

Frames and semantic roles in metaphorical mappings

A contrastive study of English *boil* and Spanish *hervir*

Ignasi Navarro i Ferrando and Montserrat Esbrí-Blasco
Universitat Jaume I | Institut Interuniversitari de Llengües Modernes
Aplicades

Conceptual Metaphor Theory describes metaphorical mappings as correspondences between domains. Nevertheless, the interrelations of the mapped elements still need to be characterised. This study analyses metaphorical mappings from one situational frame in the COOKING domain in American English and Peninsular Spanish. The aims are to elucidate to what extent each language primes particular semantic roles in the BOILING frame for metaphorisation and explore the possible cultural implications of these cross-linguistic differences. The qualitative analysis reveals the contrastive relevance of semantic roles in frame mappings. In addition, the frequencies of *boil* and *hervir* metaphorical senses determine the degree of entrenchment and salience of metaphors cross-linguistically. The results suggest that the English BOILING frame has a considerably broader scope as a source than the Spanish HERVIR frame. Additionally, the paper contrasts the relative saliency of the semantic roles mapped in those metaphors shared by both languages. Finally, cultural implications are discussed.

Keywords: conceptual metaphor, frames, semantic roles, contrastive semantics, metaphor variation

1. Introduction

It is widely assumed that metaphor is a necessary cognitive strategy for conceptualisation and communication (Goatly, 1997, p. 2). It is also accepted that diverse cultures may share metaphors because these emerge from embodied aspects of experience common to human societies (Yu, 2008). At this point, the issue of variability arises, i.e. to what extent shared metaphors are used similarly or differently

in separate cultures (Barcelona, 2001; Kövecses, 2005, 2008; Musolff, 2015), or even which idiosyncratic metaphors build divergencies in the way distinct societies conceptualise their experience (Ibarretxe-Antuñano, 2013). Multiple variability factors have been observed and described, such as the degree of linguistic elaboration, the kinds of linguistic expression used, the degree of conventionalisation, and the degree of specificity and scope (Kövecses, 2005; Schmidt & Brdar, 2012). Further issues arise as cross-linguistic contrastive analysis is addressed, like the translation equivalence of the linguistic expression used (Fernández-Silva et al., 2012; Stepins, 2022), frame variation (Sullivan, 2013), image-schematic and force-dynamic embodiment (Yu, 2023) or the semantic roles highlighted in the mapping (Esbrí-Blasco & Navarro i Ferrando, 2023). Such cross-linguistic divergences become relevant when teaching and learning a foreign language at advanced levels, particularly figurative language use. Metaphor has recently raised a renewed interest in the language learning arena (for an overview, see Hoang, 2014). Moreover, raising metaphor awareness as a pedagogical strategy to prompt vocabulary acquisition in a foreign language has become a central topic (Boers, 2000, 2003; Kalyuga & Kalyuga, 2008; Niemeier, 2017). Since metaphor constitutes a cross-cultural tool for vocabulary teaching, the cross-linguistic equivalence of metaphorical expressions is a hot issue, given the risk of false-friend metaphor learning. False-friend metaphors may lead to mistranslation and other defective communication practices (Boers & Lindstromberg, 2008; Celik, 2021; Fang, 2014; Gutiérrez-Pérez, 2016). In this context, metaphoric competence (Littlemore & Low, 2006) becomes central to understanding speakers' production and interpretation of metaphorical language in a non-native language. Considering these issues, we aim to analyse a case of cross-linguistic metaphor variation departing from the analysis of a source domain (henceforth, SD) conceptualisation to elucidate variation in its mappings onto target conceptualisations in English and Spanish. Thus, if English native speakers incorporate metaphorical uses of the verb *boil* in their speech, and so do Spanish native speakers using the verb *hervir* ('boil'), the question arises whether these two lexical items share a comparable semantic scope in terms of metaphorical extensions in either language. Is identifying an SD and a target domain (henceforth, TD) in both languages enough to affirm that particular metaphorical uses share their mappings in English and Spanish? Are these mappings equally entrenched and have the same degree of salience (Giora, 2003) cross-linguistically?

In Conceptual Metaphor Theory (henceforth, CMT), metaphors are conceptual mappings between domains of experience (Lakoff & Johnson, 1980, 2003). Accordingly, CMT proposes looking into inference patterns and entailments within the TD and the SD and assessing their compatibility. Sullivan (2013) introduced the frame parameter to analyse mappings, including core and peripheral elements and syntactic variability patterns favouring diverse frame elements

(henceforth, FEs) (see also Lederer, 2019). Further evidence suggests that particular FEs might be more salient than others in the mapping (Esbrí-Blasco, 2020; Esbrí-Blasco & Navarro i Ferrando, 2023). Moreover, for an accurate analysis of metaphorical mappings, the concepts in a frame could be characterised beyond the core-versus-peripheral distinction by analysing their semantic roles. Our mapping analysis includes a characterisation of semantic roles to elucidate how American English and Peninsular Spanish¹ share particular metaphors. Commonplace lexical items in both languages, namely English *boil* and Spanish *hervir*, are selected from the COOKING domain to show the analytical procedure and assess cross-linguistic variation in metaphorical usage, particularly between these languages.

As a result of its cultural relevance, COOKING is a powerful potential cognitive domain for metaphorically construing certain abstract domains (Deignan, 2003). Kövecses (2010) emphasises the significance of the COOKING domain, a deeply entrenched domain of experience, as one of the most common SDs utilised for metaphorical conceptualisation.

In the context of cross-linguistic metaphor variation within the COOKING domain, existing studies predominantly focus on food rather than cooking actions. When doing so, they neglect a thorough exploration of the specific conceptual projections between the Source Frame and the Target Frame (henceforth, SF and TF) underpinning culinary metaphorical expressions—see, for instance, Khajeh & Ho-Abdullah (2012), Tsaknaki (2016) and Zhai (2023). The present study builds upon Esbrí-Blasco & Navarro i Ferrando's (2023) methodological advancements and insights to address this gap. Thus, we explore the metaphorical extensions of a pair of culinary verbs, *boil* and *hervir*. Our investigation adds to the existing literature by examining the metaphorical senses associated with these verbs, identifying TFs, FEs, and their thematic roles. This approach emphasises the importance of distinguishing diverse culinary actions and seeks to refine the understanding of the specific metaphorical extensions that these verbs activate.

Regarding the selected terms, *boil* and *hervir*, Dictionaries' (Oxford, Webster's, Cambridge, RAE)² primary entries show broad general definitions of these lexical units with no particular domain association. However, corpus evidence from COCA (English) and CEWD (Spanish) shows that collocation frequencies favour the COOKING domain as predominant in the general literal usage of these verbs (see Figures 1 and 2). In addition, the primary English dictionaries include

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1. Henceforth, “English” refers to American English and “Spanish” to Peninsular Spanish.
 2. Only one dictionary is used for Spanish since this one is considered normative by the linguistic community, whereas several dictionaries are customarily used in metaphor research for English.

senses explicitly related to the COOKING domain (Cambridge Dictionary Online, sense B1, as a tr and intr verb; Oxford Advanced Learner's Dictionary, senses 2 and 3, as a tr and intr verb), whereas no other particular domains of the conceptual system are relevant for the definition of further specific literal senses (i.e., non-figurative or non-metaphorical) in these dictionaries. Because of both dictionary domain specification and corpus evidence, we assume that *boil* and *hervir* map the COOKING SD onto their general language figurative senses. These items evoke a concrete situational frame – rather than the entire domain – as illustrated in Section 5.

We aim to provide a fine-grained contrastive analysis of the metaphorical conceptualisation scope of BOILING and HERVIR as SFs within the COOKING domain, focusing on their frequency in each language and the semantic roles mapped.

2. Cross-linguistic metaphor variation

This paper focuses on the cross-cultural dimension of metaphor variability (Ibarretxe-Antuñano, 2005; Stepins, 2022). As Kövecses (2005, 2006, 2015) points out, all cultures share many aspects of experience, particularly those related to the body, emotions and the human sensory-motor apparatus. Therefore, those metaphors grounded in direct experience are good candidates to occur in many languages. Kövecses (2008, p. 55) suggests that a metaphor may be shared across cultures by mere chance, borrowing or caused by a universal motivation grounded on experience. Yu (2008, p. 259) argues that more general metaphors tend to be universal, whereas specific-level metaphors vary across cultures. In this line, variation has been described in metaphors grounded in sensory-motor experience (Sharifian, 2011). Kövecses speaks of “congruent metaphor” when a generic-level metaphor shared by many cultures has specific-level versions still participating in the generic schema, e.g., AN ANGRY PERSON IS A PRESSURISED CONTAINER (Taylor & Mbenese, 1998; Yu, 2008). Further variation develops when a TD is metaphorically conceptualised through diverse SDs. Conversely, a single SD may provide a conceptualisation schema for various TDs in diverse cultural communities. Additionally, various communities may share a particular set of metaphors. Still, each community uses these metaphors according to divergent preferences, so a metaphor may be predominant and frequent in one culture but marginal in another. Diversity in cultural contexts influences experiential divergences, causing these types of variation (see, e.g., Musolff, 2015). Deignan (2003, p. 260) suggests that the relative salience of particular cultural entities affects their use as vehicle concepts for metaphor (see also Boers & Demecheleer, 1997; Deignan, Lima & López-Mora, 1998). Furthermore, Yu (2008, p. 253) and

Ibarretxe-Antuñano (2013, p. 324) have shown that universal and bodily grounded kinds of experience may be filtered through culture-specific practices.

