Methodological triangulation in the study of emotion

The case of 'anger' in three language groups*

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This paper explores the value of Conceptual Metaphor Theory (CMT) in the interdisciplinary study of emotion. The insights provided by a quantitative, corpus-based analysis of anger metaphors in three languages (English, Spanish, Russian) are compared to those obtained from two other methodologies of a more psycholinguistic kind: a feature-rating and a labelling task. The three methodologies are used to test in language several hypotheses on cross-cultural differences in anger experiences derived from earlier findings in emotion psychology. The three methods are found to be complementary and provide convergent evidence that support the hypotheses, with each method contributing additional pertinent data on some of the issues addressed. We discuss the contribution of CMT, its relative importance and specificity, and highlight several methodological and analytical adaptations that CMT studies should undergo for its results to become more informative to other disciplines in the study of emotion.

Keywords: emotion, anger, conceptual metaphor, Cognitive Linguistics, cross-cultural psychology, English, Russian, Spanish

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1. Introduction

This paper explores the value of Conceptual Metaphor Theory (CMT) in the interdisciplinary study of emotion. Since the publication of foundational works on emotion metaphors by Lakoff and Kövecses (1987) and Kövecses (1986, 1990), emotion has become a particularly salient topic in CMT research. Over the past quarter of a century, this unwavering popularity has resulted in a proliferation of CMT studies across a wide variety of languages, both Indo-European (e.g., Apresyan & Apresyan, 1993; Soriano, 2005) and non-Indo-European (e.g., Taylor & Mbense, 1998; Yu, 1995), on both so-called basic emotions, such as anger or sadness (Kövecses, 2000; Barcelona, 1986) and social emotions, such as shame, pride, or love (Barcelona, 1995; Kövecses, 1986; Tissari, 2006). Synchronic research on emotion metaphor has been paralleled by diachronic work (e.g., Geeraerts & Grondelaers, 1995), and investigations of the grammatical properties of emotion metaphorical expressions (e.g., Glynn, 2002) have co-evolved with research on emotion metaphors in different discourses (e.g., Beger & Jäkel, 2009).

Given this long and rich history, it would be reasonable to expect CMT to be a particularly interesting linguistic paradigm for the affective sciences, a rapidly growing interdisciplinary field that advocates and implements cross-disciplinary approaches to address the multifaceted nature of emotion. In the affective sciences, the programmatic statement is that any further advance in our current understanding of emotion is only possible through a close collaboration between disciplines and the use of mutually informative methodologies. The importance of language and language-based methodologies has been frequently noted by many emotion scholars: "[…] emotions are not themselves linguistic things, but the most readily available nonphenomenal access we have to them is through language" (Ortony, Clore, & Collins, 1988, p. 8).

However, CMT has not properly joined the affective sciences yet, and the reasons for the current lack of dialogue are partly underpinned by the limitations in CMT itself. One of these limitations is the scarcity of studies attempting to investigate the degree to which the representation of emotions suggested by metaphor coheres with (or diverges from) the descriptions advanced by expert theories of emotion and cross-cultural emotion psychology. While some attempts have already been made in this respect (e.g., Kövecses, 1990, 2000), further metaphor research aiming to link CMT-based insights with the findings in other disciplines to build up cumulative evidence remains insufficient. Similarly, most CMT work on emotion is descriptive, rather than trying to test a-priori hypotheses against quantitative metaphor data.

In this paper, we address these limitations with a focus on the relation between two specific domains: CMT and emotion psychology. The two main goals of our

study are to illustrate (1) whether CMT renders results that are coherent with more psycho-linguistic methods in the study of emotion; and (2) whether these results are coherent with findings in cross-cultural emotion psychology.

For this purpose, three independent methodologies (one of them CMT) are used to test in language several hypotheses stemming from emotion psychology on the experience of anger across cultures. The languages at stake are English, Spanish and Russian, representing different cultural groups for which relevant cultural differences have been identified (cf. Section 2).

