

## The concentric architecture of the Basque weather lexicon: A cognitive-cultural analysis

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**ABSTRACT:** This article analyses the Basque ethnometeorological lexicon as a motivated system, challenging the view of language as arbitrary signs. Using an integrated framework of Embodied Cognition, Cultural Cognition, Usage-Based Linguistics and the Concentric Theory of Lexical Creation, it examines how this vocabulary arises from perception, culture and communication. A cognitive-structural analysis reveals a highly organised lexicon structured in six concentric circles of metaphorical creation, radiating from the human body to material culture, food, animals, mythology and religion. The lexicon is profoundly iconic, featuring extensive onomatopoeia, and exhibits high granularity, reportedly distinguishing over twelve types of rain. These findings support a moderate linguistic relativity, suggesting that the lexicon actively shapes a community's environmental perception. We conclude that such specialised vocabularies are dynamic archives, preserving traditional ecological knowledge and embodying unique ways of constructing reality.

**KEYWORDS:** Lexicon; weather; Basque; culture; cognition; iconicity.

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## **1. Introduction**

### **1.1. Language, thought and the construction of reality**

The relationship between language, thought and reality constitutes one of the most enduring debates in the human sciences. Captured by the principle of linguistic relativity, this debate centres on whether language is merely a set of arbitrary labels attached to a pre-existing reality or a system deeply rooted in a lived, culturally-situated experience which actively structures perception and thought. This article addresses the core research question of how the interconnected processes of embodied cognition, cultural transmission and language use give rise to a structured, motivated and ecologically-attuned lexicon. By moving the debate from abstract philosophy to concrete analysis, we can examine how a specific speech community conceptualises a domain as universally experienced and culturally vital as the weather, gaining insight into the processes by which language helps construct, rather than simply reflect, a worldview.

This enquiry directly challenges the view of language as a system of arbitrary signs, aligning instead with a cognitive and cultural perspective that sees language as an emergent phenomenon in which “it is impossible for an environment not to be tinged with sociocultural influences” (Bernárdez 2008: 468). We contend that the lexicon is not a random inventory but a complex, organised repository of collective memory, shaped by a cultural process driven by what Gary Palmer terms the “culturally-shaped imagery” (Palmer 1996). This collective culturally-shaped imagery actively forges connections between language, cognition and culture, creating a system that is both a product of and a guide to a community’s experience of the world.

### **1.2. The Basque weather lexicon**

The Basque weather lexicon offers a unique living laboratory for this investigation for several interconnected reasons. First, as a linguistic isolate, it has developed with minimal structural interference from surrounding Indo-European languages, potentially preserving archaic patterns of environmental perception. Second, this linguistic uniqueness is complemented by the Basque-speaking community’s deep ecological adaptation to a diverse Atlantic and Pyrenean environment, fostering an intimate, weather-dependent relationship with traditional lifeways such as farming, shepherding and fishing (Dieguez 2021). Third, this long history of adaptation is encoded in an exceptionally rich and specialised vocabulary which exhibits a remarkable degree of conceptual

granularity in categorising atmospheric phenomena, encapsulating generations of detailed ecological knowledge.

From an ethnolinguistic perspective, this lexicon functions as a rich repository, encapsulating the collective experiences of the linguistic community through the nuanced prism of images and metaphors. A holistic examination reveals a highly structured system. It is a product of a cultural process shaped by collective imagery (Palmer 1996), resulting in a popular lexicon in which many words stand out for their highly descriptive nature. Notably, these words are not arbitrary in their formation; they are motivated, revealing an inherent iconicity —the non-arbitrary relationship between a word’s form and its meaning (Lamb 1999: 35)— which pervades the Basque linguistic landscape.

### **1.3. Previous studies**

The intersection of language, culture and environmental knowledge has been a fertile ground for research across multiple disciplines. In the field of ethnolinguistics and linguistic anthropology, the legacy of Franz Boas and his students, particularly Edward Sapir (1921) and Benjamin Lee Whorf (1956), established the foundational premise that language categories influence perception. Contemporary scholars have moved beyond the deterministic interpretations of the Sapir-Whorf hypothesis, instead pursuing what is now termed linguistic relativity, the investigation of how habitual patterns of language influence habitual patterns of thought (Lucy 1992; Gumperz & Levinson 1996). Within this tradition, the study of specialised lexicons has proven particularly insightful, with research on ethnobotany (Berlin 1992), ethnogeography (Burenhult & Levinson 2008) and ethno-meteorology demonstrating how specialised terminologies encode sophisticated systems of practical and cultural knowledge.

Research specifically on weather and landscape lexicons has flourished, revealing how different speech communities’ segment environmental continua in ways that reflect both cognitive universals and culturally specific concerns. For instance, studies of the Tzeltal Maya language (Brown 2008) and the North Saami language (Krupnik 2010) have shown how close environmental adaptation yields elaborate terminological systems for phenomena which speakers of global languages often conceptualise with a small set of generic terms. These studies highlight that lexical richness in a given domain is not simply a reflection of ecological necessity but also of cultural salience and linguistic tradition (Mark *et al.* 2011).

Turning to the Basque language, a robust tradition of dialectology and lexicography has produced foundational works such as the *Orotariko Euskal Hiztegia* (Mitzelena 1987–2005), a comprehensive dictionary which catalogues the immense dialectal variation across the Basque Country. Moreover, ethnographic studies, particularly those by the ethnographer José Miguel de Barandiaran (1972), have documented traditional Basque beliefs, practices and oral traditions, including those related to weather, the seasons and pastoral life. These works provide an invaluable repository of cultural data. However, they are primarily descriptive or encyclopaedic in nature.

There have also been linguistic analyses of specific semantic fields in Basque. Research on the Basque lexicon of motion (Ibarretxe-Antuñano 2004) has applied cognitive linguistic frameworks to uncover the conceptual structures motivating Basque lexical and grammatical patterns. More recent work has begun to explicitly address environmental knowledge encoded in Basque. For example, the author’s own previous studies (Dieguez 2021, 2022) have analysed specific subsets of the weather lexicon, identifying patterns of iconicity and metaphor. Yet what remains absent is a comprehensive, theoretically unified analysis of the Basque ethnometeorological lexicon as a structured system. Previous studies have not systematically addressed how the lexicon is architecturally organised—how individual terms relate to one another within a coherent, motivated framework or integrated cognitive, embodied and cultural perspectives into a single explanatory model. The present study aims to fill this gap by applying a synthesised theoretical framework to the analysis of the entire weather lexicon, thereby moving beyond isolated description to reveal the dynamic processes of lexical creation and cultural transmission which have shaped it.

#### **1.4. Theoretical framework and article structure**

To dissect this motivated system, a holistic theoretical framework is required—one that integrates the embodied, cultural and usage-based forces which give it shape. This article therefore introduces and applies a synthesised four-pillar model. This framework provides the theoretical grounding to analyse how the speech community, guided by its culturally-shaped imagery, acts as collective *artisaauak* ‘craftspeople’, systematically sculpting the raw material of embodied experience into a structured cultural edifice.

Crucially, this process of lexical creation is not passive borrowing but active cultural craftsmanship, systematically organised through what we term the Concentric Theory of Lexical Creation (Pillar 4). This theory posits that languages construct their lexicons concentrically—from the familiar to the intricate, much like ripples formed when a stone is cast into water. This

concentric model provides the architectural blueprint for this cognitive and cultural construction, revealing the lexicon not as a static inventory but as a dynamic, structured system shaped by the collective, yet initiated by individual speakers whose innovations must gain communal approval to endure (Rodríguez Adrados 1974).

It is argued that the Basque ethnometeorological lexicon is a prime example of such linguistic craftsmanship, providing strong evidence for a view of language as a primary tool for constructing a worldview. To substantiate this claim, the article is structured as follows: Section 2 outlines the integrated four-pillar theoretical framework in detail. Section 3 details the methodology used to analyse the lexicon. Section 4 presents the core findings, mapping the lexicon's architecture according to the concentric model of lexical creation. Section 5 discusses the broader implications of these findings for linguistic theory, particularly regarding iconicity and linguistic relativity. Finally, section 6 concludes by reflecting on the role of language as a repository of cultural knowledge and its importance for language preservation.

## **2. An integrated four-pillar theoretical framework**

These four pillars are not independent but mutually reinforcing. Embodied cognition (Pillar 1) provides the universal perceptual ground, which is then filtered and structured by cultural cognition (Pillar 2). Usage-based dynamics (Pillar 3) explain how these culturally-shaped concepts become conventionalised through communication, while the Concentric Theory (Pillar 4) provides the architectural model which organises the resulting lexicon into a coherent system.

To analyse a complex, culturally-embedded lexicon, a multi-dimensional framework is essential. Single-pillar analyses—those focusing exclusively on universal cognitive mechanisms or solely on particular cultural influences—are insufficient, as they fail to capture the dynamic integration of several key dimensions: the interaction of mind, body, culture, context, and communication. This article therefore adopts a synthesised four-pillar model that provides a holistic analytical lens, treating the lexicon as an emergent phenomenon arising from the interaction of these mutually reinforcing dimensions. In doing so, it engages with recent developments in cognitive linguistics that emphasize the contextual nature of metaphor (Kövecses 2015) and its hierarchical structure (Casasanto 2017), thereby situating the study within current field-wide debates.