A comprehensive metaphor theory should explain what makes certain metaphors vary across cultures (Kövecses, 2015). According to Kövecses (2020), two significant causes may lead to variation in metaphor conceptualisation: differential experience and differential cognitive preferences or styles. Differential experience refers to divergence in the surrounding environment due to distinct cultural contexts, which brings about divergent social concerns, interests, and historical memory. Likewise, differential cognitive preferences or styles entail that each language community may highlight various aspects of the same sensorimotor experience, resulting in idiosyncratic cognitive conventions and preferences (Kövecses, 2020, pp. 95–96).

How can metaphor variation be examined in terms of conceptual structure constituents? Kövecses proposes the ‘multi-level view’ of metaphor to explain how the conceptual system is arranged and engaged in metaphorical conceptualisation. In Kövecses’ view, “conceptual metaphors occur at four levels of schematicity in an interlocking vertical hierarchy of image schemas, domains, frames and mental spaces” (2020, p. 90).

The frame analysed here is grounded on experience in both American and Spanish cultures quite similarly, though, at the same time, it expresses a specific level of experience. Therefore, these cultures are expected to use metaphors grounded on that frame, even though a certain degree of variation may also be expected. In addition, Esbrí-Blasco & Navarro i Ferrando (2023) suggest that identifying thematic roles may help elucidate salient aspects of metaphorical mappings. The mappings show a configuration of thematic roles, giving rise to creativity and allowing for contrastive analysis of similar metaphors across languages. Thus, a metaphor assumed to occur in two languages may display differences in the thematic roles mapped onto each language’s TF.

Since this study focuses on the level of frames, the following section briefly discusses the distinction between frames and domains as conceptual configurations.

3. Frames, domains and metaphorical mappings

The theoretical distinction between ‘frame’ and ‘domain’ is controversial. As knowledge structures, frames represent complex objects or stereotyped situations. Fillmore’s (1982, p. 111) frame, as a tool for semantic analysis, is defined as “any system of concepts related in such a way that to understand any of them you have to understand the whole structure in which it fits; when one of the things in such a

structure is introduced into a text or a conversation, all of the others are automatically made available". So, frames are knowledge configurations in long-term memory, depicting the schematisation of recurrent types of daily situations (Fillmore & Baker, 2009). In these configurations, concepts play the roles of participants and props (Ruppenhofer et al., 2010, p. 5) called FEs. Thus, FEs are generalisations over many potential events, situations and individuals, so that frame structure is a cognitive and linguistic schematisation of information about them. The entire frame is part of the meaning of the words expressing FEs. FEs correspond to roles contributing to these meanings. A frame evokes all its FEs, although they are not always expressed explicitly in text or conversation. Accordingly, a metaphoric SF provides the whole knowledge configuration for mapping. FEs may be more central or peripheral and can be characterised as participants or props. Each participant concept has a semantic role in the frame. The meaning of a lexical unit (word sense) cannot be understood –or known at all– without comprehending the whole semantic frame. Thus, analysing and characterising participant concepts of the *BOILING* and *HERVIR* SFs in terms of their semantic roles will enrich the characterisation of the mappings.

Langacker (2002, p.61) suggests that "any cognitive structure –a novel conceptualisation, an established concept, a perceptual experience, or an entire knowledge system– can function as the domain for a predication". Langacker's definition, while comprehensive, lacks precision.

Sullivan (2013, p.22) contributes to refining the concept of domain by introducing 'metaphoric input domains' as "the cognitive structure comprising all schematic information potentially available for mapping via a given metaphor". According to Sullivan, metaphoric input domains encompass only the structure that can be metaphorically mapped, considering that this information includes frame structure.

Additionally, the difference between frames and domains is a matter of conceptual schematicity. In Kövecses' 'multi-level' view of conceptual metaphor, frames and domains are long-term memory conceptual structures contributing to the human conceptual system. Both knowledge configurations participate in metaphor conceptualisation but at different levels of schematicity, frames being less schematic than domains (Kövecses, 2020, p.54). Kövecses (2022, pp.28–29) posits that frames encapsulate information conceptually more specific than cognitive domains and are also more sensitive to the impact of the cultural context in which they operate. Consequently, frames offer a more precise means of identifying the specific aspects of a domain involved in metaphorical projections.

Similarly, Esbrí-Blasco (2020, p.36) envisions a frame as "a culturally dependent conceptual knowledge configuration/cognitive construct that represents a particular prototypical situation based on human experience consisting of inter-

related frame elements (FEs). This particular prototypical situation is, in turn, located conceptually within a broader knowledge construct called domain". Esbrí-Blasco et al. (2019, p.134) also explore this interrelation between frames and domains, referring to domains as:

conceptual constructs or configurations that comprise (all) the concepts related to a particular area of human experience or human knowledge. That area may vary in its complexity but cognitive domains include the different conceptualization of prototypical frames that humans share about that domain of experience. Thus, cognitive domains are not equated to frames, but they consist of frames and their frame constituents (FEs), as well as frame sequences. (i.e., scripts)

This research adopts an SF-oriented approach, focusing on exploring the 'scope of the source' (Kövecses, 2015), i.e., it analyses *BOILING* and *HERVIR* as situational SFs within the *COOKING* domain and aims at showing which TFs are conceptualised through the direct experience of each SF. By analysing metaphorical mappings at the frame level instead of the more schematic domain level, we can identify the particular FEs involved in metaphorical conceptualisation in each language. An onomasiological analysis of the TFs evoked would allow for listing lexical items that evoke diverse SFs like *ROASTING*, *FRYING*, *BOILING* and others in English, and *ASAR*, *FREÍR*, *HERVIR*, and others in Spanish. However, our analysis here is only semasiological, focusing on metaphorical extensions of the lexical units *boil* and *hervir* used as vehicles for metaphors where the SF evoked in each context corresponds to a particular situation event within the *COOKING* domain.

4. Method

A situational SF –*BOILING*– is selected from the *COOKING* SD to determine which TFs it might map onto. The English verb *boil* and its Spanish counterpart *hervir* are the lexical units selected for analysis from the *COOKING* cognitive domain. As a point of departure, we consider these verbs as translation equivalents since their literal sense in several dictionaries coincide in both languages. Though certain lexical items within the *COOKING* domain, like *stew* (Sp. *guisar*), may seem similar to *boil*, the analysis of frequent collocations of these two verbs in the corpora (COCA, CEWD) shows that the same thematic role may be performed by differing entities. In addition, the most frequent collocations in the literal uses in the corpora served us to build the shared SF evoked by the verbs *boil* and *hervir*. Therefore, the SF may be constructed according to contextual evidence (see Section 5.1). The extraction of metaphorical expressions from actual discourse allows for achieving higher representativeness in a given language (Deignan,

2005, 2008, 2015; Deignan & Semino, 2010; McEnery & Hardie, 2012; Newman, 2011; Semino, 2017; Sinclair, 1991; Stefanowitsch & Gries, 2006). In this regard, Biber (2012) holds that following a corpus-linguistic approach provides a higher degree of generalisability and validity to the findings.

Thus, we examine the scope of the BOILING/HERVIR frame as an SF for metaphor in English and Spanish ('scope of the source'), adopting a 'source domain-oriented approach' (Stefanowitsch, 2006).

A sample of 3,000 random citations of *boil* was searched in COCA (Davies, 2008–) and 3,000 of *hervir* in CEWD (Davies, 2016–) to determine which ones were used metaphorically. Those random citations included all the word forms of *boil* and *hervir*, displayed by searching [boil] and [hervir] between square brackets. Although CEWD contains data from 21 Spanish-speaking countries, the search for our study was restricted to European Spanish data. For metaphor identification and mapping description, we adapted MIP (Pragglejaz Group, 2007) by integrating frames (Fillmore, 1982; Sullivan, 2013) as a semantic tool for determining metaphoricality and examining the FEs involved in the conceptual projections.

MIP (Pragglejaz, 2007) is a method for identifying metaphor at the linguistic level, determining whether a given lexical unit is used metaphorically. This method comprises four steps. Firstly, the entire text is read to establish a general understanding of its meaning. Secondly, the text is divided into lexical units. In step (3(a)), the contextual meaning of each lexical unit is described. In step (3(b)), the primary dictionary meaning (called 'basic' in MIP) is determined for each lexical unit. Additionally, in (3c), if the contextual and the basic meaning are not the same, it must be decided whether the contextual meaning contrasts with the basic meaning but can be understood in comparison with it. Finally (step 4), if the contextual meaning can be understood in terms of the basic one, the lexical unit is tagged as metaphorical.

