi (1).
- Sign languages: Adamorobe Sign Language\*, American Sign Language\* (2), Australian Sign Language\* (3), Brazilian Sign Language, British Sign Language\* (7), Chinese Sign Language, French Sign Language\*, Danish Sign Language, German Sign Language\*, Icelandic Sign Language (1), Indo-Pakistani Sign Language\*, Italian Sign Language\*, Spanish Sign Language\* (6), Taiwanese Sign Language\* (5).
- Invented languages: Black Speech (1), Klingon(ese) (2), Na'vi, Quenya (37).

## 11. Glossary

The glossary contains a semantically classified list of all the iconic words and expressions that appear in the dictionary. It will be very useful for quick consultation.

xviii Introduction

# 12. Acknowledgement

All sign language drawings were made by my colleague: Iván Martín Cerezo.

#### Α

# A Study in phonetic symbolism (Sapir 1929)

This paper is one of the first experimental studies in phonetic symbolism. In the experiments reported, E. Sapir (1884-1939) hoped to determine whether there are certain preferential tendencies towards expressive symbolism\* in the meaning contrast 'big'/'small'. In one of these experiments, the subjects were presented with meaningless word pairs differing only in the vowels [a]/[i] and were requested to indicate in each case which of the two meaningless words meant the larger and which the smaller variety of an arbitrary selected meaning. It was observed that an overwhelming majority chose the [a]—word as denoting the larger variety of the selected meaning. The paper contains three interesting observations: (1) Vocalic and consonantal contrasts tend to have a definite symbolic feeling-significance barely related to the associative values of actual words. (2) It makes little difference whether the phonetic contrast was contained in a phonetically 'possible' or a phonetically 'impossible' context. (3) The certainty of the symbolic distinction tended to vary with the nature of the phonetic contrast (Sapir 1929: 228). In this paper, Sapir introduced the expression phonetic symbolism: "we are really dealing with a measurably independent psychological factor that for want of a better term may be called 'phonetic symbolism'" (Sapir 1929: 233). In addition, Sapir provided an articulatory explanation for the observed symbolic interpretation of the contrast between [a] and [i]. In the case of [i] the tongue is high up towards the roof of the mouth and articulates forward, so that the vibrating air is passing through a narrow resonance chamber. In the case of [a], the tongue is lowered and the vibrating air passes through a much wider resonance chamber (Sapir 1929: 16).

#### **Abkhaz**

A Northwest Caucasian language spoken in Abkhazia (South of the Greater Caucasus Mountains, northwestern Georgia) by approximately 200,000 people

See BUTTERFLY, PRIMITIVE CULTURE, VÖLKERPSYCHOLOGIE

#### **Ablaut Reduplication (AR)**

A type of reduplication with vowel alternation frequently used in a number of languages to mimic movement. Ablaut reduplication is associated with a physical (visual or acoustic) alternating movement in the following way: reduplication in AR mimics continuity, including repetition, plurality, distribution, and habitualness; vowel alternation mimics change, including variation, change of direction, instability, uncertainty, vacillation, reciprocity, and interruption. The following examples are taken from Moreno-Cabrera (2017: 75-81), which gives the relevant sources.

English AR expressions conveying motion: dangling and flapping: dindle-dandle, dingle-dangle, flip-flap, flipperty-flopperty; wagging: wiggery-waggery, wiggle-waggle, wiggly-waggly, wig-wag, wriggle-wraggle; swinging: pip-pop, swig-swag, wigglety-wagglety; see-saw: shig-shog, shoogle-shaggle, titter-totter, titter-tatter, swing-swang, quee-quaw, see-saw; nodding and bobbing: niddle-naddle, niddle-noddle, nid-nod; trembling and unsteadiness: didder-dadder, didder-dodder, niddle-noddle, pintle-pantle, shig-shog, titter-totter, whiltie-whaltie, wibble-wobble, wibwob, widdle-waddle, wimbly-wambly, wingle-wangle; walking and running: jitty-jetty, neck-nack, stip-step; limping, hopping and jogging: chick-chock, hiphop, hippety-hoppety, jidderty-jadderty.