## 2.1. Pillar one: The embodied foundations of meaning

The theory of Embodied Cognition posits that human thought is grounded in and structured by our sensorimotor experiences (Lakoff & Johnson 1980; Barsalou 1999). Language is not an abstract system of symbols but a motivated one reflecting how we physically interact with our environment (Ibarretxe-Antuñano and Valenzuela 2021). The weather domain is particularly illustrative of this principle, as abstract meteorological concepts are understood through cognitive structures derived from bodily experience (Barsalou 2008).

Conceptual Metaphors and Image Schemas: These structures provide the cognitive scaffolding for understanding complex phenomena in terms of more concrete experiences. For example, the Basque lexicon is built upon primary metaphors like PRECIPITATION IS LIQUID FLOW, grounded in the universal tactile experience of rain, which motivates the conceptualisation of rain in terms of falling, pouring, and flowing. Image schemas, such as CONTAINER and PATH, provide the pre-conceptual building blocks for such metaphors.

However, to fully account for the complex, layered nature of the weather lexicon, we must consider not just the presence of these metaphors but their hierarchical organisation. As Daniel Casasanto (2017) argues, mental metaphors are structured in a hierarchy of abstraction. At the bottom are specific metaphors (e.g., *RAIN IS A FLOWING LIQUID*), which are directly grounded in sensorimotor experience. These feed into intermediate metaphors that are more schematic (e.g., *WEATHER IS A MOVING ENTITY*), which in turn instantiate a small set of superordinate metaphors (e.g., *EVENTS ARE ACTIONS*) that structure abstract reasoning across domains. This hierarchical model explains how a specific embodied experience can scale up to shape broad patterns of thought. For the Basque lexicon, this means that a term like *euria ari du* ‘it is doing rain’ is not an isolated idiom but a surface-level instantiation of a deep, hierarchically-organised cognitive structure which links embodied experience to abstract conceptualisation. This hierarchy also provides the cognitive rationale for the Concentric Theory (Pillar 4): The innermost circles (Body, Tools) provide the most specific and concrete source domains for the lowest-level metaphors, which then scaffold the more abstract concepts found in the outer circles (Mythology, Religion).

In addition to the conceptual metaphors which map entire domains (e.g., PRECIPITATION IS LIQUID FLOW), many expressions in the Basque weather lexicon are grounded in *resemblance metaphor*. Unlike conceptual metaphors, which establish systematic correspondences between abstract and concrete domains, resemblance metaphors are based on a perceived one-to-one

similarity between two entities. As Lakoff and Turner (1989: 134) note, these metaphors are often “one-shot” images: A cloud is seen as resembling a human figure, an animal, a mountain or a piece of cloth. In cognitive linguistics, such metaphors are understood as operating at a more specific, often perceptual level, and they frequently serve as the basis for folk taxonomies and descriptive terminology. For the Basque weather lexicon, resemblance metaphor is particularly productive in naming cloud formations (e.g., *balen-odei* ‘whale-cloud’), in which the visual shape of the cloud invites comparison to an animal entity. While conceptual metaphors provide the structural scaffolding for understanding weather processes, resemblance metaphors enrich the lexicon with vivid, culturally salient imagery. Crucially, Gary Palmer’s concept of *imagery* extends this view by defining it as the capacity to construe the same situation in alternative ways. This imagery, while rooted in universal embodiment, is profoundly shaped and structured by culture and personal history, guiding which specific experiences become the source for linguistic expression (Palmer 1996: 75).

## **2.2. Pillar two: Cultural cognition and shared knowledge**

While cognition is embodied, it is also culturally situated. Cultural Cognition is a group-level, collective phenomenon which emerges from the interaction between individuals (Sharifian 2017). Mechanisms such as joint attention and cumulative cultural evolution —the “ratchet effect” described by Tomasello (1999)— shape the lexicon as a co-constructed product. Knowledge is not confined to individual minds but is distributed across people, artifacts and the environment itself (Hutchins 1995). Basque weather knowledge, for instance, has been distributed among farmers reading cloud patterns, sailors interpreting wind shifts and shepherds navigating mountain weather. The vital mechanism linking large-scale cultural structures to individual cognitive dispositions is Pierre Bourdieu’s concept of *habitus*.

Systems of durable and transposable dispositions, structured structures predisposed to function as structuring structures; that is, as generating and organizing principles of practices and representations which can be objectively adapted to their goals without presupposing a conscious pursuit of ends or an explicit mastery of the operations necessary to attain them; objectively “regulated” and “regular” without in any way being the product of obedience to rules, and, moreover, collectively orchestrated without being the product of the organizing action of a conductor (Bourdieu 1994: 88).

For Basque speakers in agropastoral communities, the habitus cultivates a perceptual readiness to notice subtle atmospheric changes, an attunement which is both the cause and the consequence of the lexicon's detailed granularity.

Zoltán Kövecses's (2015) work on the contextual nature of metaphor provides a crucial mechanism for understanding how the habitus operates. Kövecses demonstrates that metaphorical meaning is not fixed but is dynamically shaped by context at multiple levels. This framework allows us to analyse how the Basque weather lexicon is shaped by:

1. **Situational Context:** The immediate physical environment (e.g., the specific weather event being described), the social setting (e.g., a farmer warning a neighbour vs. a poetic text) and the communicative purpose (e.g., practical forecasting vs. storytelling) all influence which metaphorical resources are deployed.
2. **Discourse Context:** The local linguistic environment, including previously used metaphors and the general topic of conversation, guides the selection and extension of terms. For example, a metaphor drawn from the *Animal* circle (e.g., *ekaitza otsoa da* 'the storm is a wolf') can trigger a cascade of related metaphors within a single narrative.
3. **Conceptual-Cognitive Context:** This encompasses the shared knowledge and cognitive dispositions of the community—precisely what is captured by the concept of *habitus*. The internalised dispositions of the Basque agropastoral community make certain metaphorical mappings (e.g., from sheep behaviour to cloud formations) highly salient and easily understood, while others remain opaque.
4. **Body Context:** Even the immediate physical state of the speaker (e.g., being cold, wet or sheltered) can affect metaphor choice, highlighting the ongoing interplay between embodied experience and contextual factors.

By integrating Kövecses's model, we can move beyond simply stating that culture shapes metaphor to explaining the precise contextual dynamics—from the immediate situation to the deep-seated habitus—that drive the conventionalisation, variation and creative extension of the Basque weather lexicon.

### **2.3. Pillar three: Usage-based dynamics**

Usage-Based Linguistics posits that language structure emerges directly from patterns of use (Langacker 1990; Ibarretxe-Antuñano & Valenzuela 2021). The lexicon is not a static inventory

but a dynamic system shaped by cognitive processes which occur during communication. Three central mechanisms drive the conventionalisation and evolution of terms:

First, chunking refers to the process by which frequently co-occurring words fuse into a single processing unit. A sequence of words is stored and retrieved from memory as a whole, increasing processing fluency; this explains how multi-word expressions become established formulas (Ibarretxe-Antuñano & Valenzuela 2021: 53).

Second, through automatization and entrenchment, high-frequency expressions become cognitively entrenched, requiring minimal processing effort. This creates preferred linguistic pathways which speakers are more likely to follow, reinforcing the conventions of the speech community (Ibarretxe-Antuñano & Valenzuela 2021: 53).

Third, analogical extension allows speakers to creatively extend existing linguistic patterns to new or similar contexts. A metaphor used to describe one type of wind, for example, can be analogically extended to describe another, creating novel yet readily understandable expressions which maintain the system's internal coherence and productivity.

#### **2.4. Pillar four: The concentric theory of lexical creation**

The fourth pillar provides the architectural model which organises the findings of the previous three pillars into a coherent system. While embodied cognition (Pillar 1) supplies the universal grounding, cultural cognition (Pillar 2) filters this through shared dispositions (*habitus*) and usage-based dynamics (Pillar 3) drive conventionalisation, the Concentric Theory explains *how these processes converge to produce a structured lexicon*. Its core principle is that lexical creation is a form of *arotitzak* (*aro* + *hitz* 'weather word'). The speech community takes the raw, natural material of embodied experience (*hitz gordina*) and transforms it (*eraldaketa*) through cultural work into a refined, useful and meaningful cultural artifact. This transformation is not random but follows a predictable architectural plan: A series of concentric circles radiating outwards from the most immediate and concrete domains to more distant and abstract ones.

Theoretical novelty: This concentric model departs from previous typologies of metaphor sources (e.g., the great chain of being) in several ways. First, it is explicitly domain-specific and culturally diagnostic: The circles are not universal but emerge from the particular cognitive and cultural landscape of the Basque speech community, reflecting its agropastoral history, material culture and cosmological layers. Second, it is dynamic and process-oriented: The circles represent stages of *cultural transformation* rather than static categories. A term originating in the *Body* circle

may, through usage-based analogical extension, migrate outwards to describe phenomena in the *Mythology* circle, and the process can be traced. Third, it is cognitively grounded in the hierarchical structure of metaphor (Casasanto 2017): The innermost circles (Body, Food, Tools) correspond to the most specific, sensorimotor metaphors, while the outer circles (Mythology, Religion) instantiate more abstract, superordinate metaphors which depend on the lower levels for their experiential basis.