Regarding our adaptation of MIP, the literal meaning of *boil* and *hervir* was determined by looking it up in the *Cambridge Dictionary Online*, *Merriam Webster's Online Dictionary*, *MacMillan Dictionary* and *Diccionario de la Real Academia de la Lengua Española*. Then, after a general understanding of the corpora citations, the contextual meaning of *boil/hervir* was considered for each citation. At that point, if the frame activated by *boil/hervir* in a given corpus example was not the BOILING-HERVIR frame in their literal dictionary definition but another frame whose FEs bear some similarity or correlation with the dictionary literal FEs, then the occurrence was tagged as metaphorical. Therefore, we decided on metaphoricality by comparing the literal meaning frame of the primary dictionary sense explicitly related to the COOKING domain with the contextual frames these lexical units activated in the corpora. Thus, our procedure refines MIP (which identifies linguistic metaphors without describing conceptual mappings) by pro-

viding a detailed description of the FE mappings motivating the metaphorical expressions extracted from the corpora.

Thus, a qualitative analysis of the metaphors is carried out, including a description of the following:

- The Core FEs of *BOIL/HERVIR* as an SF.
- All the TFs evoked by *boil* and *hervir* in their metaphorical occurrences.
- The specific conceptual mappings between core FEs from the *BOIL/HERVIR* SF onto the identified TFs.
- Examples illustrating the conceptual mappings in both languages.
- The relative frequency of metaphorical usage of SF expressions to conceptualise each TF.

Additionally, the contrastive analysis reveals that (Barcelona, 2001):

1. A particular conceptual metaphor exists in both languages if approximately the same conceptual SF and TF can be associated in the two languages.
2. Metaphors existing in both languages may contrast in terms of their conceptual elaboration (mappings) and linguistic exploitation (linguistic realisation by different expressions).
3. Differences in frequency of use are apparent between languages.

We add semantic role analysis for the contrast of source-target correspondences. As a knowledge configuration, a frame needs roles assigned to each participant. We assign schematic semantic roles following Fillmore (1982), Taylor (2002) and Van Valin (2005), so that [THEME] stands for the undergoer entity of *boil/hervir* in the intransitive construction and [PATIENT] stands for the affected entity in the transitive construction.

Identifying thematic roles facilitates understanding the relationships between the participant entities. The SF in this research includes [AGENT], [THEME], [PATIENT], [INSTRUMENT], [LOCATIVE], [MEANS] and [RESULT] in both languages analysed (see Figure 3). Each particular metaphorical expression in either language will use several of these roles in the mappings, revealing fine-grained contrasts across languages. Each metaphorical expression instantiates only some of the thematic roles linguistically, so we have identified these roles in metaphorical expressions to reveal cross-linguistic contrasts.

5. Results

5.1 BOILING/HERVIR as a source frame

The lexical units *boil* and *hervir* evoke a shared prototypical frame depicting schematic knowledge of the single event BOILING in the COOKING cognitive domain, configuring a set of participant roles (core or peripheral) in Spanish and English (see Figure 3). A cook [AGENT] heats a liquid [THEME] in a container (a pot) [LOCATION] utilising a device (stove) [INSTRUMENT] until it reaches its boiling point, as vapour and bubbles emerge (boiling as an activity). The cook puts some raw ingredients [PATIENT] into the liquid boiling in the container, and these ingredients remain there for some time until they undergo chemical changes, resulting in cooked food [RESULT] (boiling as an accomplishment). Thus, carbohydrates soften (e.g., pasta, rice, potatoes), whereas proteins harden (e.g., eggs). In addition, liquids may play the [PATIENT] role (instead of the [THEME] role) in an accomplishment, as they are boiled down, resulting in a denser substance (e.g., sauces, syrups).

The most frequent collocates of *boil* and *hervir* in COCA and CEWD confirm that the literal use of these words is usually related to cooking in both languages. As observed in Figures 1 and 2, the most frequent collocations in both languages involve cooking participant entities (e.g., water, heat, reduce, high, salted, minutes, cook, pot, saucepan stirring), as well as a few lexical units that evoke metaphorical senses described in this section (e.g., *boil down*, *boiling blood* / *hervir la sangre*).



Figure 1. Most frequent collocates for *boil* in COCA

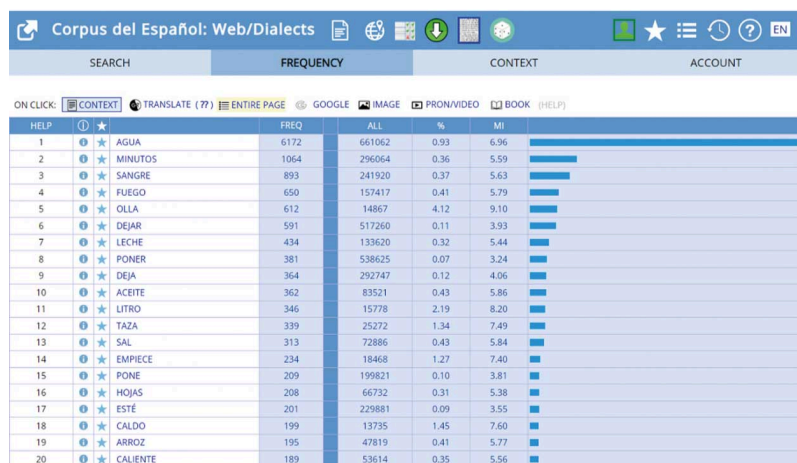


Figure 2. Most frequent collocates for *hervir* in CEWD

BOIL/HERVIR frame

Description: A person causes a liquid to boil in a container by applying intense heat through a stove to cook ingredients, resulting in cooked food.

Core FEs

- **Cook/Cocinero/a:** [AGENT] the person intentionally initiating the process
- **Liquid/Líquido:** [THEME] water, broth, stock (an entity undergoing the process as an activity)
- **Ingredients/Ingredientes:** [PATIENT] raw food (an entity affected by *boiling* as an accomplishment)
- **Stove/Fogón:** [INSTRUMENT] appliance producing heat for bringing about the process
- **Pot, pan/olla, cazo:** [LOCATIVE] container for liquid and ingredients
- **Heat/Calor:** [MEANS] heat causing a change in the ingredients
- **Resulting meal/ comida resultante:** [RESULT] the cooked food resulting from the process

Figure 3. BOILING/HERVIR as an SF in English and Spanish

Each core FE is assigned a semantic role in the schematic BOILING event structure. This frame semantic configuration results from our analysis of the corpora collocations and coincides in both languages.

5.2 English target frames

5.2.1 SYNTHESISING INFORMATION

The most frequent metaphorical sense of English *boil down* is SYNTHESISING INFORMATION (339 tokens; 11.3% of the 3,000 *boil* COCA occurrences; 46.06% of the *boil* metaphorical instances). This TF refers to summarising data or information to its most essential components.

In the orientational metaphor SYNTHESISING INFORMATION IS BOILING LIQUID DOWN, the cook maps onto the summariser [AGENT]. The synthesised entity, conceptualised as boiling liquid [THEME] or ingredient [PATIENT], is reduced to its essential (metaphorically solid and heavy) elements as a result of metaphorical evaporation. In the SF, the resulting substance [RESULT] is concentrated and intense in flavour. Therefore, in the TF, the information or entity loses the non-relevant or non-important parts, and only its essential parts remain as a synthesis [RESULT], as illustrated in (1) and (2):

(1) *His philosophy boiled down to six words: "Play hard; play together; play smart".*
(COCA, NEWS: USA Today, 2015)

(2) *... she's boiling down this information to its most concise elements.*
(COCA, MAG: Hollywood Reporter, 2016)

(1) and (2) show the mapping where synthesising information to its main components or ideas is conceived as boiling down a liquid until it becomes concentrated and dense. As the syntactic subject of the intransitive construction 'X boils down to Y', the entity undergoing the process takes the [THEME] role. In turn, the summary or essential components are assigned the [RESULT] role in the TF, corresponding with the final product in the SF (THEME+V+RESULT).

Moreover, suppose the syntactic subject of *boil down* is an agent (the person summarising information). In that case, the verb is followed by a [PATIENT] (summarised information) and a [RESULT] (the synthesis obtained). In that case, the sense of SYNTHESISING INFORMATION is linguistically manifested by a transitive resultative construction (AGENT+V+PATIENT+RESULT). The LESS IS DOWN primary metaphor motivates the metaphorical sense of *down*, expressing reducing quantity.