In what follows, further detail about these observed differences is provided (Section 2), leading to the formulation of the hypotheses to be tested (Section 2.1). The three methodologies and the resulting datasets are then outlined (Section 3). After presenting the results of each of the three studies (Sections 4.1–4.3), we summarize the findings (Section 5) and discuss their implications for the role of CMT in the affective sciences at large (Section 6).

2. Cross-cultural differences in anger experiences

In both Western and Eastern emotion theories (cf. Shweder & Haidt, 2000), anger is assumed to be a pan-cultural emotional experience (Ortony & Turner, 1990; Scherer, 2009), accurately recognized across cultures in terms of its facial expression (Ekman, 1999; Matsumoto, Yoo, & Chung, 2010) and consistently lexicalized in most languages studied to date (Hupka, Lenton, & Hutchison, 1999).

However, the specific ways in which anger is perceived and experienced can vary across cultures. Among the crucial factors behind this divergence are two global dimensions of cultural variance: Individualism/Collectivism and Power Distance (Hofstede, 2001). The Individualism/Collectivism dimension derives from differences in self-construal style, i.e. in how people define themselves in relation to others in their environment (Markus & Kitayama, 1991; Nisbett, Peng, Choi, & Norenzayan, 2001; Triandis, 1994). In the so-called 'individualistic' cultures, people tend to think of themselves and others as independent 'entities'; therefore, freedom of self-expression, self-autonomy, and pursuit of individuality are emphasized. By contrast, 'collectivistic' cultures favor the 'interdependent' concept of the self, which promotes a view of people as highly interconnected; thus, social harmony and one's belongingness to a group are favored over assertions of individuality. The Power Distance dimension captures the extent to which social inequality within a society is generally tolerated by its members (Hofstede, 2001). In societies with a large degree of power distance, the gap between the subordinates and authority figures (e.g., elders, social superiors)

is socially sanctioned; therefore, respect and formal deference for higher-status people are more valued and maintained. In cultures with low power distance, relationships with other people are less dependent on social status; thus, formal deference, obedience, and respect are comparatively less promoted and expected (Hofstede, 2001).

These two dimensions – Individualism/Collectivism and Power Distance – underpin four aspects of divergence with regard to how anger and other negative other-directed emotions are expressed and regulated in different societies. In what follows, we will briefly outline these aspects.

First, remarkable differences exist with regard to the *expression* and *regulation* (i.e. conscious control) of anger across cultures. In collectivistic, as compared to individualistic cultures, anger is predominantly viewed as a more negative and socially disruptive emotion, i.e., as an emotion that challenges social order and harmony. Thus, while an outward expression of anger is generally more socially acceptable in individualistic cultures with low power distance, like the UK or the USA (e.g., Markus & Kitayama, 1991; Triandis, 1994), traditional collectivistic societies – such as the Tahitian (Levy, 1973), Samoan (Gerber, 1985), Ifalukian (Lutz, 1982, 1988), Japanese (Johnson, 1993), Tongan (Bender, Spada, Rothe-Wulf, Traber, & Rauss, 2012), or Filipino (Lynch, 1979) – tend to censor explicit manifestations of negative other-directed emotions in order to avoid or diminish interpersonal hostility. In collectivistic cultures promoting an interpersonal self-concept and social hierarchy, this discouragement is also maintained by socialization practices: from an early age, children's tantrums and aggressive behaviours are controlled and, from some point onwards, not tolerated by adults (Lutz, 1982; Ward, 1970). Outward expressions of anger are similarly unwelcome in adulthood: a summary report from 21 countries (Fernández, Carrera, Sánchez, Páez, & Candia, 2000) shows that collectivistic, high power distance societies (e.g., Guatemala, India, China, or Portugal) less frequently express anger by verbally attacking the causer of the emotion, screaming or cursing than people from individualistic, low power distance countries (e.g., USA, France, Germany, or Switzerland).