Basque ARs for swinging and related movements: **swinging, rocking, staggering, swaying**: bantzin-bantzan, bilin-bolan, biliki-balaka, bilinbabalanba, bilintzi-balantza, bilist-balast, binbi-banba, binbili-bonbolo, bindi-banda, dilin-dalan, dinbili-danbala, dingili-dangala, dingolodango, dringili-drangala, kikili-kakala, kikili-makala, kinkili-kankala, kizkili-kazkala, kixkiti-kaxkata, tiki-taka, tilintalanka, tingli-tangla, trinko-tranko, trinkulin-trankulin, zibuka-zabuka, zirrun-zarrun.

Estonian ARs: tipa-tapa '(walk) with quick and short steps'; kips-kõps '(walk) with quick and short steps'; liipadi-laapadi '(to move) heavily, cumbersome, dragging along'; nika-naka '(to move) steadily, heavily with short steps'; vinka-vonka '(for a vehicle) when not heading straight, from one side to the other, zigzagging'; hiroh-haroh 'scattered, confused'; kriima-kraama 'carelessly, sloppy'; liga-loga 'confused, sloppy, bad'; pirapara 'scattered, sloppy, carelessly, quickly'; plihva-plahva 'bungling, carelessly'; limma-lamma '(to do something) bungling, carelessly, thoughtlessly'; priuh-prauh 'quickly, carelessly'.

Khakas (South Siberian Turkish): *tip-tap* 'blinking, winking'; *sh'iltix-sh'altix* 'twinkling, gleaming'; *xújbang-xájbang* 'zigzagging'; *pitir-patir* 'to and fro'; *tirbax-tarbax* 'entangled'; *táltang-túltang* 'toddling'; *sîrt-sart* 'hopping along' (like a magpie); *salá-sulá* 'anyhow, somehow'; *sîréng-saráng* 'thoughtlessly'; *sirex-sarax* 'upstart'; *xijir-xajir* 'crooked'.

Ablaut reduplication can also mimic some types of alternating sounds (Moreno Cabrera 2017: 69-75):

English AR expressions conveying sound: click-clack 'reduplicated expression for recurring or successive sounds of the click type'; clip-a-clap and clip-clop 'imitation of sounds of alternating rhythm'; knick-a-knock 'a succession of knocks of alternating character'; knick-knack, nick-nack 'an alternation of knocking sounds'; pitter-patter 'an imitation of a rapid alternation of light beating sounds, rain, hail, light footfall'; tick-tack 'an imitation of a reduplicated or alternated sound, esp. that made by a clock'; tick-tock 'an imitation of the ticking of a clock, esp. the slow ticking of a large clock'; clish-clash 'the reciprocal or alternate clash of weapons'; clitter-clatter 'alternating repetition of clattering noise'; drip-drop 'continuous dripping with alternation of sound'.

Basque AR expressions mimicking a repetition of alternating sounds: cracking, cracking; crackling: grik-grak 'crackling'; kriski-kraska, krisk-krask 'creaking, crackling'; kriskitin-kraskitin 'clacking of castanets, snapping'; klis-klas 'to crack, crackle'; kisk-kask, kisk-kosk 'to clash, crack'; kirrin(ka)-karran(ka) 'squeaking, creaking'; splashing: pilisti-palasta, plisti-plasta 'splish-splash'; tilist(i)-talast(a) 'to splash'; txipli-txapla, txipi-txapa, txipla-txapla 'to splash about'; tisti-tasta 'to splash'; zifli-zafla 'splashing about'; tifli-tafla 'beating, splash'; xifli-xafla 'to splash about'; zipli-zapla 'to splash'; glin-glan 'wine poured in a bottle'; pilist-palast 'sound of water moving in a bucket'; beating, hitting, slapping: tis-tas 'heart beating'; tiki eta taka 'to hit'; trinbilin-tranbalan 'hitting'; zipirt eta zapart 'hitting, beating'; zipirt-zapart 'to throw punches left, right and center'; zifri-zafra 'beating, shaking'; tri-tra 'to beat'; xirti-xartaka 'to kick a ball around'; kri-kra 'strumming'; tingili-dangala 'to crash'; ris(t)-ras(t), sisti-sasta 'to burst, sting, punch'.