5.2.2 SOCIAL ACTION

The second most frequent metaphorical sense of English *boil* is SOCIAL ACTION (179 tokens; 5.97% of *boil* citations; 24.32% of metaphorical instances). This TF represents a social group emotionally moved by a perceived injustice or serious problem affecting them directly. The social group's emotion is conceptualised as

a boiling liquid and their bodies as containers. Protests or violence may intensify if the social group loses control over their negative emotions. The severe problem or injustice directly affecting the social group maps on the heat. The heat is a [MEANS] in the BOILING SF because the frame includes an [AGENT]. No agent exists in the TF, so the [MEANS] role maps onto a [CAUSE] role. Consequently, social action is conceived as vapour bubbles violently rushing to the surface as the liquid boils. In the TF, if the situation gets out of control, people may lose their temper, resulting in intense protests, insults, and violence, which aligns with the liquid overflowing the pot in the SF. Examples (3), (4) and (5) show the three stages of social action caused by injustice.

- (3) ... tensions reach a **boiling point** and family fault lines are exposed.
(COCA, SPOK: PBS NEWSHOUR 6:00 PM EST, 2016)
- (4) ... racial unrest had reached full **boil**. Riots [...] were exploding.
(COCA, MAG: Vanity Fair, 2017)
- (5) *Crime, corruption, and high unemployment plague the country. Frustrations **boiled over** last year. Strikes by platinum mine workers angry with their low wages turned deadly.* (COCA, SPOK: PBS NEWSHOUR 6:00 PM EST, 2013)

As people's negative emotions fall out of control, social tension increases, becoming visible and dangerous, eventually causing social damage, conceptualised as boiling liquid overflowing a pot (*boil over*). Thus, the mappings from the BOILING frame onto the SOCIAL ACTION frame show three successive stages of the boiling process so that the idiomatic expressions *reaching a boiling point*, *getting/coming to a full boil*, and the phrasal verb *boil over* each expresses a different stage metaphorically.

Regarding the FEs' semantic roles, the negative emotion (tension, indignation, resentment, frustration) plays the semantic role of [THEME] as the syntactic subject of an intransitive construction (THEME+V). *Boiling point* [RESULT1], *full boil* [RESULT2], and *boil over* [RESULT3] express the three resulting stages in the SOCIAL ACTION frame, the latter entailing violence and damage.

The phrasal verb *boil over* appears in intransitive constructions where the negative emotion causes damage in the TF (THEME+V+RESULT3). In this regard, the particle *over* renders the metaphorical sense of flowing over the edge and out of a container.

As an adjective (*boiling point*), *boiling* indicates the start of anger, and as a noun (*reach a full boil*), the climax of the social turmoil. Thus, a negative emotion caused by events in people is expressed metaphorically as unrest, frustration or anger boiling in people. In this metaphor, the cause of social unrest is envisaged as

the heat ([MEANS] in the SF), and the people affected as the container or location (THEME+V+MEANS+LOCATION).

5.2.3 SKIN ABSCESS

The SKIN ABSCESS TF occurs in 29 tokens (0.97% of occurrences; 3.94% of metaphorical instances). This TF depicts skin inflammation and swelling due to an infection, causing sting or sharp pain. It manifests as red-coloured spots on the skin, incidentally producing purulence.

Pus is envisaged as a boiling liquid. Hence, the infection that causes the purulence maps on the heat, making the liquid boil. The persistent stinging sensation in the skin abscess is conceived as the rough movement of vapour bubbles. The oozing purulence maps onto the bubbling vapour. Example (6) depicts the abscess as a boil causing pain.

- (6) *Nanne could hold her son, even when he was covered in oozing red boils.*
(COCA, FIC: Analog Science Fiction & Fact, 2016)

Regarding semantic roles, the infection as the cause of skin inflammation in the TF correlates with the heat [MEANS] in the SF. The skin boil (pus) assumes the [THEME] role. Finally, the resulting bubbles map onto the purulence oozing out (THEME+V+MEANS+RESULT). In this frame, the word *boil* is always used as a noun.

The idiom *to lance the boil*³ is a source-based extension of the skin inflammation sense of *boil*. According to the *Farlex Dictionary of Idioms* (2015), *lance the boil* means “to take a decisive and dramatic action that resolves or puts an end to a problematic, troublesome, or unpleasant situation”. The troublesome situation resolved by a dramatic action is construed as the painful skin boil that needs lancing to provide relief.

5.2.4 STORM CLOUDS

The BOILING SF stands for the STORM CLOUDS TF in 16 tokens (0.53% of citations; 2.17% of metaphorical instances). The STORM CLOUDS frame refers to stormy clouds moving fast and energetically in the sky. The mental image of storm clouds is expressed as a liquid at a full or rolling boil, furiously bubbling and generating vapour. It is, therefore, an image metaphor grounded in visual perception and similarity.

- (7) *Malone's mount mustered a single squint-eyed glance in the direction of the crackling, boiling cloud.* (COCA, FIC: Fantasy & Science Fiction, 2015)

3. This idiomatic expression was identified only once in our sample.

- (8) *...the million Lesser Suns should have filled the night sky beyond that, thick black clouds boiled and rippled.* (COCA, FIC: The shadowed sun, 2012)

Examples (7) and (8) depict clouds' fast and rough movement, evoking the image of boiling liquid forming vigorous bubbles and vapour. The adjective *boiling* (7) and the verb *boil* (8) express the STORM CLOUDS frame. Clouds take the [THEME] semantic role in an intransitive construction (THEME+V).

5.2.5 EMERGING ENTITIES

The EMERGING ENTITIES TF is expressed in 15 tokens (0.5%; 2.04% of metaphorical instances). This TF involves entities coming into existence as vapour bubbles popping up on a boiling liquid, thereby becoming apparent, as in (9) below:

- (9) *The Beauteous Buccaneer was a dark divertissement, replete with long shadows, choruses of wailing nereids, and misterioso trills boiling up from the orchestra pit.* (COCA, FIC: Galapagos regained, 2015)

The phrasal verb *boil up* evokes the EMERGING ENTITIES frame since the emerging sounds are construed as the bubbles rising to the surface of a boiling liquid (music becomes more intense) in a pot (orchestra). The particle *up* renders the sense of becoming apparent (arising). The [THEME] role is assigned to the emerging entities (musical trills) in an intransitive construction (THEME+V+LOCATIVE).

5.2.6 KEEPING INTEREST

The KEEPING INTEREST TF (3 tokens; 0.1% of the sample occurrences; 0.41% of metaphorical instances) configures a situation involving intense interest or activity. People's interest persists by being kept in the spotlight. Keeping a topic on the boil conceptualises it as an ingredient in a boiling pot. The liquid keeps boiling as long as intense heat is applied. Likewise, a situation remains relevant in the TF, providing that people keep talking about it.

- (10) *The debate over Hillary Clinton's email practices as secretary of state is back on the boil.* (COCA, SPOK: PBS NEWSHOUR 6:00 PM EST, 2016)
- (11) *The president already has enough spokespersons in a notoriously hostile anti-press communications shop, [...] to keep the pot boiling in his fake-news assault on the fourth estate.* (COCA, NEWS: Baltimore Sun, 2017)

In (10) and (11), the KEEPING INTEREST frame manifests linguistically through the idiomatic expressions *on the boil* and *keep the pot boiling*. The topic of interest appears as the ingredient kept on boiling in the media (pot), and an intentional agent may be explicit as the cook in the process (AGENT+V+PATIENT+LOCATIVE).

5.2.7 PSYCHOLOGICAL TOUGHNESS

The BOILING frame maps onto the PSYCHOLOGICAL TOUGHNESS frame in 3 tokens (0.1% of the sample; 0.41% of metaphorical instances). This TF configures a tough, determined and unsentimental person whose rugged and robust character is envisaged as the result of a process whereby an ingredient becomes hard-boiled through intense heat. The idiomatic metaphorical expression *hard-boiled* evokes boiled eggs, resulting in solidified white and yolk.

As an extension, *hard-boiled* is typically employed in crime and detective novels featuring a tough protagonist, as (12) illustrates:

- (12) *...there is a darkness to those hard-boiled detective novels where you have the smart and, you know, sort of basically good protagonist.*

(COCA, SPOK: AXE FILES 12:00 AM EST, 2016)

Moreover, the idiom *hard-boiled* is constantly utilised as an adjective when evoking the PSYCHOLOGICAL TOUGHNESS frame. The rugged, rigid person is viewed as the ingredient submitted to a boiling heat (life ventures) for a long time that has become excessively cooked (*hard-boiled* +PATIENT+MEANS).

5.2.8 SEXUAL AROUSAL

Boil evokes the SEXUAL AROUSAL TF, depicting a sexually aroused person. The human body is envisaged as the cooking container, and the emotion of sexual desire or pleasure correlates with the boiling liquid.

- (13) *She was a pot boiling over, and she liked it.*

(COCA, FIC: The devil takes a bride, 2015)

- (14) *Her body rumbles and naps, the rolling boil of her pleasure absorbing Chuck like a particle of salt.*

(COCA, FIC: Gettysburg Review, 2015)

- (15) *When he was close to the boiling point, his hands shifted to my shoulders.*

(COCA, FIC: Flash burned, 2017)

Examples (13), (14) and (15) illustrate different linguistic realisations of the metaphor. In (13), the woman's body is explicitly referred to as a pot [LOCATIVE] containing an immense feeling of pleasure [THEME] conceived as a liquid about to overflow (*boiling over*) the pot. In (15) and (14), *the boiling point* and *the rolling boil* represent the beginning and ongoing process of sexual arousal,⁴ respectively.