1. Body: The innermost circle. As our most immediate experiential domain, body parts (*begi* ‘eye’, *hanka* ‘leg’) serve as the foundational source for metaphorical extensions. This circle provides the most concrete, universally available source material.
2. Food: Culinary metaphors. Terms related to food and cooking (*salda* ‘soup’, *ziztor* ‘sausage’) reflect central cultural practices and provide rich sensory analogies. Food, as a domain of both bodily sustenance and cultural elaboration, serves as a bridge between the embodied and the social.
3. Tools & Clothes: The domain of material culture. Everyday objects and artifacts —*zirtzil* ‘rag’, *burruntzi* ‘iron wedge’— are used to conceptualise and describe weather phenomena. This circle represents the first layer of cultural mediation, in which embodied experience is extended through culturally specific artifacts.
4. Animals: Fauna from the agropastoral environment. The characteristics and behaviours of animals —*azeri* ‘fox’, *kuku* ‘cuckoo’— serve as a key conceptual resource. This circle captures the deep integration of human and animal ecologies in traditional Basque life.
5. Mythology: Pre-Christian cosmological frameworks. This circle preserves an older, matriarchal-naturalist worldview, with terms linked to deities like *Mari* and concepts like *Ortzi* ‘sky/storm god’. It represents a layer of abstraction in which natural forces are personified within a coherent belief system.
6. Religion: Christian influences. This outermost layer reflects later cultural contact, introducing new metaphorical mappings (e.g., saints, religious holidays) which coexist with and sometimes overwrite older mythological concepts.



**Figure 1**

The concentric theory of lexical creation: The six circles. Source: Own elaboration

Integration with the other pillars: The concentric architecture is not a standalone taxonomy. It is the output structure which emerges from the interplay of the other three pillars. Embodied cognition (Pillar 1) explains why the innermost circles are universally grounded; cultural cognition (Pillar 2), particularly through the *habitus*, explains why specific circles (e.g., Animals) become exceptionally elaborated in Basque; and usage-based dynamics (Pillar 3) explain how terms shift

between circles over time through analogical extension and entrenchment. The Concentric Theory thus provides a unified, empirically testable model of how a culturally significant lexicon is built layer by layer, from the body outwards, through the cumulative work of generations of speakers.

This integrated four-pillar framework allows for a comprehensive analysis of the Basque weather lexicon, demonstrating how each term is simultaneously a cognitive structure, a cultural artifact and a dynamic usage pattern. The framework's originality lies not in its individual components but in their synthesis and in the concentric theory which gives this synthesis a coherent architectural form. By grounding the concentric circles in the hierarchical structure of metaphor (Casasanto 2017) and the contextual dynamics of cultural cognition (Kövecses 2015), the model offers a replicable approach for analysing culturally embedded lexicons beyond the weather domain. It shows that lexical creation is a form of cultural craftsmanship —*arotitzak* 'weather words'— in which universal cognitive capacities are channelled through community-specific dispositions to produce a structured, layered and deeply meaningful vocabulary.

### **3. Methodology: A cognitive-structural analysis**

The complexity of the research question requires a multi-faceted, interdisciplinary methodology which combines the analytical tools of cognitive linguistics with the contextual insights of ethnographic and corpus analysis. This approach allows us to investigate the lexicon not as a static list of words but as a dynamic system embedded in cognitive and cultural practices.

#### **3.1. Corpus Compilation and triangulation**

The reliability of this analysis rests on a robust and comprehensive corpus, which was meticulously compiled from a wide range of diverse sources to mitigate the inherent biases of any single source and to ensure coverage of both historical depth and contemporary usage.

As detailed in Dieguez (2022), the corpus construction relied on methodological triangulation, drawing from the following source types:

- **Oral and Dialectological Sources:** This includes data from Euskaltzaindia's (the Royal Academy of the Basque Language) *Euskararen Herri Hizkeren Atlasa* (Atlas of Basque Popular Dialects, 2008), which provided a foundational dataset of 1,740 terms from 145 locations, offering a geographical snapshot of dialectal variation. This was supplemented with data from ethnographic fieldwork by researchers like Iñaki Gaminde, who

documented the living, oral usage of meteorological terms among native speakers, capturing nuances often absent from written sources.

- **Historical and Foundational Written Sources:** The cornerstone of the historical analysis is Resurrección María de Azkue's seminal *Diccionario vasco-español-francés* (1905–1906), which alone provided 1,280 weather terms, serving as a critical record of the lexicon at the turn of the twentieth century. This was complemented by other specialised lexicons and classic literary works, which preserve archaic and culturally salient terms.
- **Contemporary and Journalistic Sources:** To track the vitality and evolution of the lexicon, the corpus also incorporated modern texts, including digital journalism, weather forecasts in Basque and contemporary literature. This allows the analysis to account for processes of lexical retention, innovation and shift in the face of technological and social change.

This multi-source strategy ensures that the analysis is not statically rooted in a single period or register but is dynamically grounded in the full linguistic reality of Basque, from its most traditional roots in rural oral culture to its modern adaptations in a digital society. By cross-referencing terms across these sources, it is possible to distinguish between widely entrenched, core concepts and those that are peripheral or geographically limited, thereby constructing a more accurate and nuanced model of the Basque mental landscape of weather.

### **3.2. Analytical approach**

The primary method employed in this study is a cognitive-structural analysis of the Basque ethnometeorological lexicon. This approach involves a detailed, systematic examination of a large corpus of weather-related terms to identify and model the underlying cognitive structures (such as conceptual metaphors and image schemas), cultural motivations and the overarching organisational principles which give the lexicon its coherence.

The investigation began with a phase of identification and deconstruction, grounded in the principles of embodied cognition (Pillar 1) and concentric theory (Pillar 4). Here, the analytical gaze was turned inwards to the linguistic unit itself. Each term was systematically deconstructed into its constituent semantic parts, a process which served to isolate its conceptual source domain—whether rooted in the Body, Tool or Animal, for instance—and to specify the precise metaphorical or metonymic mapping at work (such as conceptualising *Heavy rain is a sack of*

*grain*). This initial deconstruction was not an end in itself but a necessary archaeology, tracing the conceptual path from embodied experience to lexical form.

This micro-level analysis, however, revealed only the *potential* for meaning. To understand how that potential was actualised and stabilised, the analysis moved to a phase of contextualisation and correlation. Here, the terms were re-embedded within their living socio-cultural and usage-based environments. The analytical focus expanded to encompass the terms' distribution across dialects, their frequency and function within specific genres (contrasting, for example, the pragmatic needs of oral tradition with the descriptive norms of journalism) and their structural ties to the community's agropastoral practices. By engaging with cultural cognition (Pillar 2) and usage-based dynamics (Pillar 3), this phase illuminated how shared cultural models and recurrent patterns of communication act as forces of conventionalisation, determining not just which terms persist, but which acquire the status of a culturally salient category.

The analytical arc culminated not in a simple aggregation of findings, but in a synthesis and architectural modelling. The insights from the deconstruction of individual terms and their contextualisation within practice were brought together to construct the concentric model itself. This final, integrative phase served as a formal test of the model's explanatory power. By mapping the analysed terms onto the model, the analysis assessed the relative productivity of each concentric circle and, more critically, mapped the dynamic interactions *between* them. The result was a systematic architectural diagram of the entire ethnometeorological lexical system, revealing not just its constituent parts, but the principles of coherence that give it structure and stability.

### **3.3. Framework application**

The analysis systematically maps the collected terms to the six concentric circles outlined in "Concentric theory of lexical creation" (Dieguez 2021). Each term and conceptual pattern is then interpreted through the lens of the integrated four-pillar framework. This allows us to explain *why* certain metaphorical mappings occur (embodied and cultural cognition), *how* they become conventionalised (usage-based dynamics) and *what* structural logic they follow (the concentric model). This systematic application moves beyond mere description to provide a causal explanation for the lexicon's structure and content.

In applying this framework to each term, we ask: (1) What embodied experience grounds this metaphor? (Pillar 1); (2) what cultural knowledge or habitus makes this mapping salient? (Pillar

2); (3) how has this term become conventionalised through use? (Pillar 3); and (4) where does this term fit within the concentric architecture? (Pillar 4).

#### **4. The concentric architecture of the Basque weather lexicon: Analysis and findings**

This section analyses the Basque ethnometeorological lexicon according to the six concentric circles identified in Section 2. We will see how raw sensory input is carved (*zizelkatu*) into bodily metaphors, how domestic life provides the tools and textures for construction and how mythological beliefs are architected into explanatory frameworks. This section presents the core analysis of the Basque weather lexicon, moving systematically through each of the six concentric circles. By providing concrete examples from the corpus, we will demonstrate how embodied perception, cultural context and patterns of usage interact to create a richly motivated and highly structured vocabulary. The findings reveal a system in which the creation of meaning radiates outwards, from the immediacy of the human body to the encompassing frameworks of mythology and religion.

##### **4.1. The first circle: The Body**

The human body serves as the foundational source domain for lexical creation, providing a universal and immediate set of concepts to describe the external world. Abstract or complex phenomena are made comprehensible by mapping them onto familiar anatomy and sensory experience. Table 1 lists representative terms: *argi-begi* ‘eye of light’—a poetic term for sunrise or a break in clouds; *laino buruhandi* ‘big-headed cloud—personifying a large cloud formation; *laino-hanka* ‘cloud leg’—a column-like rain pillar; and *hanka mehe* ‘thin leg’, for fine, light rain. These metaphors are grounded in visual, tactile and spatial perception—the organ of sight becomes the source of illumination, the vertical support of a leg models rain columns and slender limbs evoke fine droplets. Culturally, this personification reflects a worldview in which nature is animated and relatable, turning weather into a social partner. In everyday speech, bodily terms are the most entrenched and frequent, forming the core vocabulary accessible to all speakers, which makes them particularly effective for intergenerational transmission of weather knowledge. As the innermost circle, the body establishes the fundamental cognitive principle by which we comprehend the unknown through the known, beginning with our own physical existence. It

provides the essential raw material from which the *arotitzak* ‘weather words’ build all subsequent layers.