Khakas: *Tir-tar* 'loud crackling'; *tish-tash* 'soft repetitive noise' (steps, knocking); *tishlîrge/tashlîrge* 'to stamp, to knock'; *pilchix-pálchix* 'splashing'; *pux-pax* 'splashing noise'; *sigdir-sagdir* 'clattering'; *tizh'ix-tazh'ix* 'clicking noise'; *tizh'ir-tazh'ir* 'strong, repetitive noise' (shooting, thundering); *sibix-sabix* 'whispering'; *xirt-xart* 'clucking'; *mizh'ir-mazh'ir* 

'crackling, crunching sound', 'noisy quarrel'; *nizirt-nazirt* 'strong noise'; *tidirt-tadirt* 'strong, sharp noise'; *sabá-subá* 'muttering, unintelligible speech'; *pish-pash* 'Shorian dialect'; *sir-sar* 'strong crying'; *sîîx-saax* 'screaming, squeaking'.

Mandarin Chinese: didá 'the sound of dripping', dīngdōng 'the sound of tingling', dīngdāng 'the sound of jingling or cluttering', pīpā 'the sound of crackling'.

See REDUPLICATION

#### **Absolute Iconicity**

A property of a set of words for which there is a similarity function that relates form and meaning. In absolute iconicity, there is a correlation between one or more form dimensions and one or more meaning dimensions. The most obvious example is onomatopoeia\*, for which forms are intended to imitate sounds in nature. Thus, there appears to be a weak correlation between the vowel formants in conventional words for animal sounds (*moo*, *quack*, *cheep*) and the perceived formants in the actual sounds made by the animals (Gasser, M., N. Sethuraman and S. Hockema 2010: 167).

#### Adamorobe Sign Language

The Adamorobe Sign Language (AdaSL) is a sign language used in Adamorobe, an Akan village in Eastern Region, Ghana. The following data are taken from Edward 2015.

Edward groups the AdaSL signs mimicking size and shape into the following classes. (A) Complete iconicity: the handshape is configured to represent the entire entity by its size or shape, as in the signs for BENCH, BARREL, SMALL, BIG; (B) Synecdoche representation: the handshape is configured to represent the size or shape of a part of an entity denoting the whole, as in the signs for SUNDAY (opened book), MAN (beard), WOMAN (breast), MONTH (crescent); (C) Activity representation: the sign denotes an entity by mimicking an action directly related to that entity, as in THURSDAY (cutlass repair), ADAMOROBE (drumming), CHURCH (closing palms as in worshipping).

Concerning the denotation of time, the hand moves forward to denote TOMORROW and backwards to denote YESTERDAY. The first sign is also used to convey future tense.

Iconic metaphors are also used to express cognition in AdaSL. For instance, the sign for UNDERSTAND is signed with the index finger touching the side of the forehead and then both hands open up simultaneously, literally THINK+CLEAR; FORGET is signed as THINK+LOST and CONFUSE as THINK+HAPHAZARD.

Verbal directionality in AdaSL is highly iconic, as in signed languages in general. For example, the signs EAT, HAVE, LIKE, LOVE, BRING contain a movement towards the signer; CARRY contains a movement from the signer toward other participants in the signing act and TELL, GIVE, and PAY can present both movement types to signal whether the signer is the source or the goal of the action referred to.

#### Adele

Kwa language of Togo and Ghana spoken by approximately 37,000 people.

See LAUT. TON UND SINN IN WESTAFRIKANISCHER SUDANSPRACHEN

### African languages

Onomatopoeic words and expression are common in African languages. The following examples mimic sounds made by certain animals (Childs 1994: 190): Kisi nyaayoo 'meow', ng oong ng oong ndo 'bullfrog'; Gbaya kokeng ge-koo 'cock-a-doodle-do'. They can also mimic the noise made by certain machines: Swahili piki-piki 'motorcycle', ting'a-tin'a 'tractor'; Gbaya kutu-kutu-kutu 'rumble of a car motor'; Ibibio toi-toi-toi 'motorcycle sound', akpokko-toi-toi 'motorcycle'; Yoruba fakafiki 'sound of a train'. The sound of moving air is mimicked in the following onomatopes\*: Kisi faka-faka 'moving fast', feelfee-fee 'being blown, a whistle, a horn, breathing', foo 'wind whistling'; Hausa fir 'flutter of wings'; ShiNzwani (Comorian) fwii 'sound of rapidly passing by'.