A second area of divergence across cultures is the typical *causal antecedents* of anger, i.e. the specific circumstances, events, or persons that are likely to elicit the emotion. As a general pattern, in collectivistic societies, there is a proclivity to report anger as an emotion caused by circumstances, rather than by specific people, so as to minimize other people's responsibility for a person's getting angry (Bender et al., 2012). The *social status* of the agents involved in an anger situation is of paramount importance too: while in Western cultural groups, anger is more typically reported to be elicited by someone a person knows or associates with (an 'in-group'), in collectivistic societies, anger is more typically elicited

by strangers (an 'out-group') (Chon, Kim, & Ryoo, 2000; Scherer, Wallbott, & Summerfield, 1986; Stipek, Weiner, & Li, 1989). Cultural variance on the Power Distance dimension provides a further important nuance: in societies with high power distance, experiencing (or at least showing) anger is the least desirable when expressed towards higher-status people. For example, among the Tongans, Ifalukians, or Javanese, there are complex specific social rules to show and maintain respect and obedience to elders; accordingly, disrespect towards (let alone confrontation with) higher-status others is socially condemned (Bender et al., 2012; Lutz, 1988).

Thirdly, differences emerge across cultures with regard to the reported *frequency of experiencing* anger. People in collectivistic societies are reported to less readily acknowledge experiencing anger than those in individualistic societies, possibly due to their perception of anger as a less socially welcome emotional experience. Consequently, collectivistic groups tend to admit to have experienced anger less frequently (Grazzani-Gavazzi & Oatley, 1999).

Finally, variance exists across cultures with regard to the reported *intensity of anger*. Here, in contrast to Western societies, people from collectivistic, larger power distance cultural backgrounds (such as India, Japan, or Mexico) report a lower emotional intensity of other-directed negative emotions. Cross-cultural emotion psychologists relate this tendency to the fact that the explicit display of negative emotions (including those experienced towards social superiors) can bring about retaliation (Matsumoto & Ekman, 1989; Yrizarry, Matsumoto, & Wilson-Cohn, 1998).

Obviously, differences in anger underpinned by Individualism/Collectivism and Power Distance are most pronounced in culturally very disparate populations (e.g., the USA vs. the Ifalukians) – and indeed, prior research has yielded relatively few and weak cross-cultural differences across European cultures (e.g., Scherer et al., 1986). However, several studies have recently demonstrated that cultural variation underpinned by the two dimensions is also observed on a much lower scale, as in two regions of the same country (Mortillaro, Ricci-Bitti, Bellelli, & Galati, 2013) or two sub-cultures within one state (Ogarkova, Prihod'ko, & Zakharova, 2013). Relevant cultural variation has also been reported for the groups considered in the present study: English, Russian, and Spanish speakers from the UK/USA/Australia, Russia, and Spain, respectively. Specifically, Russia and Spain have been reported to be more collectivistic and exhibit a larger degree of power distance (see Ogarkova, Soriano, & Lehr, 2012, for a review), while the UK, USA, and Australia are more individualistic societies characterized by low power distance (Hofstede, 2001). Figure 1 summarizes their corresponding Individualism/Collectivism and Power Distance indexes (Hofstede, 2001).

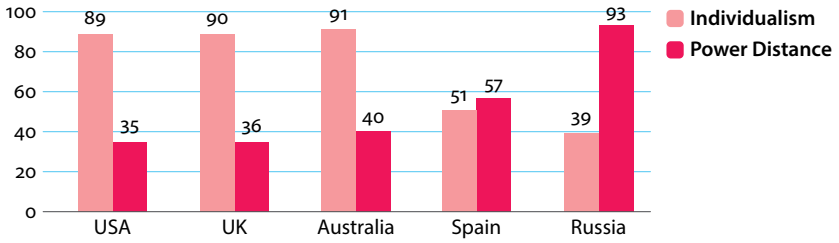

Figure 1. Individualism and Power Distance indexes for the USA, UK, Australia, Spain, and Russia (Hofstede, 2001)

2.1 Research hypotheses

From the literature overview above, several predictions can be formulated concerning the four aspects of variation discussed:

1. *Expression and regulation*. Anger in English will be perceived as (a) less socially disruptive and negative than in Russian and Spanish; therefore, it will be (b) more expressive/outward in its manifestation, and (c) less regulated in English compared to Russian and Spanish.
2. *Causation and social context.* Compared to Russian and Spanish, anger in English will be more likely elicited by (a) other people's actions (as compared to circumstances); (b) social superiors; (c) familiar ('in-group') people.
3. *Frequency.* Experiencing anger will be perceived as more frequent in English compared to Russian and Spanish.
4. *Intensity.* Anger will be perceived as more intense in English when compared to Russian and Spanish.