**Table 1**

The first circle: The Body – Foundational metaphors in the Basque weather lexicon

Term (Basque)	Meteorological term	Embodied grounding	Cultural salience	Usage patterns	Concentric architecture
<i>argi-begi</i>	Sunrise / break in clouds	Visual perception	Poetic expression	Conventionalised	Core bodily experience
<i>laino buruhandi</i>	Large, imposing cloud	Physical form	Personification	Common in descriptions	Body as reference point
<i>laino-hanka</i>	Column of rain (rain shaft)	Spatial orientation	Structural analogy	Descriptive contexts	Body as support metaphor
<i>hanka mehe</i>	Fine, light rain	Tactile experience	Fine discrimination	Specialised use	Body as measurement standard

Examples in context. Basque-English (Dieguez 2021)		
<i>argi-begi</i>	<i>Goizean, lainoaren artetik argi-begi bat agertu zen</i>	‘In the morning, an <i>eye of light</i> appeared through the clouds’
<i>laino buruhandi</i>	<i>Hodei beltz eta laino buruhandi bat dator ekaitzarekin</i>	‘A black, <i>big-headed cloud</i> is coming with the storm’
<i>laino-hanka</i>	<i>Urrunean laino-hanka ikusten da, euria ari du han</i>	‘In the distance you can see a <i>cloud leg</i> ; it’s raining over there’
<i>hanka mehe</i>	<i>Hanka mehea da, baina dena blaitu du</i>	‘It’s raining in <i>thin legs</i> , but it has soaked everything’

#### 4.2. The second circle: Food

Culinary metaphors project the multisensory experiences of cooking and eating —texture, temperature, consistency and visual appearance— onto meteorological phenomena. As shown in Table 2, *elur-salda* ‘snow soup’ describes slushy snow by evoking the texture of broth; *izotz-txistor* ‘ice sausage’ likens an icicle to a familiar sausage shape; *elur-lapats* ‘snow curd’ captures granular snow through a dairy production term; and *elur-pikor* ‘snow grain’ uses agricultural vocabulary for small pellet-like snow or graupel. The prominence of such terms reflects the centrality of

gastronomy in Basque cultural identity, embedding meteorological knowledge within foodways. These metaphors often carry affective dimensions (aesthetic appreciation or distaste) and appear frequently in informal, seasonal contexts tied to agricultural cycles. The food circle represents the internalisation of the environment through consumption, completing a movement from external observation to embodied incorporation. Culinary metaphors project the multisensory experiences of cooking and eating —texture, temperature, consistency and visual appearance— onto meteorological phenomena. As shown in Table 2, *elur-salda* ‘snow soup’ describes slushy snow by evoking the texture of broth; *izotz-txistor* ‘ice sausage’ likens an icicle to a familiar sausage shape; *elur-lapats* ‘snow curd’ captures granular snow through a dairy production term; and *elur-pikor* ‘snow grain’ uses agricultural vocabulary for small pellet-like snow or graupel. The prominence of such terms reflects the centrality of gastronomy in Basque cultural identity, embedding meteorological knowledge within foodways. These metaphors often carry affective dimensions (aesthetic appreciation or distaste) and appear frequently in informal, seasonal contexts tied to agricultural cycles. The food circle represents the internalisation of the environment through consumption, completing a movement from external observation to embodied incorporation.

**Table 2**

The second circle: Food – Foundational metaphors in the Basque weather lexicon

<b>Term (Basque)</b>	<b>Meteorological term</b>	<b>Embodied grounding</b>	<b>Cultural salience</b>	<b>Usage patterns</b>	<b>Concentric architecture</b>
<i>elur-salda</i>	Slushy snow	Texture perception	Culinary traditions	Descriptive term	Food as sensory analogy
<i>izotz-ziztor</i>	Icicle	Shape recognition	Local gastronomy	Conventionalised	Cultural food references
<i>elur-lapats</i>	Fine granular snow	Granular texture	Dairy production	Specialised use	Agricultural products
<i>elur-pikor</i>	Sleet / graupel	Size comparison	Farming vocabulary	Technical description	Staple foods as metric

Examples in context. Basque-English (Dieguez 2021)		
<i>elur-salda</i>	<i>Elur-salda zikin horrek galtzak busti dizkit</i>	‘That dirty <i>snow soup</i> has soaked my trousers’
<i>izotz-ziztor</i>	<i>Hego haizearekin, izotz-txistorrak teilatuetatik erortzen hasi dira</i>	‘With the south wind, the <i>ice sausages</i> have started falling from the roofs’

<i>elur-lapats</i>	<i>Goizean elur-lapatsa ari zuen, ezin izan dugu eskiatu</i>	'The snow was too slushy in the morning, so we couldn't ski'
<i>elur-pikor</i>	<i>Elur-pikorrak aurpegian jotzen zidan, min apur bat emanez</i>	'The snow grains were hitting my face, stinging a bit'

### 4.3. The third circle: Tools & Clothes

Extending the body into material culture, this circle draws on everyday objects, tools and clothing from a pre-industrial, agrarian society. Table 3 lists examples: *huri-zirtzil* 'ragged rain'—a persistent drizzle compared to a wet rag; *izotz-burruntzi* 'ice wedge'—using a blacksmith's tool for an icicle's sharp shape; *elur-mataza* 'snow skein'—a tangled snowflake cluster evoking textile crafts; and *izotz-kandela* 'ice candle'. These metaphors are grounded in tactile and visual memories of handling tools and fabrics. They reflect specific material practices and show strong regional variation, whereby coastal communities may favour fishing implements, while inland areas draw on farming tools, thus mapping the economic geography of the Basque Country through weather language. As the first step outwards from the body, the tools-and-clothes circle demonstrates how cultural artifacts become cognitive extensions of bodily experience, creating a bridge between physical sensation and technological mediation.

**Table 3**

The third circle: Tools and Clothes – Foundational metaphors in the Basque weather lexicon

Term (Basque)	Meteorological term	Embodied grounding	Cultural salience	Usage patterns	Concentric architecture
<i>huri-zirtzil</i>	Persistent light rain	Tactile experience	Domestic life	Descriptive use	Material culture domain
<i>izotz-burruntzi</i>	Icicle (sharp)	Visual shape	Blacksmith tools	Conventionalised	Tools as analogy source
<i>elur-mataza</i>	Large snowflake (cluster)	Manual manipulation	Textile crafts	Poetic usage	Domestic objects as reference
<i>izotz-kandela</i>	Icicle	Visual similarity	Household items	Common metaphor	Everyday artifacts

Examples in context. Basque-English (Dieguez 2021)

<i>huri-zirtzil</i>	<i>Huri-zirtzil honek egun osoan ari eta ari</i>	'This rag rain has been going on all day; nothing
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	<i>du; ezer ez da lehortzen</i>	dries'
<i>izotz-burruntzi</i>	<i>Begira izotz-burruntzi horiei, labanak dirudite</i>	'Look at those <i>ice wedges</i> ; they look like daggers'
<i>elur-mataza</i>	<i>Elur-mataza erori zen nire eskularruaren gainean, marrazki eder bat eginez</i>	'A <i>snow skein</i> fell on my glove, with a beautiful pattern'
<i>izotz-kandela</i>	<i>Izotz-kandelak taka-taka ari dira erortzen, urtzen ari direlako</i>	'The <i>ice candles</i> are dripping drop by drop because they are melting'

#### 4.4. The fourth circle: Animals

Animal-based metaphors dominate the Basque weather lexicon, reflecting the deep agropastoral roots of Basque society. Table 4 presents twelve terms which draw on domestic and wild fauna. For example, *oilo-hanka* 'chicken leg' describes the arch of a rainbow; *ahuntz-haize* 'goat wind' and *atun-haize* 'tuna wind' name winds by associating them with livestock or maritime life; *astokarrerak* 'donkey races' evokes the thunderous sound of heavy rain; *kuku-izerdi* 'cuckoo sweat' denotes very fine rain based on the folk belief that the cuckoo is an idle bird which barely sweats; and *euli-pixa* 'fly piss' refers to minimal drizzle. These metaphors are rooted in direct sensory experience: visual shape *ahari-buruak* 'ram heads' for cumulus clouds, auditory intensity (donkey hooves) and tactile minimality (fly urine). Culturally, they encode folk beliefs and integrate both domestic animals (chickens, donkeys, goats) and wild fauna (foxes, cuckoos, snails). Coastal communities contribute references like *atun-haize*, while inland areas draw more on livestock. Animals serve as a conceptual bridge between the domestic sphere and untamed natural forces, showcasing the community's deep observational prowess.