Ideophones\* were first observed in African languages. They are extensively used in Bantu languages, including: Asu, Basa, Bemba, Bobangi, Bujeba, Bulu, Bushong, Cewa, Chagga, Duala, Ganda, Giriama, Holoholo, Hunde, Ila, Kamba, Kiha, Kikuyu, Konde, Kongo, Kwangali, Lamba, Luba, Luvale, Mongo, Mwera, Ndebele, Ngombe, Ntomba, Nyamwezi, Nyanja, Nyiha, Ombo, Rimi, Ronga, Runyankore, Rwanda, Rundi, Ruund, Sena, Shambala, Shona, Songye, Sotho, Swahili, Swati, Tabwa, Tetela, Tonga, Tsonga, Tswana, Tumbuka, Venda, Xhosa, Yao, and Zulu (Samarin 1971: 141, 160). Here are some examples: Ngombe (*yenge akekumaka*) *keku-keku* 'the child stutters'; Lamba *ukupama pame pame pame* 'to beat and beat and beat again';

Shona *chámuchácha-muchácha* 'straining', *mbiriviri* 'fire'; Yao (*nyama siluwimwile*) *kuputu kuputu* 'the herd went off at a full gallop' (Samarin 1971).

African languages of other linguistic families also have ideophones: Gbaya tál-tál 'pure white', kilang-kilang 'a zigzagging motion'; Somali shalalab 'sound of rain dripping', halalac 'to give off a sparkling light'; Siwu gùdùù 'pitch dark', gblogblogblo 'bubbling', kpotoro-kpotoro 'walking like a tortoise', kpie-kpie 'lukewarm' (Dingemanse 2012: 661); Yoruba gboogboo 'space being repeatedly clear', búú-búú 'completely hidden underneath', fèrègèdè-feregede 'having very wide appeal', porogododo-porogododo 'being completely used up', hábá-hàbà-hábá 'very difficult and clumsy motion' (Awoyale 1989: 21, 24); Kilba (a dialect of Huba, a Chadic language) wàdàu 'being hurt', màkìdàmà 'surprise' (Muazu 2009: 5).

See AKUAPEM TWI, BAKA, BANTU IDEOPHONES, BINI, CILUBÀ, DIDINGA, EBWELA, EDO, EMAI, EWE, GBAYA, HAUSA, KOLOKUMA IJO, KILBA, LAUT, *TON UND SINN IN WESTAFRIKANISCHER SUDANSPRACHEN*, MUNDANG, NIGERIAN PIDGIN, SETSWANA, SHONA, SIWU, SOMALI, SOTHO, TETELA, TOMMO-SO, TSONGA, WOLAITTA. ZULU

#### **Afrikaans**

See BIRD NAMES

#### Ainu

Language of the Ainu people on the northern Japanese island of Hokkaido. It is spoken by approximately 15,000 people.

See CACKLE, CUCKOO, PRIMITIVE CULTURE

### Akpafu

A dialect of Siwu\*.

See BUTTERFLY, SIWU

### Akposo (also Kposo, Ikposso)

Kwa (Niger-Congo) language spoken in Ghana, near the Togo border, by approximately 8,000 people.

See BUTTERFLY

### Akra [Ga]

Kwa language spoken in Ghana by approximately 700,000 people.

See PRIMITIVE CULTURE

## Akuapem Twi ideophones

Akuapem Twi is a dialect of the Akan language spoken by the Adamorobe people of the Eastern Region of Ghana.

The following data and classification are taken from Edward 2015.