These hypotheses are tested in three studies with three different methodologies. In what follows, further detail on each of the methods is provided.

3. Methods

3.1 Anger situation-labelling task (Study 1)

Study 1 aimed to assess the convergence of native speakers of the three languages in labelling the same set of anger-eliciting situations.

Materials (anger-eliciting situations)
The labelling task was based on the mapping method (Boster, 2005), a reference-based tactic used to assess (dis)similarities in labelling responses to the same stimuli across different cultural groups. Five anger-eliciting situations (see Annex 1) were constructed using the Facet Approach (Elison, 2005). The basic device of this approach is a *mapping sentence* that contains a set of variables (i.e., *facets*) capturing important components of an emotional situation (e.g., Actors involved, Disadvantaged persons, Actions performed, etc.). Relevant facets of anger situations were derived from the International Survey on Emotion Antecedents And Reactions (ISEAR) database (containing over 3,000 accounts of emotional situations from respondents in 37 countries, see Wallbott & Scherer, 1988) and relevant literature reviews (e.g., Wranik & Scherer, 2010).

Participants
The participants of Study 1 were native speakers of several European languages, among them Russian (N = 17), Spanish (N = 17), and English (N = 11) who took part in the study on a voluntary basis.

Procedure
The participants were asked to free-list the emotion words (nouns, adjectives, or both) in their native language that would best capture the way they would feel in each of those situations. The participants did not know which emotion category was targeted by the scenarios and were free to list whatever emotion term they thought appropriate.

Analyses
For each language sample, the analysis involved grouping and counting the words yielded by each scenario; nouns and adjectives with the same lexical root (e.g., *fury* and *furious*) were grouped together. Global lists including all labels used across situations were also compiled. Then, the absolute frequencies of anger words per language sample and per scenario were converted into relative frequencies (percentages) for further comparison (see Ogarkova et al., 2012, for more detail on the method).

3.2 Feature-based meaning profiles of anger nouns (Study 2)

Study 2 targeted the understanding of the meaning of anger words by native speakers of the three languages.

Materials (feature-rating questionnaire)

The meaning of anger words was assessed using a feature-rating instrument based on the GRID approach (Fontaine, Scherer, & Soriano, 2013). The GRID paradigm predicts that, just like emotional experiences are constituted by variably interrelated changes across several emotion components (e.g., event appraisals, bodily sensations, expressive symptoms, etc.), differences in meaning between the emotion words labelling those experiences can be captured by the same component features.

In this study, the original GRID questionnaire (Fontaine et al., 2013) was modified to specifically address semantic (dis)similarity between words denoting varieties of anger (and several other emotion categories, see Soriano et al., 2013, for further detail). The modified questionnaire comprises questions on 95 features from several emotion components: event appraisal (25), bodily experience (11), facial, vocal, and gestural expression (13), action tendencies (13), subjective feelings (10), and regulation (3). Sixteen more features inquired about various social aspects, such as societal acceptability and frequency.[1]

Twenty-five anger words in the three languages were selected from Study 1 to be rated (see Table 1).

Table 1. Spanish, Russian, and English anger terms elicited in the emotion situation labeling task (Ogarkova et al., 2012) and used in Studies 2 and 3

English	Spanish	Russian
anger*	rabia* [anger]	razdrazhenie* [irritation]
annoyance	enfado [anger/annoyance]	obida* [resentment/hurt]
rage*	indignación* [indignation]	zlost'* [anger]
fury*	cabreo [anger] (colloquial)	gnev* ['justified anger']
frustration*	ira* [anger/wrath]	dosada* [frustration/vexation]
irritation*	molesto [annoyed]	vozmuschenie* [indignation]
indignation*	frustración* [frustration]	negodovanie [indignation]
resentment*	irritación* [irritation]	jarost'* [fury]
	furia* [fury]	serdityj [cross]

Note. Words are listed in descending order of frequency of recall. For readability reasons, Russian terms are transliterated from Cyrillic. Asterisks (*) indicate the words used in Study 3.