**Table 4**

The fourth circle: Animals – Foundational metaphors in the Basque weather lexicon

Term (Basque)	Meteorological term	Embodied grounding	Cultural salience	Usage patterns	Concentric architecture
<i>oilo-hanka</i>	Rainbow	Visual pattern recognition (arc shape)	Poultry farming, familiar anatomy	Common descriptive analogy	Domestic animals
<i>ahuntz-haize</i>	Northeast wind	Bodily sensation of wind direction	Pastoral life, animal behaviour	Regional weather lore	Livestock references

<i>atun-haize</i>	West wind	Force and persistence perception	Maritime fishing culture	Coastal communities' usage	Sea fauna associations
<i>karakol-haize</i>	Whirlwind	Visual spiral movement	Land snail common in fields	Descriptive metaphor	Small fauna behaviour
<i>ahari-buruak</i>	Large cumulus clouds	Visual bulk and shape	Animal husbandry, familiar shapes	Common visual description	Domestic animal morphology
<i>zaldi gaineko</i>	Fast-moving rain clouds	Perception of speed and motion	Equestrian culture	Poetic/descriptive usage	Animal movement patterns
<i>oilo-luma</i>	Large fluffy snowflake	Visual lightness and texture	Poultry common in rural life	Common analogy	Animal-derived materials
<i>kuku-elur</i>	Spring snow	Temporal association	Bird migration patterns	Seasonal reference	Bird phenology
<i>kuku-izerdi</i>	Very fine rain	Minimal moisture perception	Cultural belief about cuckoo's idleness	Cultural metaphor	Animal humour/folk belief
<i>asto-karrerak</i>	Heavy rain/hail downpour	Auditory intensity (sound of hooves)	Donkey as work animal	Vivid descriptive expression	Animal sound metaphors
<i>(e)ulipixa</i>	Minimal drizzle	Almost imperceptible moisture	Common insect, minimal output	Colloquial expression	Insect scale reference
<i>azeri-ezkontza</i>	Sunshower	Paradoxical sensory experience	Fox as trickster in folklore	Proverbial expression	Animal trickster folklore

Examples in context. Basque-English (Dieguez 2021)		
<i>oilo-hanka</i>	<i>Euriaren ondoren, oilo-hanka eder bat agertu zen itsas aldean</i>	'After the rain, a beautiful <i>chicken leg</i> appeared over the sea'
<i>ahuntz-haize</i>	<i>Ahuntz-haize dator iparraldetik, hotz handia ekarriko du</i>	'The <i>goat wind</i> is coming from the north; it will bring intense cold'
<i>atun-haize</i>	<i>Atun-haizearekin itsasoa baretu ohi da</i>	'With the <i>tuna wind</i> , the sea usually calms down'
<i>karakol-haize</i>	<i>Bat-batean karakol-haize bat sortu zen,</i>	'Suddenly a <i>snail wind</i> arose, tossing the straws

	<i>lastoak gora botaz</i>	upward'
<i>ahari-buruak</i>	<i>Ahari-buruak ikusten dira mendi atzean; euria egingo du laster</i>	'Ram heads are visible behind the mountain; it will rain soon'
<i>zaldi gaineko</i>	<i>Zaldi gaineko laino horiek goitik behera bustiko gaituzte</i>	'Hose mist on horseback will get us wet through'
<i>oilo-luma</i>	<i>Oilo-luma erori zen nire sudur gainean, eta urtu egin zen</i>	'A chicken feather fell on my nose and melted'
<i>kuku-elur</i>	<i>Kuku-elurra izan da gaur, maiatzean izateko arraroa</i>	'It was cuckoo snow today, unusual for May'
<i>kuku-izerdi</i>	<i>Kuku-izerdia ari du, ia ez zara bustitzen</i>	'It's cuckoo sweat; you hardly get wet'
<i>asto-karrerak</i>	<i>Asto-karrerak entzuten dira kanpoan; tira, jaitsi behar dugu</i>	'We hear donkey races outdoor; well, we need to go down'
<i>euli-pixa</i>	<i>Euli-pixa batek ez dizu ezer egingo, lasai etorri</i>	'A fly piss won't do anything to you; come on out'
<i>azeri-ezkontza</i>	<i>Gaur azeri-ezkontza izan dugu: eguzkia eta euria batera</i>	'Today there was a fox wedding: sun and rain together'

#### 4.4.1. Deep dive case study: Azeri-ezkontza

The term *azeri-ezkontza* 'fox wedding' refers to a sun shower, rain falling while the sun shines. This expression exemplifies conceptual blending (Fauconnier & Turner 2002). The meteorological event creates cognitive dissonance (sun and rain together). Basque folklore supplies the trickster fox (*azeria*) and the wedding frame (*ezkontza*), a joyful yet chaotic event. The blend resolves the paradox by framing the contradictory weather as a fox's wedding, in which sun and rain become participants in a trickster's celebration. This blend is compressed into the compound *azeri-ezkontza*, reinforced through proverbs such as *Azeriak ezkontzen direnean, eguzkia eta euria egiten du* 'When foxes marry, the sun and rain appear'. Thus, *azeri-ezkontza* is a cognitive artifact that integrates the Animals circle with the social/ceremonial domain, demonstrating how the concentric model allows blending across circles.

##### 4.4.1.1 The cognitive operation: Conceptual blending

The creation of *azeri-ezkontza* involves four main mental spaces:

1. Input space 1: The meteorological event. This space contains the anomalous sensory experience: rain falling while the sun is shining. Its organising frame is that of *weather*, but it carries a contradictory structure, two normally incompatible phenomena (rain and

sunshine) co-occur. This contradiction creates a cognitive dissonance which calls for resolution.

2. Input space 2: The folk-narrative space. This space draws on Basque folklore, in which the fox (*azeria*) is consistently portrayed as a trickster, clever, deceptive and prone to creating mischief. The organising frame is that of *social ritual*, specifically a *wedding (ezkontza)*. In the folk narrative, a fox's wedding is depicted as a joyful yet chaotic event, often associated with laughter, trickery and the unexpected. Crucially, this space already contains a ready-made cultural schema for a situation in which two contradictory elements coexist (festivity and trickery, order and disruption).
3. Generic space. The generic space abstracts what the two inputs share: a structured event involving agents (the fox / the sun and rain), a moment of transition or unusual conjunction and a degree of unexpectedness. This common structure allows the two inputs to be mapped onto each other.
4. The blend. The blend selectively projects elements from both inputs to create a new, emergent mental space. From Input 1, it takes the co-occurrence of sun and rain as a single *event*. From Input 2, it takes the *trickster agent* (the fox) and the *ritual framework* (the wedding). In the blend, the contradictory weather event is *framed as a wedding performed by the fox*. This framing does not merely juxtapose the two inputs; it generates emergent structure:
  - The sun and rain are no longer opposed forces but participants in a trickster's celebration.
  - The deceptiveness of the weather is explained by the fox's intentional agency.
  - The term *ezkontza* 'wedding' adds a layer of social meaning, transforming a mere atmospheric anomaly into a culturally intelligible event.

The blend is then compressed into the linguistic form *azeri-ezkontza*, which functions as a cognitive anchor: It stores the entire blended mental space in a single, easily retrievable expression.

#### 4.4.1.2 *Why the blend is cognitively necessary*

From the perspective of embodied cognition, the term originates in a bodily experience of sensory contradiction. The human cognitive system seeks coherence; when faced with an incongruity (rain and sunshine together), it recruits available conceptual resources to reduce dissonance. The folk-narrative space provides a ready-made schema which already encodes

seemingly contradictory elements united through trickery. By blending the weather event with this schema, the speaker achieves a coherent, memorable representation.

Cultural cognition supplies the specific content of Input space 2. The fox as trickster is not a universal constant; it is a culturally shaped image (Palmer 1996) deeply embedded in Basque oral tradition. The choice of *wedding* rather than, say, a fight or a game, is also culturally significant—weddings in Basque culture are communal celebrations marked by both joy and structured transgression, a perfect analogue for the simultaneous presence of sun (joy, clarity) and rain (disruption, life). Thus, the blend is not cognitively arbitrary but culturally motivated.

Usage-based dynamics account for the expression's entrenchment. Once the blend stabilises, its cognitive economy ensures transmission: A single two-word compound encapsulates a complex inference, making it easy to learn and recall. The existence of proverbs such as *Azeriak ezkontzen direnean, eguzkia eta euria egiten du* 'When foxes marry, the sun and rain appear' shows how the blend has been reinforced through repeated use across generations, solidifying it as a conventional unit in the weather lexicon.

Finally, from the perspective of the concentric architecture, *azeri-ezkontza* originates in the 'Animals' circle (the local fauna) and blends it with the 'Social/Ceremonial' circle (*ezkontza*). This demonstrates how the concentric model operates: The lexicon does not simply borrow from discrete domains but actively *integrates* them through complex cognitive operations, creating novel meanings that are both ecologically grounded and culturally resonant. The term thus functions as a cognitive artifact, a material trace of the mental process by which the Basque speech community has transformed a moment of sensory puzzlement into a structured, shared understanding of their world.