Akuapem Twi ideophones are usually reduplicated as in *ngaa-ngaangaangaa* 'the sound of a baby's cry' or *pum-pumpumpum* 'the sound of heavy knocking'; partial reduplication is also possible, as in *kikiriw* 'rough surface', *fekɔfekɔ* 'smooth'. Ideophones can have special phonemes not found in normal words, as with the labiovelar [gb] in *gbim* 'collision'. Vowel lengthening only occurs in ideophones: *sokooo* 'rosy/smooth/ wealth'. In general, ideophones behave as adverbs and, therefore, are linked with verbs: <code>sseree kwaakwaa</code> 'he/she laughed', where <code>kwaakwaa</code> is an ideophone and <code>sseree</code> means 'he/she laughed'.

From a semantic point of view, some ideophones depict sound: gagaga 'pain', ngaa-ngaa 'cry of a baby', kai 'o'clock'; others reproduce tactile sensations: fekɔfekɔ 'smooth', kikiriw 'rough surface', gyirumgyirum 'not very smooth'; others depict smell: hũam 'pleasant smell', nyãn 'fetid', kãnkãn 'bad smell'; others suggest visual impressions: korangyee 'clear', kusuu 'cloudy', kabii 'darkness', hãn 'brightness'; other ideophones represent movement: santan 'rapid', kɛkyɛ 'skillful', pa 'fast pace', pampam 'briskly'; in other cases, size and shape are depicted: kakraa 'huge/big', fĩaa/tĩaa/hwĩaa 'slim', bɛbrɛɛ 'many', teteɛter 'flat/plain'; yantamm 'vast'.

# **Alaba (East Cushitic)**

East Cushitic (Afro-Asiatic) language spoken in the Great Rift Valley (Ethiopia) by approximately 300,000 people.

See CROW

#### Albanian

Indo-European language spoken in Albania, Kosovo, Macedonia, Montenegro, and Serbia by 5.4 million people.

See BIRD NAMES, BOW-WOW, CACKLE, CROAK, CROW, CUCKOO, ELEMENTARE WORTSCHÖPFUNG, FANGEN-FINGER-FÜNF.

#### Aleut

Eskimo-Aleut language spoken in Alaska by approximately 150 people.

See {-WR-} IDEOPHONIC ROOT

#### Alliteration

The use of sound repetition in words, phrases or sentences in order to suggest a special nuance of meaning, sometimes of an onomatopoeic or ideophonic character. Frequently, initial consonant sounds of words are repeated in close succession, as in the beautiful bouquet blossomed in the bright sun; your friends will flip-flop fast when facing trouble. Idioms and proverbs usually show alliteration: so many men so many minds; he who laughs last laughs longest (Carson Williams 2011: 42). Company names can also show this type of alliteration: Coca-Cola, Paypal, Dunkin' Donuts. It is especially used in tongue-twisters: Peter Piper picked a peck of pickled pepper; Peter Piper's Practical Principles of Plain and Perfect Pronunciation (Cowdell 2011: 65, 68). It is said that Ludwig Wittgenstein was ridiculed by his schoolmates with the following alliterative jingle: Wittgenstein wandelt wehmütig widriger Winde wegen Wienwärts 'Wittgenstein wends his woeful windy way towards Vienna' (Monk 1991: 16). Tongue-twisters can be used in foreign language training, as in the following examples: Japanese namamugi, namagome, namatamago 'raw wheat, raw rice, raw eggs'; Ibo (an African language) pappa Peter patara papaya pa nye papa Paul 'Peter's Papa peeled a papaya and passed it to Paul's papa' (Cowdell 2011: 70). Alliteration is frequently used in poetry both in oral and signed languages (Kaneko 2011). The following verses are from *The Raven* by E. A. Poe: *Doubting, dreaming* dreams no mortal ever dared to dream before / Followed fast and followed faster till his songs one burden bore / Desolate yet all undaunted, on this desert land enchanted. Vowel alliteration is usually called assonance and consonant alliteration is called consonance.

See also AUTOICONISM. SHE SELLS SEA SHELLS

#### Allolanguage

A term proposed by R. W. Wescott to denote language that is "alienated from conventionally structured speech". The following antitheses opposing language to *allolanguage* can be used to characterize the latter (Wescott 1975b: 19-20): gestureless/co-gestural, digital/analogic, conceptual/perceptual, symbolic/iconic, grammatical/grammarless, business-like/playful, standardized/privatized, denotative/connotative, specific/polysemic.