1. A complete version of the questionnaire is available at: http://www.affective-sciences.org/node/4244

Participants

Participants were 45 Spanish (9 females; mean age: 22.2, SD = 4.03), 40 Russian (19 females; mean age: 21.2, SD = 2.9), and 36 English-speaking respondents (26 females, mean age: 31.6, SD = 12.7). The sample from Spain comprised university students from several regions in the country; the Russian sample was collected at the University of Volgograd (Russia); for English, university students were recruited at the University of New England (Australia) and Case Western Reserve University (USA).

Procedure

The participants rated anger words in a controlled web-study. Each participant was presented with four to five anger words and was asked to rate the likelihood of each feature for each word on a scale from 1 (extremely unlikely feature) to 9 (extremely likely feature). The order of presentation of words was randomized across the participants. The features were presented on screen one at a time.

Analyses

For each word, the mean rate across the participants was calculated for each feature. This constituted the word's (feature-based) semantic profile. To control for potential cultural differences in scale use (Chen, Lee, & Stevenson, 1995), all mean scores were centred[2] before the analysis (cf. Fontaine et al., 2013). Language-specific differences in the semantic profiles of anger words were investigated using Principal Component Analysis (PCA), a technique to identify the dimensions of greatest variance in a dataset and represent each observation by its coordinates along these dimensions. The 25 anger terms (see Table 1) were treated as observations and the (centred) mean scores of the 95 emotion features as variables.

3.3 Metaphorical construal of ANGER[3] concepts (Study 3)

Study 3 targeted the metaphorical construal of ANGER concepts in English, Russian, and Spanish.

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2. Centring means that for each term the average score was computed across the 95 features in a language sample, and then subtracted from each feature score in that sample.

3. Following the convention in Cognitive Linguistics, small uppercase is used for concepts and conceptual metaphors.

Materials (words and corpora)
Focusing on 20 ANGER nouns (marked with asterisks in Table 1), 20 thousand random KWIC citations (i.e., 1000 per word) were culled from representative corpora in each language: the *British National Corpus*, *Corpus del Español*, and the *Russian National Corpus*. In cases of fewer occurrences of a word in a corpus, additional citations were extracted from supplementary corpora.[4]

Procedure (metaphor extraction and classification)
The methodology used was the 'metaphorical profile' approach, a corpus-based quantitative methodology for metaphor identification, classification, and analysis (Ogarkova & Soriano, 2014a, 2014b; Soriano & Ogarkova, submitted). Metaphorical patterns (Stefanowitsch, 2006) were manually extracted from the citations and classified into conceptual metaphors. To ensure inter-rater reliability, 10% of the English sample was reanalyzed by another rater (Kappa = 0.83, $p < .000$). The general metaphor inventory that emerged at this stage of the analysis (cf. Soriano & Ogarkova, submitted, for details) can be organized in two broad levels. The higher level embraces 'root' metaphors (e.g., ANGER IS A PRESSURIZED FLUID IN THE BODY CONTAINER) heading an interconnected network of sub-metaphors. The sub-metaphors constitute the lower level of the inventory and comprise two types (cf. Soriano, 2005): *entailment* sub-metaphors (e.g., THE VIOLENT EXPRESSION OF ANGER IS AN EXPLOSION/BURST in relation to ANGER IS A PRESSURIZED FLUID IN THE BODY CONTAINER) and *special case* sub-metaphors (e.g., THE EYES ARE A CONTAINER FOR ANGER with regard to its root metaphor THE BODY IS A CONTAINER FOR ANGER).