#### **4.5. The fifth circle: Mythology**

This circle preserves lexical relics of the pre-Christian, matriarchal-naturalist Basque worldview. Table 5 lists terms derived from the root *ost-* (linked to the sky/storm god *Ortzi* or *Osti*): *ostadar* 'rainbow', 'sky horn'; *ostots* 'thunder', 'sky noise'; *ortzikara* 'storm', 'sky shaking'; alongside *sorgin-haize* 'sorcerer wind' and *iratxo haize* 'leprechaun wind' for whirlwinds, the goddess *Mari* (associated with hailstorms and thunderclouds), and the malevolent storm genius *Eate*. These metaphors translate overwhelming cosmic forces—the auditory power of thunder, the visual drama of lightning, the erratic movement of whirlwinds—into comprehensible narratives, offering linguistic fossils of an animistic cosmology. Culturally, they reflect a systematic

mythological framework, with the root *ost-* showing remarkable productivity in weather compounds (Caro Baroja 1984). Usage varies: Some terms remain active in everyday speech, while others survive mainly in folkloric or poetic contexts. The coexistence of mythological *ostadar* with religious terms for the rainbow (*Erromako zubi*, *Jaungoikoaren gerriko*) illustrates historical layering without replacement. As the outermost layer of indigenous worldview, the mythology circle marks the point where immediate sensory experience gives way to systematic metaphysical interpretation.

**Table 5**

The fifth circle: Mythology – Foundational metaphors in the Basque weather lexicon

<b>Term (Basque)</b>	<b>Meteorological term</b>	<b>Embodied grounding</b>	<b>Cultural salience</b>	<b>Usage patterns</b>	<b>Concentric architecture</b>
<i>Ortzi/Osti</i>	Sky/Storm God	Cosmic scale, atmospheric power	Pre-Indo-European cosmology, celestial deity	Productive root in compounds	Archaic worldview foundation
<i>ostadar</i>	Rainbow	Visual arch shape, curvature	Mythological framing, celestial symbolism	Conventionalised term	Natural phenomena as divine signs
<i>ostarku</i>	Rainbow	Structural perception, arch form	Architectural metaphor for celestial bridge	Poetic/descriptive usage	Cosmic architecture
<i>ostots</i>	Thunder	Auditory intensity, vibration experience	Divine manifestation, sky god's voice	Ancient, deeply entrenched	Personified nature forces
<i>ortzikara</i>	Storm	Kinetic sensation, ground vibration	Cosmic disturbance, celestial anger	Dramatic description	Animated cosmology
<i>sorgin-haize</i>	Whirlwind	Erratic movement perception	Supernatural beings, witchcraft beliefs	Folk belief expression	Supernatural agency

<i>iratxo haize</i>	Whirlwind	Spiral visual patterns	Mythological creatures, folk narratives	Regional folk usage	Animated nature spirits
<i>Mari</i>	Hailstorms, thunderclouds	Atmospheric violence perception	Principal goddess, matriarchal tradition	Mythological references	Divine personification
<i>Eate</i>	Thunderstorms, lightning	Destructive power experience	Malevolent spirit, storm embodiment	Specialised mythological term	Demonic meteorological forces

Examples in context. Basque-English (Dieguez 2021)		
<i>Ortzi/Osti</i>	Conceptual root	no sentence
<i>ostadar</i>	<i>Ostadarra ikusi genuenean, konturatu ginen ekaitza igaro zela</i>	‘When we saw the <i>sky horn</i> , we realised the storm had passed’
<i>ostarku</i>	<i>Ostarkua mendi bi artean zubi moduan</i>	‘The <i>sky arch</i> like a bridge between two mountains’
<i>ostots</i>	<i>Ostotsak etxe osoa ikararazi du</i>	‘The <i>sky noise</i> shook the whole house’
<i>ortzikara</i>	<i>Ortzikara hurrerutzen da mendi artetik</i>	‘A <i>sky-shaking</i> is coming from the mountains’
<i>sorgin-haize</i>	<i>Sorgin-haizeak orbelak eraman ditu auzora</i>	‘The <i>sorcerer wind</i> carried the dry grass to the neighbourhood’
<i>iratxo-haize</i>	<i>Iratxo haizeak txapela bota zidan</i>	‘The <i>leprechaun wind</i> took my beret off’
<i>Mari</i>	<i>Mari haserretu egin da gaur: txingorrek mahatsa hondatu du</i>	‘It was <i>Mari</i> ’s anger today: The hailstones ruined the grapes’
<i>Eate</i>	<i>Haraneko eta mendiko ekaitz-hodeiak zuzentzen dituen jeinua</i>	‘Spirit that directs the storm clouds from valley to valley and from mountain to mountain’

#### 4.5.1. Case study: Coexistence of rainbow terms

The coexistence of three distinct terms for the rainbow —the mythological *ostadar* (‘sky horn’), the religious *Erromako zubi* (‘Bridge to Rome’) and *Jaungoikoaren gerriko* (‘God’s belt’)— within the Basque weather lexicon offers a striking illustration of how multiple cultural frameworks can simultaneously inform the understanding of a single natural phenomenon. From the perspective of embodied grounding, the same visual experience (the arch of a rainbow) is interpreted through different cultural filters: The mythological frame sees a celestial horn or arch, the Christian frame a bridge connecting Rome (the centre of Christendom) or a divine belt. This multiplicity of interpretations reflects cultural cognition at work: Speakers have access to multiple explanatory

frameworks, each rooted in different historical layers of belief, and they can switch between them depending on context.

The usage-based dynamics of these terms further reveal that context determines term selection. *Ostadar* remains the most common, neutral term in everyday speech, while *Erromako zubi* appears more frequently in literary or religiously marked contexts, and *Jaungoikoaren gerriko* is typically poetic or emphatic. This layering exemplifies the concentric architecture of the lexicon: historical accumulation without complete replacement. The older mythological layer (circle 5) has not been erased by the later religious layer (circle 6); instead, both coexist, each available to speakers for different communicative purposes. Thus, the religious layer does not supersede the mythological but complements it, creating a rich palimpsest of environmental understanding that spans from bodily experience to divine intervention. This case study confirms that the Basque lexicon incorporates new cultural influences while often preserving older conceptual frameworks, a pattern which characterises the concentric model as a whole.

#### **4.6. The sixth circle: Religion**

The outermost circle reflects Christian influence, introducing new metaphorical mappings which coexist with older frameworks. Table 6 provides examples: *Erromako zubi* ‘Bridge to Rome’ and *Jaungoikoaren gerriko* (‘God’s belt’ for the rainbow; *Jainkoaren argi* ‘God’s light’ for lightning, and calendar-bound winds such as *Aste Santu haize* ‘Holy Week wind’ and *Garizuma-haize* ‘Lent wind’, both referring to the east wind. These terms reinterpret universal sensory experiences—a rainbow’s arch, lightning’s sudden illumination, seasonal wind patterns—through theological symbolism. Culturally, they demonstrate syncretism: Christianity overlays indigenous beliefs without erasing them, as seen in the coexistence of three terms for the rainbow (mythological *ostadar*, pilgrimage-based *Erromako zubi* and divine-attribute *Jaungoikoaren gerriko*). Liturgical calendar terms maintain practical relevance for seasonal forecasting while serving as markers of religious identity. Usage patterns are more formal and explicitly religious compared to mythological equivalents, and regional variations (attested in Gipuzkoa, Bizkaia and Navarre) reflect differing intensities of Christianisation across different Basque territories (Dieguez 2021). As the outermost circle, religion represents the most recent major cultural influence, completing the conceptual expansion from individual bodily experience to transcendent cosmological interpretation. It stands as testament to the language’s capacity to incorporate new influences while maintaining continuity with its conceptual heritage.

**Table 6**

The sixth circle: Religion – Foundational metaphors in the Basque weather lexicon

Term (Basque)	Meteorological term	Embodied grounding	Cultural salience	Usage patterns	Concentric architecture
<i>Erromako zubi</i>	Rainbow	Visual structure, arch form	Christian pilgrimage routes, Rome as holy centre	Literary and religious contexts	Christian cosmological mapping
<i>Jaungoikoaren gerriko</i>	Rainbow	Encircling form, celestial band	Divine attribute, biblical symbolism	Poetic and religious expression	Theological metaphor
<i>Jainkoaren argi</i>	Lightning	Visual intensity, sudden illumination	Sacred manifestation, divine power	Conventionalised religious term	Christian symbolism of light
<i>Aste Santu haize</i>	East wind	Seasonal patterns, directional perception	Liturgical calendar, Easter traditions	Temporal religious reference	Ritual time association
<i>Garizuma-haize</i>	East wind	Persistent quality, seasonal timing	Penitential season, religious observance	Liturgical weather lore	Religious calendar integration
<i>San Martin haize</i>	Specific seasonal wind (Nov 11)	Seasonal weather patterns	Saint's feast day (Nov 11)	Folk religious usage	Saint-day meteorology

Example in context. Basque-English (Dieguez 2021)		
<i>Erromako zubi</i>	<i>Goizeon Erromako zubi zoragarria ikusi dugu herrian</i>	'This morning, we saw a wonderful <i>bridge to Rome</i> in the village'
<i>Jaungoikoaren gerriko</i>	<i>Jaungoikoaren gerrikoak iragartzen du euria bukatzeko zorian dela</i>	' <i>God's belt</i> promises that the rain is over'
<i>Jainkoaren argi</i>	<i>Lurraren bazter batetik bertzera jotzen du Jainkoaren argiak</i>	' <i>The light of God</i> reaches from one end of the ground to the other'

<i>Aste Santu haize</i>	<i>Aste Santu haizea dator, hotz egingo du gauean</i>	‘The <i>Holy Week</i> wind is coming; it will be cold tonight’
<i>Garizuma-haize</i>	<i>Garizumako haizeak ez du uzten loratzen</i>	‘The <i>Lent</i> wind won't let the blossoms open’
<i>San Martin haize</i>	<i>San Martin haizearekin, gaztainak erori ohi dira</i>	‘With the <i>St. Martin's</i> wind, chestnuts usually fall’

#### 4.7. Conclusion: The lexicon as cultural craftsmanship

In conclusion, the Basque ethnometeorological lexicon stands as a profound testament to the enduring role of a linguistic community as *arotitzak* ‘weather words’—cultural craftspeople. Through the concentric process of lexical creation, they have continually carved, assembled and architected their environmental reality into a coherent, transmissible and living system. This perspective fundamentally reframes language revitalisation; it is not merely the preservation of archaic words, but the active safeguarding of a community’s innate capacity for collective meaning-making. The ultimate goal is the transmission of the tools, the blueprints and the craft itself to future generations.