4. *Hervir* can also be used in Spanish with sexual connotations. However, we did not identify explicit mappings in the CEWD.

5.3 Spanish target frames

5.3.1 MENTAL EXHAUSTION

This *hervir* TF is not found in English. It appears in 2 tokens (0.07% of the 3,000 instances; 1.05% of the metaphorical instances of *hervir* in CEWD). This frame involves a mentally drained person due to excessive mental stress. An overworked brain causes malfunction, both physically and mentally. The person is conceived as the container [LOCATIVE], the affected overworked brain as the boiling substance [THEME], and the heat [MEANS] as febrile thinking.

(16) Spanish

(CEWD, <http://planetagea.wordpress.com/2013/05/06/impresionante-cme-de-m5-7-el-pasado-3-de-mayo-y-no-viene-sola-otras-3-m-bajas-desde-el-1-de-mayo-astronomos-sorprendidos-por-una-explosion-de-rayos-gamma-sin-precedentes-el-pasado-27-de-abril/>)

Con horas de pensamiento mi cerebro hervía.

with hours of thought my brain was-boiling.

'After hours of thinking, my brain was bursting.'

Hervir indicates mental exhaustion in collocation with *cerebro* ('brain') (16),⁵ and *cabeza* ('head'), which take the [THEME] role (THEME+V+MEANS).

5.4 Target frames shared by English and Spanish

5.4.1 FEELING ANGER/ENFADO

English *boil* occurred in 117 tokens (3.9%; 15.9% of metaphorical instances), and 130 instances of Spanish *hervir* (4.3%; 68.07% of metaphorical instances) evoke the FEELING ANGER/ENFADO frame. The prototypical FEELING ANGER frame consists of a person feeling intense, unpleasant anger caused by a perceived threat or an emotional hurt (Kövecses, 1986, 2003; Kövecses et al., 2015; Lakoff & Kövecses, 1987).

Anger is conceived as a boiling liquid [THEME], and the unkind circumstances triggering anger are conceived as the heat [MEANS] causing the liquid to boil. As people feel angry, their bodies experience physical and mental agitation, which correlates with vapour and emerging bubbles [RESULT]. The boiling container [LOCATION] maps onto the human body. The following examples illustrate the mapping:

5. The *Leipzig Glossing Rules* are employed for the translation of examples. Retrieved from <https://www.eva.mpg.de/lingua/pdf/Glossing-Rules.pdf> on July 21, 2022.

- (17) *Anger boiled inside her.* (COCA, MAG: Mother Jones, 2012)
- (18) *The mere thought of Margo and her underhanded tactics could make her blood boil.* (COCA, FIC: Driving heat, 2015)
- (19) *Instead of boiling with rage at her attitude, I just rolled my eyes.* (COCA, FIC: Fantasy & Science Fiction, 2013)

In (17), anger appears as a liquid boiling inside the human body. Furthermore, *boil* usually collocates with *blood*, as in (18), where heat maps onto unpleasant circumstances (Margo's underhanded tactics). In addition, the metaphor FEELING ANGER IS A BOILING LIQUID is also typically expressed by *boil with* plus the negative emotion (19).

As for semantic roles, the subject of the verb *boil* is the [THEME], as in (17) (THEME+*boil*+LOCATIVE), or the [LOCATIVE] (container) (LOCATIVE+*boil with*+THEME), as in (19). Moreover, when *boil* is part of a causative construction (*make*+obj.+bare infinitive), the verb *make* is preceded by the [CAUSE] that prompts the emotional feeling (CAUSE+*make*+THEME+*boil*V), as in (18).

Regarding Spanish, Examples (20) and (21) illustrate the unpleasant facts or circumstances provoking anger construed as the heat (*facts*) making the liquid boil (*anger*):

- (20) Spanish
(CEWD, <http://beticos.alfinaldelapalmera.com/profiles/blogs/madrid-real-betis>)

Quando quieren hacer o creer ver de que somos un equipo pequeño de
when (they) want do or think see of that (we) are a team small of
esta forma pues que queréis que os diga, me hierva la sangre.
this way so what (you)want that to you (I)say, to me boils the blood
'When they want to show or pretend that we are a small team in this way, what can I say? My blood boils.'

- (21) Spanish
(CEWD, http://www.notengotele.com/viajes_eventos/si-esto-no-es-amor-no-se-que-puede-ser-una-madre-le-canta-a-su-hija-que-esta-a-punto-de-morir)

Es cierto que la población está anestesiada y se traga cualquier
(it) is true that the population is anesthetized and swallow any
basura, pero calificarlo de forma tan brusca y áspera por tu parte, hace
trash, but describe it of way so rude and harsh for your part, makes
que me hierva la sangre.
that to-me boil the blood.
'It is true that the population is numb and they fall for any crap, but your describing it so rudely and harshly makes my blood boil.'

The Spanish expression of the metaphor is similar to English, as the verb *hervir* ('boil') also collocates with *sangre* ('blood'). However, English shows various possible expressions of the [THEME] role in addition to *blood*. In contrast, only *blood* appears as [THEME] in the Spanish corpus since 123 out of 127 instances explicitly show the collocation *sangre+hervir* ('blood'+ 'boil').

The semantic roles in the Spanish TF are (MEANS(cause)+THEME (blood)+V+LOCATIVE (person)). Only [THEME] (SF liquid) and [LOCATIVE] (SF container) get mapped in English if the [THEME] is other than *blood*. Moreover, the expressions mapped onto the [THEME] role are *anger*, *rage*, *outrage*, and other synonyms, in addition to *blood*.

The container [LOCATIVE] maps onto the person suffering the emotion, and the heat [MEANS] onto its cause. The four remaining instances in the Spanish corpus express the person boils because of anger, that is, the person as the [THEME] and the emotion as the [MEANS] causing the boil. In these cases, the construction used is (THEME(person)+*hervir de* 'boil of'+CAUSE (anger, rage, fury, ...)).

5.4.2 CALOR AMBIENTAL EXTREMO/EXTREME ENVIRONMENTAL HEAT

The EXTREME ENVIRONMENTAL HEAT/CALOR AMBIENTAL EXTREMO TF manifests in 16 tokens (0.53%) in English and 16 tokens (0.53%) in Spanish; 2.17% of metaphorical instances in English versus 8.38% in Spanish. The TF expresses a situation where the temperature is exceptionally high, as perceived by humans. Living creatures may feel that blistering heat suffocating, and it may also affect non-living physical entities.

Regarding conceptual projections, both in English and Spanish, the sun is conceived as the stove generating heat. In turn, the heat affects entities that correlate with the ingredients in the SF. These undergo specific chemical changes under the effect of heat. Examples (22), (23), and (24) illustrate different ways in which *boil* activates the frame in English.

(22) *You must be boiling. It's hot out here.* (COCA, FIC: Texas Review, 2014)

(23) *It's getting a little dark. Like eight o'clock. It's goddamned boiling.*
(COCA, FIC: Caught dead: a Rick Van Lam mystery, 2014)

(24) *It was a boiling day in June, and we graduates all budding biologists and chemists and physicists sprawled in folding chairs on the lawn.*
(COCA, MAG: Popular Science, 2015)

As a participial adjective, *boiling* emphasises how torrid the atmosphere is (24) or forms part of impersonal sentences about the weather, implying the sweltering heat (23).

Concerning semantic roles, the affected entity takes the [THEME] role as the subject of the verb *boil* (22). The SF contributes the [THEME] (ingredients) and the [LOCATIVE] (container) roles. These roles map onto the person or entity suffering the heat and the environment, respectively (THEME+V+LOCATIVE). Through a metonymic operation, the [LOCATIVE] role may occur as the subject of the verb *boil* (the pot boils). Examples (25) and (26) illustrate this metaphor in Spanish.

(25) Spanish

(CEWD, <http://www.farodevigo.es/portada-ourense/2013/08/22/incendios-provocados-hora-rodean-ourense/864503.html>)

Ourense hervía, a primera hora de una tarde tórrida con alerta
Ourense was-boiling, at first hour of an afternoon torrid with alert
naranja por calor.
orange for heat.

‘Ourense was boiling, in a torrid early afternoon with orange heat alert’

(26) Spanish

(CEWD, <http://untaljesus.net/texesp.php?id=1500105>)

Elías [...] echó a andar a través del desierto, con el sol hirviéndole
Elías [...] threw to walk through of-the desert, with the sun boiling-him
sobre la cabeza.
above the head

‘Elías [...] set off through the desert, the sun boiling (him) on his head’

In contrast to the English *boil*, *hervir* is always a verb rather than a participial adjective in this TF. *Hervir* stands for the feeling of extreme heat. Ourense in (25) is the container under the solar heat. In this metaphorical expression, the environment as a container operates over a metonymy (*pot* for *liquid*). Elías in (26) is conceived as the boiling ingredient, adopting the [PATIENT] role as a heat receiver. As a natural cause, the sun would align with the cooking stove. However, in this case, it is used as the subject of the verb and, therefore, acquires agentive tones, as if intentionally putting energy into the process.