Concerning the iconicity of *allolanguage*, Wescott says: "allolanguage is perceptual, rather than conceptual, in the sense that it is replete with echoics like the verbs *clink*, *cackle*, and *croak*, which not only echo themselves by means of consonant repetition but also echo non-speech sounds in the environment. This perceptuality is iconic to the extent that speech-sounds exhibit a more than conventionalized resemblance to extra-linguistic realities. The small oral cavity used in producing such modifiers as *itty-bitty* and *teensy-weensy*, both meaning 'very small', is a case in point" (Wescott 1975b: 20). Allolanguage frequently shows palimphony\*, apophony\*, dysphony\* or dysmorphy\*.

#### **Amazigh**

Berber language of North Africa spoken in Morocco by about 3 million people.

See ELEMENTARE WORTSCHÖPFUNG

#### **Amele**

Trans-New Guinea language spoken in the Madang Province of Papua New Guinea by 5,000 people.

See PUFF

#### **American Indian languages**

Sound symbolism is widely attested in Native American languages. E. Sapir reported that, in Wishram, to express the diminutive non-fortis, stopped consonants become fortis and velars become back-palatals; in addition c, tc and tc!, become s, ts, and ts!, and x becomes X. To express the augmentative, fortis consonants become non-fortis stops and s, ts and ts! become, respectively, c, tc and tc!. This can be seen in the following examples:

10 A

aq!o'xl 'knee'/ak!u'xl (diminutive)/aGo'xl (augmentative); itc!i'au 'snake'/ its!i'au (diminutive)/idji'au (augmentative) (Sapir 1911: 243-245).

Diminutive consonant alternation can also have lexicalized meanings (Sapir 1911: 245):

itc!î'nôn 'eagle'→iLts!î'nôn 'bird'

itc!i'laq 'cricket'→its!i'laq 'grasshopper'

This diminutive consonant shifting is widespread in Northwest American Indian languages. It has been observed in Northern Paiute, Nez Perce, Coos, Kalispel, Coeur d'Alene, Twana, Snohomish, Karok, Southern Sierra Miwok, Cocopa, Coos, Luiseño, Yurok, Cree, Diegueño, Lower Chinook, Hupa, Dakota, Tillamook, Sahaptin, Squamish, and Wiyot (Nichols 1971). Wiyot knows a diminutive/augmentative consonant alternation, as in laptohw 'cloud'/lapcohyawoc 'little cloud'/lapchohyawach 'big cloud, storm cloud' (Nichols 1971: 842).

In Nootka, Sapir noticed that when "speaking of or about a child it is customary to add the regular diminutive suffix - 'is to the verb or other forms, even though the word so affected connotes nothing intrinsically diminutive; affection may also be denoted by it" (Sapir 1915: 359). Thus, the normal *qwistci* 'do so!' (*qwis*- 'to do thus'; -tci' second person singular imperative, 'go and ....!) is changed to *qwis'istci* 'do so, little one' when speaking to a child" (Sapir 1915: 359).

"In talking about fat people or people of unusual size, the suffixed element -aq' is used in a manner analogous to the diminutive - 'is. Thus, the normal hint'cilLwe'ini 'he comes it is said' (hin- 'empty' verb stem 'to be, do'; -t'-shortened form of -ini 'to come'; ciL 'inceptive'; we'ini 'quotative') becomes hint'cilLaqwe'ini' (Sapir 1915: 360).

Beck (2008) discusses ideophones in Upper Necaxa Totonac, such as *lam* 'a bright light flashing, a fire flaring up', *lipli* 'a diamond or piece of glass sparkling', *lipilip* 'sun glinting off the water, a mirror, etc.', *limlim* 'sun sparkling off flowing water', *slimslim* 'something twinkling' (Childs 2015: 301). We can see that the /m/-/p/ alternation corresponds to longer vs. shorter, sharper phenomena (*lam* vs. *limp*) or punctual events (*lip*, *lipi*) vs. events with a continuous, static component (*lim*, *slim*). In addition, Beck (2008) observes that the *s/x/lh* alternation is correlated with increasingly more energetic or forceful action, or with the size of an event/participant:

*lanks* 'hand hitting something hard', *lanhx* 'a blow striking with great force', *lanhlh* 'something being kicked with great force' (Childs 2015: 301).