The analysis conducted through the lens of the six concentric circles reveals a lexicon which is anything but a haphazard collection of arbitrary labels. Instead, it emerges as a deeply structured, dynamic and motivated cultural-cognitive system, built layer by layer over millennia through the continuous dialogue between embodied experience and collective world-building. This architectural model does more than just organise vocabulary; it provides a cognitive map of the Basque community’s conceptual priorities, meticulously tracing a path from the individual, sensory experience of the body to the shared, abstract narratives of mythology and religion.

The implications of this concentric architecture extend far beyond the specific domain of Basque meteorology, presenting a significant challenge to foundational pillars of modern linguistic theory. It compels a critical re-examination of two of the field’s most enduring debates: the principle of the arbitrariness of the sign and the nature of linguistic relativity.

First, the concentric model compellingly demonstrates that the lexicon is a structured system. It is not a chaotic or arbitrary repository but a highly organised framework which reflects a community’s worldview. This structure’s progression from the body outwards is not merely organisational but reflects a fundamental cognitive path of concept formation: We understand the world by first understanding ourselves and our immediate sphere of action. This progression from

individual embodiment to shared cultural narratives provides a cognitive map of the community's conceptual priorities.

Second, the model reinforces the view that reality and culture shape language, challenging the strong version of the Sapir-Whorf hypothesis—the view that a language's grammatical structures determine a speaker's perception of reality. The data demonstrates that the Basque community's tangible experiences provide the semantic raw material from which the *arotitzak* 'weather words' forge their lexicon. Language does not impose categories on reality; rather, the salient features of their reality motivate and constrain the linguistic categories they construct. Language does not impose these categories on reality; rather, the salient features of their reality provide the motivation for the linguistic categories they create.

Finally, the case study provides compelling evidence for the cognitive processes of metaphor and embodiment. The creation of weather terms is a clear example of how the human mind, or the "culturally-shaped imagery", comprehends the less understood in terms of the well-understood. For instance, the phenomenon of an icicle—a transient and somewhat abstract formation of frozen water—is conceptualised through highly tangible objects from everyday life. By calling it an *izotz-ziztor* 'ice sausage' or an *izotz-burruntzi* 'ice iron wedge', speakers are performing a cognitive mapping. They project the known attributes of a source domain (food, tools) with concrete shapes and functions onto the target domain (a meteorological phenomenon), making it graspable, imaginable and meaningful. This process is not arbitrary; it is a motivated, embodied and culturally-grounded act of meaning-making.

Thus, the Basque weather lexicon is more than a list of words; it is the accumulated craftsmanship of a people, a structured testament to how a community has built its world, one concentric circle at a time.

## **5. The lexicon as evidence for theoretical linguistics**

### **5.1. Iconicity and the concentric architecture**

The concentric analysis in Section 4 revealed a lexicon which is deeply motivated: Weather terms are not arbitrary labels but are systematically built upon embodied experience, cultural practices and historical worldviews. This motivation, however, is not restricted to semantics. It extends to the very sound structure of words. In the Basque weather lexicon, iconicity—the

non-arbitrary resemblance between a word's form and its meaning— operates as a systematic, rule-governed principle which reinforces the concentric logic. The closer a term is to the innermost circles (Body, Food, Tools), the more likely it is to exhibit iconic patterns, particularly onomatopoeia and sound symbolism. This section analyses how the Basque lexicon uses phonological resources to create direct sensory resonances with meteorological phenomena, and shows that this iconic productivity is itself an emergent property of the embodied, cultural and usage-based dynamics articulated in our theoretical framework.

Following Taub (2001), who demonstrated in American Sign Language that iconicity and metaphor are deeply intertwined and that motivated forms arise from embodied experience, we argue that the Basque weather lexicon exhibits a similar convergence of iconic and metaphorical structuring. Taub's "analogic mapping" model —whereby physical form resembles meaning in systematic ways— applies equally to spoken languages when onomatopoeic and sound-symbolic patterns are examined. In Basque, terms such as *asto-karrerak* —'donkey races' for heavy rain— or *karakol-haize* —'snail wind' for whirlwind— do not simply denote; their rhythmic structure and phonesthetic qualities evoke the sounds and movements they describe.

Yet iconicity is not an objective, speaker-independent property. Occhino, Anible, Wilkinson and Morford (2017) have shown that perceived iconicity is modulated by language experience and that more proficient speakers of a language may perceive stronger iconicity even in forms which are not transparent to naive listeners. Applied to the Basque weather lexicon, this finding suggests that the iconic resonances of terms like *izotz-ziztor* 'ice sausage' or *elur-lapats* 'snow curd' may be more readily perceived by speakers with deep exposure to traditional rural and gastronomic contexts. In other words, iconicity is not a fixed property of the sign but emerges dynamically from the interaction between form and the listener's experiential background, a point which aligns perfectly with the usage-based and culturally situated framework adopted in this study.

From a cognitive perspective, Emmorey (2014) has proposed that iconicity operates as structure mapping between domains, analogous to conceptual metaphor. In her account, iconic signs are not simple pictures but structured analogies: The form of the sign maps onto the form of the referent in a way that preserves relations, not only surface features. The Basque weather lexicon provides a compelling case for this view. When a Basque speaker says *elur-mataza* 'snow skein', the word does not merely imitate a snowflake; it maps the tangled, bundled structure of a skein of yarn onto the complex, clustered structure of a large snowflake. Similarly, *izotz-burruntzi* 'ice wedge' maps

the sharp, pointed geometry of a blacksmith's tool onto the icicle. Thus, iconicity in this lexicon is not reducible to simple onomatopoeia; it involves relational resemblance across the concentric circles.

Finally, the specific domain of animal metaphors, analysed in Section 4.4, is particularly instructive. Iza Erviti (2012), in her study of resemblance operations and conceptual complexity in animal metaphors, demonstrates that animal-based figurative language often relies on multiple layers of resemblance (visual, behavioural and cultural) which are integrated into a single expression. Her framework helps explain why Basque animal-based weather terms such as *ahari-buruak* — 'ram heads' for cumulus clouds— or *kuku-izerdi* —'cuckoo sweat' for fine rain— are so cognitively efficient: They compress complex perceptual and cultural information into a compact, iconic form. Iza Erviti's notion of resemblance operations —whereby the speaker selects a salient property of the animal and projects it onto the target— parallels our concentric model, in which each circle selects a different kind of resemblance (bodily, culinary, manual, animal, mythological or religious) to structure meteorological understanding.

#### 5.1.1. *Iconicity as a motivated relation*

For much of twentieth-century linguistics, Ferdinand de Saussure's principle of arbitrariness (Saussure 1916) held that the link between sound and meaning is purely conventional. In this view, a word like *dog* could just as easily be any other sequence of sounds; the connection exists only by social agreement. Yet the Basque weather lexicon offers a strong counter-example. Here, many terms exhibit *iconicity*: A motivated relationship in which the form of a word mimics or evokes the sensory qualities of the phenomenon it denotes (Lamb 1999; Bross 2024). Iconicity is best understood not as a direct imitation of an external sound (though it includes onomatopoeia), but as a mapping between the word's form and a *mental representation* of the experience, a visual pattern, a tactile sensation or an acoustic image (Wilcox 2004; Bross 2024). This perspective aligns perfectly with our four-pillar framework: Iconicity is grounded in embodied cognition (Pillar 1), becomes culturally elaborated through shared perceptual habits (Pillar 2) and is conventionalised through patterns of use (Pillar 3).

#### 5.1.2. *The concentric distribution of iconic terms*

Iconic forms are not evenly distributed across the six circles. They are most frequent and most systematic in the innermost circles, in which reference is made to phenomena directly accessible

to the senses. In the Body circle, terms often rely on tactile or auditory analogies (e.g., *hanka mehe* ‘thin leg’ for fine rain). In the Food circle, words like *elur-lapats* ‘snow curd’ and *izotz-ziztor* ‘ice sausage’ evoke textures and shapes through culturally familiar culinary items. In the Tools & Clothes circle, the sound patterns of terms such as *huri-zirtzil* ‘ragged rain’ or *zapar* ‘downpour’ mirror the percussive or continuous qualities of the weather events. As we move outwards to the Animals circle and beyond, iconicity becomes less direct, often replaced by metaphorical mapping based on behaviour or cultural narratives (e.g., *azeri-ezkontza* ‘fox wedding’ for sunshower). This concentric distribution is no accident: It reflects the embodied principle that the most immediate, sensorimotor experiences are the most likely to be rendered iconically.