The TF consists of a person (or other entities) suffocated in a hot environment under the sun: (PATIENT+V+LOCATIVE+MEANS/AGENT).

5.4.3 INTENSE MENTAL ACTIVITY/ACTIVIDAD MENTAL INTENSA

The INTENSE MENTAL ACTIVITY TF occurs in 9 English (0.3%; 1.22% of metaphorical instances) and 3 Spanish tokens (0.1%; 1.57% of metaphorical instances). This TF consists of a person whose mind is highly active, “overflowing” with positive thoughts and ideas.

The mappings from the BOILING SF onto the INTENSE MENTAL ACTIVITY TF show that the head/brain/mind/person appears as the boiling container [LOCATIVE], whereas thoughts and ideas are viewed as a liquid [THEME].

- (27) *Evolution of sound Videos of Sean performing during this era show a young man boiling with ideas, his eyes half-closed or startled wide, the lyrics exploding out of him like steam from a pressurised kettle.*

(COCA, NEWS: Atlanta Journal Constitution, 2014)

English *boil* evokes metaphorically intense mental activity, as (27) illustrates in the construction: (LOCATIVE+*boil with*+THEME). Thus, the young man, generating a constant stream of ideas, is understood as a *kettle* [LOCATIVE] containing boiling water [THEME] that produces a steady flow of steam [RESULT].

- (28) Spanish

(CEWD, http://www.uplis.com/terry-gilliam/documental-lost-in-la-mancha-video_10b4bba16.html)

Gilliam, una mente caótica y genial donde hierve una imaginación

Gilliam, a mind chaotic and great where boils a imagination *desbordante*.

boundless.

'Gilliam, a chaotic and brilliant mind where a boundless imagination boils.'

In Spanish, (28) shows Gilliam as a container [LOCATIVE] of boiling liquid (imagination) as a subject [THEME] that overflows ('*desbordante*') [RESULT].

5.4.4 BUSTLING WITH PEOPLE/ACTIVITY

The BUSTLING WITH PEOPLE/ACTIVITY TF represents a crowded place full of human activity. It is evoked in 4 English (0.13%; 0.54% of metaphorical instances) and 37 Spanish tokens (1.23%; 19.37% of metaphorical instances). In this metaphor, the cooking container maps onto the place [LOCATIVE], and people's lively activity correlates with the boiling liquid [THEME]. Noise and movement align with vapour and bubbles [RESULT₁]. An outburst of activity is conceived as the liquid overflowing the pot's rim [RESULT₃].

- (29) *Life boiled around her: the dog barked somewhere, girls laughed balancing a hula hoop.* (COCA, FIC: Literary Review, 2016)

- (30) *Outside, the city boiled over with life, a great bubbling cauldron of sights and people.*

(COCA, FIC: The-most-eligible-bachelor-romance-collection:-nine-historical-romances-celebrate-marrying-for-all-the-right-reasons, 2016)

The English TF shows the bustling activity (*life*) conceptualised as the boiling liquid [THEME] in (29). The city is construed as a huge *bubbling cauldron* [LOCATIVE] in (30), where the boiling liquid (the hustle and bustle) overflows (*boiling over*). The English data render the constructions (THEME+*boil*V) and (LOCATIVE+*boil*V+*over*+ *with*+THEME).

Likewise, the constructions (LOCATIVE+*hervir*V) and (LOCATIVE+*hervir*V de+THEME) are common realisations of this TF in Spanish.

- (31) Spanish (CEWD, <http://blogs.elcorreogallego.es/letrada/page/2/>)
Ayer la mayoría de los despachos de abogados de España hervían de
 yesterday the majority of the firms of lawyers of Spain were-boiling of
tanta actividad [...].
 so much activity [...]
 ‘Yesterday, most law firms in Spain boiled with so much activity’

- (32) Spanish (CEWD, <http://blogs.larioja.com/logronobares/>)
Las Cañas hervía casi durante toda la jornada, el sueño de
 Las Cañas was boiling almost during all the day, the dream of
cualquier hostelero.
 any innkeeper
 ‘Las Cañas boiled almost all day, the dream of any innkeeper’

Law firms (31) and the specific area of the city (32) map onto containers [LOCATIVE] boiling with activity [THEME].

5.4.5 ROUGH SEA/MAR GRUESA

The ROUGH SEA TF is evoked by 3 English *boil* (0.1%; 0.41% of metaphorical instances) and 3 Spanish *hervir* tokens (0.1%; 1.57% of metaphorical instances). The prototypical ROUGH SEA TF consists of a choppy ocean configuration, usually during a storm caused by strong winds. The rough sea is viewed as a liquid [THEME] boiling furiously. The seafoam from the agitated waters is construed as vapours and bubbles emerging from boiling water [RESULT]. Like in the STORM CLOUDS frame, this image metaphor is motivated by visual similarity.

- (33) [...] *each one became subsumed by the image and the weight of a dark ocean boiling.*
 (COCA, FIC: Iowa Review, 2016)

Example (33) shows a choppy ocean conceived as a boiling liquid, vigorously moving and generating sea foam. The water adopts the [THEME] role in an intransitive construction (THEME+V).

- (34) Spanish (CEWD, <http://garciala.blogia.com/temas/literatura-y-critica.php>)
En el acto se alzaron olas y huracanes, el mar hirvió.
 in the act raised waves and hurricanes, the sea boiled.
 ‘suddenly, hurricanes and waves raised, the sea boiled’

Waves map onto boiling bubbles (34) in Spanish. Thus, the ROUGH SEA TF materialises via the construction (THEME+*hervir*), as in English.

6. Discussion

Firstly, contrastive analysis of metaphorical mappings identifies which metaphors exist only in either one of the languages compared. Secondly, metaphors that associate the same conceptual source and target in the two languages may differ in their conceptual elaboration so that semantic roles map differently. Finally, even though the same semantic roles get mapped, languages may differ in the kind of linguistic realisation –lexical or constructional– and the frequency of use.

Our data indicate that the scope of the *BOILING* SF differs in English and Spanish. Figure 4 shows a set of TFs evoked only in English in the blue square, whereas just one is idiosyncratic for Spanish in the green square. These results indicate that the *BOILING* frame has a broader scope as an SF in English than the *HERVIR* frame in Spanish. Since the scope of an SF is an indicator of cultural saliency, the results suggest that the *BOILING* frame is culturally more salient and relevant in English than the *HERVIR* frame in Spanish.

English emphasises the result of the process (i.e. *boil down*, *boil over*). Accordingly, several metaphors in English map the final stage in the boiling process onto a resultative expression of the TF.

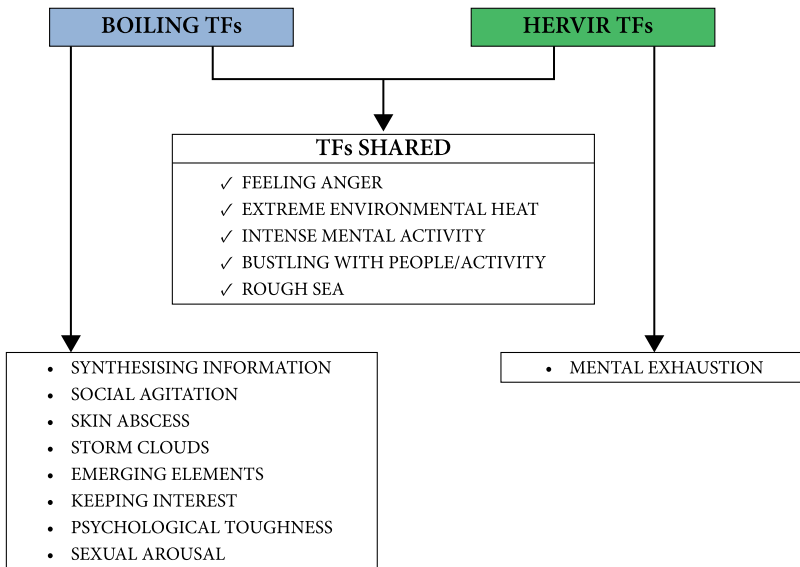


Figure 4. *BOILING* and *HERVIR* TFs

The result of boiling a liquid may be either reducing it through evaporation (*boil down*) or making it overflow the edges of its container through intense heat (*boil over*). An earlier stage in the boiling process refers to the liquid rising (*bubble up*). English expresses diverse stages of the process in several TFs, whereas Spanish does not produce these mappings. Thus, our results show that the SOCIAL ACTION frame may be linguistically realised variously depending on the stage of the emotional process: result₁ (*boiling point*), result₂ (*full boil*), and result₃ (*boil over*). The SYNTHESISING INFORMATION frame emphasises the final result of evaporation (*boil down*), the PSYCHOLOGICAL TOUGHNESS frame focuses on the result as a boiled ingredient (*hard-boiled*), and the EMERGING ELEMENTS frame depicts the intermediate stage as the liquid rises (*boil up, bubble up*). In addition, English maps the [AGENT] role and the boiling transitive process in several metaphors, indicating the prominence of the BOILING frame as part of the COOKING domain in that culture.