Furthermore, the metaphors in the inventory were classified into groups according to the semantic foci (cf. Kövecses, 2000) they best instantiate. As suggested by several metaphor scholars (Kövecses, 2000, 2005; Soriano, 2005, 2013), metaphors relevant for the characterization of an emotion concept can form meaningful groups highlighting affective semantic 'dimensions' or 'foci' – such as Intensity, Evaluation (positive/ negative), or Control – that are applicable to a number of other emotions as well. Affective semantic foci are, thus, focal characteristics of emotions profiled by metaphor. They can also be related to common psychological constructs like emotional arousal, valence, or regulation (Soriano, 2013; Soriano & Ogarkova, submitted). Five foci are most relevant for our study:

4. In English, 594 additional KWIC citations were culled from the *Bank of English* for *indignation*. In Spanish, additional contexts of use were sought in the *Corpus de referencia del español actual* (*CREA)* for *furia* (107), *frustración* **(796),** *indignación* (250), and *irritación* (828).

Intensity, Harm/Damage, Expression, Regulation, and Control (see Table 2). To avoid redundancy in the statistical analysis of the data, each metaphor was classified in one group only. Metaphors were classified at the lower level of the inventory as, oftentimes, different sub-metaphors of the same root highlighted different foci. Two metaphors – ANGER IS AN ANIMAL and ANGER IS A VISIBLE/HIDDEN OBJECT – were problematic, as the expressions in them appeared to simultaneously elaborate on several foci. To discriminate between them, we used the notion of 'scenario' (Musolff, 2006). In the metaphor ANGER IS AN ANIMAL, four scenarios were differentiated:

a. Harm-damage (to the self): e.g., *anger eat [emoter's] guts*
b. Harm-damage (to others): e.g., *ferocious anger*
c. Regulation (attempted/successful): e.g., *[emoter] leash (his/her) anger*
d. Regulation (unattempted/failed): e.g., *anger break loose*

In ANGER IS A VISIBLE/HIDDEN OBJECT, metaphorical expressions were split into two scenarios: (a) those highlighting the incidental visibility (or lack of it) of anger, and (b) those implying the voluntary actions of the emoter to make anger perceptible by others:

a. Expression (perceptible): e.g., *see anger, [something] reflect irritation*
b. Control (some): e.g., *[emoter] display irritation, conceal frustration*

In what follows, we will briefly present these foci and their corresponding psychological constructs.

Metaphorically construed ***Intensity*** comes in two varieties in the representation of ANGER: one in which intensity is represented as physiological arousal in terms of heat (as in the metaphors ANGER IS FIRE, ANGER IS A HOT FLUID, and INTENSITY IS HEAT (e.g., *fiery rage*), and another representing emotional intensity more abstractly either in spatial terms (as in the metaphors INTENSITY IS DEPTH and MORE IS UP – e.g., *rage be at peak*), or by referring to volumes and sizes (as in INTENSITY IS THE SIZE OF AN OBJECT/QUANTITY OF A SUBSTANCE – e.g., *enormous frustration*). This semantic focus can be related to the psychological construct of **arousal/activation**, one of the most characteristic features of emotional experiences (Fontaine et al., 2013; Scherer, 2009).

The anger metaphors highlighting ***Harm/Damage*** profile the negative impact of the emotion on the involved agents' physical and mental well-being. This negative impact can be to the self and to others. The former is highlighted by four source domains: ILLNESS, where anger is construed as a disruption of the person's well-being (e.g., *anger fester*); BLINDNESS, which suggests, metaphorically, that anger is impeding normal mental functioning (e.g., *blinding rage*); PRESSURE,