### 5.1.3. Systematic iconicity: Reduplication and sound symbolism

The Basque weather lexicon exhibits two well-defined mechanisms for constructing iconic meaning: reduplication and motivated phonetic selection.

#### 5.1.3.1 Reduplication for repetition and continuity.

Many weather events are characterised by repetition, continuous rain, successive hailstones, recurring gusts of wind. Reduplicated forms capture this temporal structure iconically by mimicking repetition through repetition.

- *Barra-barra* ‘heavy, continuous rain’: The reduplication mirrors the unbroken fall.
- *Kiski-kaska, zirt-zart* ‘hail or sleet’: The alternating syllables replicate the staccato rhythm of ice pellets striking surfaces.
- *Mara-mara* ‘heavy snowfall’: The soft reduplication evokes the silent, dense accumulation of snow.

These forms are not mere lexical curiosities; they are productive patterns that speakers use to create new expressions, illustrating the usage-based dynamics (Pillar 3) which entrench such iconic structures.

#### 5.1.3.2 Phonetic motivation: The symbolic value of sounds.

Beyond structural repetition, the specific sounds themselves are selected for their sensory affordances. The Basque inventory is exploited systematically to evoke qualities such as fineness, intensity or abruptness.

**Table 7**  
Iconicity and onomatopoeia

Phenomenon	Onomatopoeic terms	The evoked sensation
Thunder	<i>dart</i> (the explosive sound)	The explosive sound
Hail / sleet	<i>kiski-kaska, zirt-zart</i> (the sound of impact)	The sound of impact
Rain	<i>barra-barra</i> (heavy rain), <i>zarra-zarra, zir-zir, zapar</i>	The sound of heavy rain
Wind	<i>pil-pil, firin-faran</i> (the sound of movement)	The sound of movement
Lightning	<i>zik-zak</i> (the visual pattern)	The visual pattern
Heavy snow	<i>mara-mara</i> (silent intensity)	The soft, continuous visual of a heavy fall

This phonetic motivation aligns with the embodied grounding (Pillar 1): The acoustic properties of the speech sounds mirror the perceptual properties of the weather event, creating a direct sensory bridge between word and experience.

#### 5.1.4. *Iconicity as cultural craftsmanship*

The iconic patterns documented here are not a superficial stylistic layer but a central feature of the Basque weather lexicon’s architecture. They exemplify the *arotitzak* ‘weather words’ —the craftsmanship of the speech community— at the level of sound itself. Speakers have shaped the raw material of the phonological system into a repertoire of forms which perform the weather as much as they describe it. In this sense, iconicity is a direct outcome of the same cultural-cognitive processes which gave rise to the concentric circles: Embodied experience (Pillar 1) provides the sensory templates; cultural cognition (Pillar 2), particularly the habitus of close environmental attunement, makes certain sound-meaning mappings salient; and usage-based dynamics (Pillar 3) conventionalise and transmit these iconic forms across generations.

#### 5.1.5. *Conclusion: From arbitrariness to motivation*

The systematic iconicity of the Basque weather lexicon does not refute the existence of arbitrariness —many words remain conventional— but it decisively challenges the view of arbitrariness as a universal, dominant principle. Instead, the data support a continuum of motivation, ranging from purely conventional to highly iconic. The concentric model helps explain this distribution: Iconicity flourishes in the innermost circles, within which embodied experience is most immediate, and becomes more attenuated as we move towards abstract mythological and

religious interpretations. By grounding iconicity in the same theoretical pillars that structure the lexicon as a whole, we see that sound symbolism is not an anomaly but an integral part of how the Basque speech community has built its meteorological vocabulary, one concentric layer at a time.

## 5.2. Linguistic relativity and lexical granularity

The Basque lexicon provides a compelling case study for the linguistic relativity hypothesis. The lexicon's conceptual granularity—the degree of fine-grained distinctions it makes within a semantic domain—offers a quantifiable metric for testing whether language influences thought. The lexical elaboration ratio for types of rain serves as a powerful heuristic for this conceptual granularity.

Basque reportedly distinguishes at least 12+ types of rain, compared to the approximately 5 types found in the contact language, Spanish (Dieguez 2021).

This lexical elaboration is not arbitrary but correlates directly with the cultural and practical significance of weather in agropastoral communities, in which distinguishing a persistent, soaking *euri-zirtzil* 'drizzle' from a sudden, intense *zaparrada* 'downpour' has direct implications for work, livestock and crops. This demonstrates the integrated nature of our theoretical framework: The culturally-shaped habitus (Pillar 2) cultivates a perceptual need for such fine-grained distinctions, which are then conventionalised and entrenched through repeated use (Pillar 3).

The cognitive implications of this lexical asymmetry are significant. Following Dan Slobin's 'thinking for speaking' framework (Slobin 1996), the need to make these distinctions in language cultivates a heightened perceptual readiness to notice them in the environment. Research suggests that having discrete lexical categories can enhance the categorical perception and memory of phenomena. Therefore, Basque speakers may be habituated to perceive, remember and reason about rain in a more fine-grained manner than speakers of languages with a less elaborated lexicon. This is not a deterministic claim, but rather strong evidence for linguistic influence on habitual thought patterns and environmental attunement.

These findings reaffirm the value of specialised lexicons as windows into the intricate relationship between language, culture and the cognitive construction of reality.

## **6. Conclusion: Language as a living archive and a tool for world-building**

This article has systematically demonstrated that the Basque ethnometeorological lexicon is far more than a simple inventory of labels for atmospheric phenomena. It is a dynamic, motivated and highly structured cognitive system, a testament to a unique form of human engagement with the natural world. By applying an integrated four-pillar analytical framework, we have traced the genesis of this complex vocabulary to the powerful confluence of universal embodied experience, collectively shared cultural knowledge and historically entrenched patterns of communication. The verdict is unequivocal: This lexicon functions as a living archive, a cognitive library which encapsulates millennia of careful observation and the intergenerational transmission of adaptive ecological knowledge. Crucially, this archive is not a static relic. It is actively maintained and dynamically contested, as seen in the historical layering of mythological and religious terms, and it now faces its most profound challenge as anthropogenic climate change alters the very environmental realities it evolved to so precisely describe.

### **6.1. Synthesis of findings: A coherent system of meaning**

Our analysis robustly confirms the central thesis that the Basque weather lexicon is a coherent system governed by the principles of the “Concentric Theory of Lexical Creation”. We have shown that each term is a multi-dimensional entity: It is simultaneously a cognitive structure grounded in universal sensorimotor perception (Pillar 1), a cultural artifact forged by the specific demands of agropastoral life and shifting historical worldviews (Pillar 2) and a usage pattern stabilised by cognitive processes of chunking and entrenchment within the speech community (Pillar 3). The overarching concentric architecture (Pillar 4) provides the organising logic, mapping a clear cognitive path from the most immediate, bodily experiences to the most abstract, cultural narratives.

The lexicon’s profound iconicity and exceptional conceptual granularity deliver a decisive verdict against the universality of the Saussurean dogma of arbitrariness (Saussure 1916). The relationship between a Basque weather term and its meaning is demonstrably motivated, often traceable to a tangible source in the community’s lifeworld. Furthermore, the systematic nature of these motivations provides compelling support for a sophisticated interpretation of the linguistic relativity hypothesis. Language is revealed here not as a passive mirror reflecting a pre-existing reality, but as an active and primary tool for its construction and conceptualisation. Our four-pillar framework has proven essential in capturing this complexity, demonstrating that the lexicon is an

emergent property of the continuous interaction between the body, the community and its communicative practices.

## **6.2. Implications for language preservation: From vocabulary to worldview**

The findings of this research carry profound and practical implications for the fields of language preservation and revitalisation. It compellingly frames minority languages like Basque not as mere alternative codes for expressing universal ideas, but as invaluable repositories of unique conceptual systems and Traditional Ecological Knowledge (TEK). The potential loss of such a language, therefore, represents an irreversible erosion of human cognitive and cultural diversity, akin to the deletion of a unique database of environmental understanding.

Our framework suggests that effective revitalisation strategies must move decisively beyond the simplistic goal of vocabulary acquisition. To learn the word *ziztor* ‘sausage’ for an icicle is one thing; to understand the cultural-cognitive act of perceiving an icicle *as* a sausage is another, far deeper level of acquisition. True revitalisation must therefore involve the transmission of the cultural practices, the environmental engagement and the perceptual habits (the *habitus*) which breathe life and meaning into the lexicon. This means designing pedagogical and community-based initiatives which reconnect speakers with the land, the crafts and the stories that originally motivated these terms. By understanding a lexicon as an integral part of a way of life, preservation efforts can become more holistic, culturally resonant and, ultimately, more sustainable and successful.

## **6.3. Final reflection: The lexicon as a human testament**

The study of the Basque weather lexicon ultimately reaffirms the role of language as humanity’s most sophisticated and enduring technology for organising experience, coordinating collective perception and transmitting hard-won knowledge across the generations. Such specialised lexicons are a powerful testament to the human capacity to create intricate, ecologically-attuned and aesthetically rich systems of meaning. They stand as a powerful reminder that the world’s languages are not simply different sets of labels for a single, uniform reality. Rather, they are different tools for building and inhabiting distinct realities. Each language, with its unique architectural principles like the concentric model, offers a particular window into the human relationship with existence. In preserving them, we do not merely save words; we safeguard

irreplaceable chapters in the collective story of humanity, ensuring that a wider array of these tools for world-building remains available for future generations.

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