Only one Spanish TF is not shared by English. The MENTAL EXHAUSTION frame emphasises thinking (heat) as the cause of brain (substance) exhaustion. The Spanish mapping points to a negative connotation of febrile activity (THEME+hervir). The label “exhaustion” suggests a TF entailment absent in the SF. Only two semantic roles are used explicitly in metaphorical expressions of this TF, [THEME] (liquid) and [MEANS] (heat), which map onto the brain/head and the cause of its suffering. The mapping, nevertheless, does not exploit the richness of the SF.

Figure 4 shows that both languages draw upon the SF to conceptualise the set of TFs in the white square. Both languages emphasise the heat and intensive movement involved in boiling in these shared metaphors.

Regarding the ENVIRONMENTAL HEAT TF, both languages map the [THEME] and the [LOCATIVE] roles so that the mapping functions similarly. However, a single instance in the Spanish corpus (26) shows a creative pattern where the sun, as the syntactic subject of the verb, adopts the [AGENT] role, and the person under heat assumes the [PATIENT] role. Since only one example of this pattern has been found, we consider this use an individual creative innovation rather than a frequent expression showing cross-linguistic divergence.

The INTENSE MENTAL ACTIVITY TF highlights an abundant stream of thoughts in both cultures. The [THEME] and [LOCATIVE] roles in both languages occur in diverse expressions that expand the metaphor by mapping the process results. Thus, in English, bubbles and steam map on the lyrics of songs as a result of intense thinking. In contrast, the overflow is mapped onto abounding imagination in Spanish.

The BUSTLING WITH PEOPLE/ACTIVITY maps the [THEME] and [LOCATIVE] roles in both languages, which shows that the metaphor functions similarly. When

evoking the BUSTLING WITH PEOPLE/ACTIVITY TF, the arising bubbles are conceptualised as something positive (denoting life and cheerfulness). This connotation contrasts with their negative tone in the SKIN BOIL, SOCIAL ACTION and STORM CLOUDS TFs.

Finally, the ROUGH SEA mapping is relatively simple, including only [THEME], the boiling liquid, as an explicit role, being the ocean waves' motion an entailment in both languages.

The results show that all the metaphors shared by English and Spanish primarily restrict their mappings to [THEME] and [LOCATIVE]. Other roles are only added to the usual mapping in some sparse creative uses. This predominance of the [THEME] and [LOCATIVE] roles in the shared metaphors suggests that these roles are core to the frame and less culturally marked.

Concerning the linguistic expression of the shared metaphors, our findings suggest that the BOILING frame seems more elaborated in English overall. English incorporates phrasal verbs with resultative aspect, like *boil over*, *boil up* and *boil down* and uses various constructions like the intransitive construction (THEME+V+LOCATIVE), or the (LOCATIVE+boilV+with+THEME) construction that conveys an intensifying meaning. English also expresses the process through resultative adjectives (*hard-boiled*), participles (*boiling point*) or nominalisations (*full boiling*). Though Spanish uses the (THEME+LOCATIVE) and the (LOCATIVE+hervirV+de+THEME) constructions, there is no categorial variation to express the process, always instantiated by the verb *hervir*. This divergence in linguistic expression may be due to the grammatical characteristics of Spanish and English. For example, the fact that English has phrasal verbs and is a satellite language facilitates the expression of resultative and motion meanings (boil down, boil over).

Thus, the FEELING ANGER TF is expressed as (THEME+boilV) using a variety of synonyms for *anger* or by the collocation *blood+boilV*. In contrast, in Spanish, the FEELING ANGER ('enfado') TF overwhelmingly appears in the collocation *sangre+hervirV* ('blood'+ 'boil'V).

The third parameter for cross-linguistic contrast is the relative frequency of the mappings and metaphorical expressions. Concerning the relative frequency of the BOILING and HERVIR SFs and their mappings onto TFs identified in COCA and CEWD, *boil* is significantly more metaphorical (24.53%) than *hervir* (6.37%). The broader scope of the frame in English is appreciated in the number of TFs that the English language conceives through this SF, as illustrated in Figure 5.

Figure 5 shows the distribution of the BOILING and HERVIR TFs. The English SYNTHESISING INFORMATION frame stands out over the other metaphorical extensions.

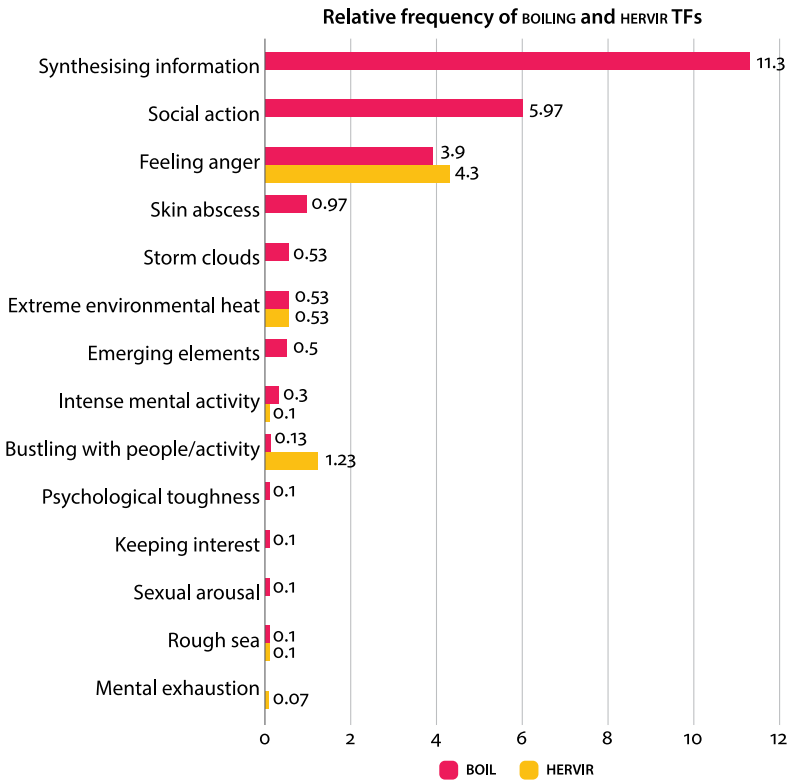


Figure 5. Relative frequency of BOILING and HERVIR TFs in COCA and CEWD

Table 1 outlines the relative frequency of the shared metaphors in both languages.

Leaving aside the fact that *sangre+hervir*V (‘blood’+‘boil’V) is a reasonably frequent collocation expressing anger in Spanish (Spanish FEELING ANGER TF-RF 4.3%; TF-MRF 68.07%), the most idiosyncratic frame in Spanish, in contrast with English, is the one expressing lively activity (TF-RF 1.23%; TF-MRF 19.37%) since it outnumbers its English counterpart overwhelmingly (TF-RF 0.13%; TF-MRF 0.54%). This high relative frequency of the BUSTLING WITH PEOPLE TF suggests that it seems considerably more salient in Spanish than in English. The semantic roles mapped coincide in English and Spanish, showing that these five metaphors function similarly in these languages, which raises the hypothesis of their potential universality.

Table 1. TF frequency of shared metaphors in English and Spanish

Shared TFs	English			Spanish		
	TF-AF*	TF-RF*	TF-MRF*	TF-AF	TF-RF	TF-MRF
FEELING ANGER	117	3.9%	15.9%	130	4.3%	68.07%
EXTREME ENVIRONMENTAL HEAT	16	0.53%	2.17%	16	0.53%	8.38%
INTENSE MENTAL ACTIVITY	9	0.3%	1.22%	3	0.1%	1.57%
BUSTLING WITH PEOPLE/ACTIVITY	4	0.13%	0.54%	37	1.23%	19.37%
ROUGH SEA	3	0.1%	0.41%	3	0.1%	1.57%

* TF-AF = TF Absolute frequency per 3,000 tokens of the culinary term type

* TF-RF = TF Relative frequency per 3,000 tokens of the culinary term type

* TF-MRF = TF relative frequency against the total number of metaphorical instances.

Table 2 shows the relative frequency of the metaphors appearing exclusively in English or Spanish. Spanish only uses a single idiosyncratic TF, representing a mere 1.05% of the total metaphorical usage. On the other hand, English exploits the SF in various idiosyncratic metaphors. The two metaphors at the top represent 70.38% of the metaphorical expressions in the English corpus, indicating that these metaphors are deeply ingrained in the language.