Ideophones\* are also found in Native American languages. In Katuena, a Cariban language of the Amazon basin, *shiiii* is used to suggest falling rain, *wuuuu* 'wind blowing close', *thuuu* 'wind blowing far', *shuuu* 'flowing water' (Smoll 2015: 82, 84, 89). Le Guen (2011) discusses some ideophones in Yucatec Maya. In this language, the pattern CvC suggests a short sound or event as in *p'uch* 'beat', *t'in* 'tighten'; CvvC suggests a long sound or event as in *tsah* 'fry', *tsaah* 'sound of water on embers'; and Cv'vC suggests a sound or event with an internal division, as in *tsa'ah* 'sound made by certain animals when moving', *so'oh* 'to go in a random fashion'. Some Yucatec Maya ideophones are lexicalized: from *tack* 'stick, adhere' the *táak'a'ach* ideophone is obtained and lexicalized as *tak'ach* 'flip-flop'; from *tix* 'rinse, wash out' we can obtain the ideophone *tiihrix'ix* lexicalized as *tirix ta'* 'strong diarrhoea' (Le Guen 2011: 18).

Nuckolls (1996) discusses ideophones in Pastaza Quechua in depth. In this language, sa describes expanded or random movement from or within a locus: sa shitana 'to scatter anything' (146); dzawn suggests an action or event that involves a clustering together of individual agents: dzawn makanakuna 'to fight as a group' (148); t'am means 'to revolve, roll or turn, in a complete revolution': t'am upina 'to drink up by drinking everything from a clay bowl or hollowed out gourd, thus turning it over' (151); polang describes the moment of emergence from underwater to the surface: polang wambuchina 'to raise something from underwater to the surface, e.g., an animal its head' (156); tsupu describes the idea of the sound made at the moment of falling into water: tsupu saltana 'to leap and fall into water, e.g. catfish, freshwater dolphin' (159). In her impressive book, Nuckolls discusses many more ideophones describing types of contact and penetration, opening and closing, falling, deformation, suddenness and completion.

See KATUENA IDEOPHONES, PASTAZA QUECHUA IDEOPHONES, TOTONAC IDEOPHONES,

#### American Sign Language

This sign language is widely used in the United States and most of Anglophone Canada with about 500,000 signers. Many of the signs in this language, as in other sign languages, have a clear iconic nature. For example, the sign for *tree* is a schematization of selected characteristics of a real tree:

trunk shape, verticality, branching, and horizontality (soil). Each one of these features is represented by a corresponding hand and forearm shape. The trunk is represented by the arm in vertical position, the branching by the fingers and the soil by a flat hand (the same sign is made in British Sign Language, see figure B6).

In her detailed study of iconicity in American Sign Language, S. Taub discusses and exemplifies the following devices (Taub 2001: 67-93):

1. Shapes of articulators represent shape of referent.

The movement of articulators represents the movement of the referent. For example, signing the person classifier and moving it upward in a zigzag\* path represents the movement of an actual person upward following a zigzag path, most likely on a winding road up a hill.

2. The shape of the articulator's path represents the shape of the referent.

ASL uses a number of conventional shapes as "traces". For example, index fingertips trace out lines, flat hands with fingers together trace out planes, curved hands trace out curved surfaces, and thumb-and-forefinger circles trace out small cylinders. This path-to-shape method enables signers to make very detailed specifications of shapes beyond the general outlines of fingers, hands, and arms. For example, in order to refer to a floor lamp, the signer might begin with the lamp sign followed by both hands sketching out a vertical cylinder and then both spread hands tracing the shape of the lampshade.

3. Locations in signing space represent locations in mental space. For example, when describing a room, the signer can establish in space the limits of the room and proceed to name objects and place them in the signing-space locations that correspond to their real-world locations.