Table 2. Frequency of alternative TFs in English and Spanish

Alternative TFs in English	TF-AF*	TF-RF*	TF-MRF*
SYNTHESISING INFORMATION	339	11.3%	46.06%
SOCIAL ACTION	179	5.97%	24.32%
SKIN ABSCESS	29	0.97%	3.94%
STORM CLOUDS	16	0.53%	2.17%
EMERGING ELEMENTS	15	0.5%	2.04%
KEEPING INTEREST	3	0.1%	0.41%
PSYCHOLOGICAL TOUGHNESS	3	0.1%	0.41%
SEXUAL AROUSAL	3	0.1%	0.41%
Alternative TF in Spanish	AF	T-RF	M-RF
MENTAL EXHAUSTION	2	0.07%	1.05%

* TF-AF = TF Absolute frequency per 3,000 tokens of the culinary term type

* TF-RF = TF Relative frequency per 3,000 tokens of the culinary term type

* TF-MRF = relative frequency against the total number of metaphorical expressions.

The mappings elicited for English might also exist in Spanish, though our corpus has not rendered any instances. Consequently, according to our data, we cannot postulate these metaphors in Spanish. Therefore, our results reveal that the BOILING SF in English is highly productive of metaphorical mappings and expresses a variety of TFs in the conceptual system (13 metaphors), whereas Spanish only shares five of these metaphors.

Another issue is the relative importance of the mappings representing either a low or high percentage of the observed figurative expressions. If we consider the most frequent TFs, SYNTHESIZING INFORMATION (46%), SOCIAL ACTION (24%) and FEELING ANGER (16%) account for over 85% of the metaphorical instances in the English sample. ANGER (68%) and BUSTLING WITH PEOPLE/ACTIVITY (19%) cover 88% in the Spanish sample. These high percentages make these metaphors interesting material for foreign language teaching concerning metaphorical competence. We see that FEELING ANGER is shared and significant in both languages, favouring the teaching of similarities. On the other hand, SOCIAL ACTION contrasts with BUSTLING WITH PEOPLE/ACTIVITY in terms of negative versus positive connotations, a fact that should be emphasised as a difference in the foreign language classroom.

In this regard, metaphor awareness involves the capacity to discern the non-arbitrary nature of cross-cultural and cross-linguistic divergences inherent in the linguistic manifestations of metaphorical expressions (Boers, 2004; Littlemore & Low, 2006). Therefore, when instructing a language, it is crucial to contextualise these nuances by contrasting them with other lexical units associated with the same domain, as each language may focus on particular FEs and, therefore, the TFs may diverge. For example, *bake* and *hornear* do not convey identical metaphorical senses (Esbrí-Blasco & Navarro i Ferrando, 2023). Similarly, *boil* and *hervir* may place the experiential focus on different FEs. O'Reilly & Marsden (2021, p. 26) define metaphoric competence as “the comprehension, production, awareness, and retention of metaphor in speaking, writing, reading and/or listening”. The contrasts shown here contribute an extended view of metaphoric competence (Littlemore & Low, 2006) since the cross-linguistic divergence regarding the thematic roles mapped in each metaphor may influence the expression of the TFs both conceptually and formally. A conscious exploration of the similarities and differences of metaphorical conceptualisation in different languages can provide a notable enhancement in the learners' depth of knowledge of the foreign language, as well as a significant improvement in their ability to retain metaphoric language (Boers, 2000; Deignan, Gabrys & Solska, 1997; Taki, 2011). Hence, incorporating thematic roles in the analysis of metaphoric mappings in the language classroom can prompt a more comprehensive language learning experience for students.

In this context, the findings of our study align with the perspectives of scholars who emphasize the importance of cross-linguistic studies in language teaching, advocating the integration of metaphor awareness into language curricula. This research adds the thematic role factor to cross-linguistic contrastive semantics of metaphor, signalling contrasts even when the languages share SF and TFs. Therefore, our results contribute to enhancing the concept of metaphoric competence and can serve as a valuable resource for educators aiming to improve metaphoric competence among language learners.

7. Conclusions

According to our data, the English BOILING SF shows a much larger scope than the Spanish HERVIR SF (13 TFs versus 6 TFs, respectively). In addition, the absolute frequency of metaphorical occurrences is considerably higher for *boil* (788 per 3,000) than for *hervir* (191 per 3,000).

Beyond our initial expectations, even though the languages analysed share several SF-TF pairings, we conclude that English and Spanish differ in the complexity of their mappings for these two concepts. For English, not only the [AGENT] and the transitive process are relevant in various metaphors (SYNTHESIZING INFORMATION, KEEPING INTEREST), but also the successive resultative stages of the process contribute significantly to the conceptualisation of TFs.

This study expands our knowledge of the BOILING frame as the SF for metaphors in English and Spanish. It delves into the specific conceptual projections of FEs and their semantic roles in metaphorical mappings, showing an innovative way to research cross-cultural metaphor variation and an extended view of metaphoric competence.

The data show that the English BOILING SF is conceptually linked to a substantially higher number of TFs than the Spanish HERVIR SF. This result suggests that the BOILING frame may be culturally more prominent in English than in Spanish. Further research should compare the mappings of other frames in the COOKING domain, like FRY or STEW, among others, to show their relative importance as well as their metaphoric scope in the English and Spanish cultures so that similarities and contrasts may be delineated cross-linguistically for the domain.

Cross-linguistic divergence in the degree of linguistic elaboration of the metaphorical expressions is also shown by our data. The English expressions of the BOILING frame make explicit diverse participants for mapping onto TFs, such as the successive stages of the process and resultative states of semantic roles like [RESULT], which renders metaphorical expressions more elaborated linguistically

than the Spanish ones in evoking specific shared TFs, such as ANGER or EXTREME ENVIRONMENTAL HEAT.

This study adds some elements to the notion of metaphoric competence (Littlemore & Low, 2006), including the variation in the significance of single frame roles in metaphorical mappings. These nuances need to be contextualised in contrast to other concepts in the semantic field –other frames in the cognitive domain– since each language projects concepts onto TDs differently by employing differing, though similar, concepts from the same SD. In addition, a presumed equivalent pair, e.g. *fry-freír*, *bake-hornear*, or *boil-hervir*, may select diverse semantic roles from their SF, resulting in variation in the metaphoric scope (the range of TFs) in each language. In this line, each language confers higher or lower relative significance (measured as metaphoric scope) to different SFs in the same SD. These cross-linguistic contrasts in the relative metaphoric scope of various SFs in the same SD may result in apparently bizarre translation equivalences of the various terms in the same semantic field, e.g., *roast* as equivalent of *freír*, instead of *asar*, in some metaphoric uses. Our qualitative research findings have limited generalisability due to the sample size. On the other hand, the in-depth analysis of particular phenomena reveals hidden issues of interest in contrastive semantics. The study broadens the approaches to analysing metaphor variation within and across cultures.

Further research points to calculating creativity ratios and productivity indexes (Oster, 2010) to establish the importance of particular mappings beyond mere frequency and compare them cross-linguistically.

Moreover, further analysis should also combine the results of metaphoric mapping analysis of other frames in the same domain since concepts like *fry*, *bake*, *stew*, and others in the same domain in English, as well as *freír*, *hornear*, *guisar*, and others in Spanish, provide a range of mappings for similar or even the same TFs in both languages. We hypothesise that overlappings, similarities and divergences among languages in terms of which SF concept and which thematic role maps onto which TF element result in variation in the linguistic elaboration of metaphorical expressions in diverse languages, even though the languages may share the SF and TF in broad terms.

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Dictionary entries












<https://dictionary.cambridge.org/dictionary/english/boil>
<https://www.merriam-webster.com/dictionary/boil>
https://www.macmillandictionary.com/dictionary/british/boil_1
<https://dle.rae.es/hervir?m=form>








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Address for correspondence

Ignasi Navarro i Ferrando
 Universitat Jaume I
 Departament d'Estudis Anglesos
 Avda Sos Baynat s/n
 12071, Castelló de la Plana
 Spain
 ignasi.navarro@uji.es

Biographical notes

Ignasi Navarro i Ferrando is senior lecturer in English Linguistics at *Universitat Jaume I*, Spain. His research interests include spatial semantics, metaphor in discourse, and applications to Foreign Language Teaching and Intercultural Communication. He co-edited *Cognitive and discourse approaches to metaphor and metonymy* (UJI, 2005), *Language systems and cognitive perspective* (Tirant Lo Blanch, 2010) and is the editor of *Current approaches to metaphor analysis in discourse* (De Gruyter Mouton, 2019). He is a co-author of *Culturas cara a cara. Relatos y actividades para la comunicación intercultural* (Edinumen, 2006).

Montserrat Esbrí-Blasco is a Lecturer in the Department of English Studies at Universitat Jaume I. She teaches Lexicology, English Pronunciation and ESP. Her main research interests include metaphor analysis, contrastive linguistics and frame semantics. She has been an active member of GReSCA (Research Group on Applied and Contrastive Semantics) at Universitat Jaume I since 2014. Email: esbrim@uji.es

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