Table 2. Selected semantic dimensions focalized by the different metaphors

Semantic focus	Specification	Conceptual metaphors
Intensity	bodily arousal	ANGER IS FIRE, ANGER IS A HOT FLUID, INTENSITY IS HEAT
	abstract	INTENSITY IS DEPTH, INTENSITY IS A SCALE, INTENSITY IS THE SIZE OF AN OBJECT, INTENSITY IS THE QUANTITY OF A SUBSTANCE, MORE IS UP
Harm/damage (Negativity)	to self	ANGER IS AN ILLNESS, ANGER IS AN ANIMAL[a], THE EFFECT OF ANGER IS PRESSURE ON THE CONTAINER, IRRATIONALITY IS BLINDNESS
	to others	ANGER IS A WEAPON, ANGER IS A DANGER/THREAT, ANGER IS AN ANIMAL[b]
Expression	perceptible	THE EYES ARE CONTAINERS, THE FACE IS A CONTAINER, THE VOICE IS A CONTAINER, ANGER IS LIGHT, ANGER IS SOUND, ANGER IS A MESSAGE, ANGER IS A VISIBLE/HIDDEN OBJECT[a]
	internalized	THE BODY IS A CONTAINER, THE HEART IS A CONTAINER, THE CHEST IS A CONTAINER, THE SOUL IS A CONTAINER, THE HEAD/MIND IS A CONTAINER, INCREASE OF ANGER IS RISE IN THE BODY
Regulation	attempted/successful	ANGER IS COLD, ANGER IS AN OPPONENT, ANGER CONTROL IS CONTAINMENT, FIGHTING THE DESIRE TO ACT IS COUNTER-PRESSURE, ANGER IS AN ANIMAL[c]
	unattempted/failed	ANGER IS INSANITY, THE VIOLENT EXPRESSION OF ANGER IS AN EXPLOSION-BURST, THE NON-VIOLENT EXPRESSION OF ANGER IS THE COMING-OUT OF THE FLUID, THE EMOTER IS AN ANIMAL, ANGER IS AN ANIMAL[d]
Control	some	ANGER IS A TOOL, ANGER IS A MOVED OBJECT, ANGER IS A POSSESSED OBJECT, ANGER IS A VISIBLE/HIDDEN OBJECT[b]
	little/no	ANGER IS A NATURAL FORCE, ANGER IS AN AUTONOMOUSLY MOVING ENTITY, ANGER IS AN ENVIRONMENT, ANGER IS A LOCATION, ANGER IS A CONTAINER, ANGER IS A SUPERIOR

Note. Root metaphors in uppercase; entailment and special-case sub-metaphors in small uppercase; superscript letters ([a, b, c, d]) refer to the specific 'scenarios' within the metaphors.

which profiles a physically unpleasant sensation of swelling or inability to breathe (e.g., *barely breathe for fury*); and ANIMAL (scenario b) where anger is construed as an aggressive creature causing physical damage to the person (e.g., *anger eat X's guts*). Harm/Damage to others encompasses three source domains inviting infer-

ences about the aggressive, punitive responses of anger (Lazarus, 1991): WEAPON, profiling the understanding of anger as a weapon aimed to harm another person (e.g., *X fling indignation at Y*); DANGER/THREAT, emphasizing the (potentially) harmful consequences of anger for third parties (e.g., *Y be scared of X's anger*); and ANGER IS AN ANIMAL (scenario b), highlighting potential aggression of a metaphorical ANIMAL (anger) against others (e.g., *ferocious rage*). *Harm/Damage* as a semantic focus can be related to the psychological construct of **valence** (*negative* valence in this case), a most defining feature of emotional experiences cross-culturally (Fontaine et al., 2013; Scherer, 2009).

Expression is another bipolar semantic focus. The metaphors in one of the poles (perceptible Expression) highlight visible, audible, or otherwise perceptible anger manifestations, while the metaphors in the opposite pole (internalized Expression) profile the lack of external symptoms of the emotion. In the first case, 'external body-parts' (the eyes, face, voice) are construed as metaphorical containers for anger (e.g., *rage be in X's eyes*). The visibility or audibility of anger are also highlighted by the following source domains: SOUND (e.g., *crescendo of indignation*), MESSAGE (e.g., *explain anger*), LIGHT (e.g., *anger flash*), and VISIBLE/HIDDEN OBJECT (scenario a), all of which emphasize the incidental (rather than volitional) visibility of the emotion (e.g., *see anger*). By contrast, metaphorical patterns highlighting internalized Expression construe anger as located inside the person or in 'internal body parts' (literal or imaginary), such as the heart, chest, soul, or head (e.g., *frustration inside X, indignation in heart*). This semantic focus can be related to the psychological construct of emotional **expression**, another major emotion component (Fontaine et al., 2013; Scherer, 2009).

The two remaining metaphor groups can be related to the psychological construct of emotion **regulation**, an important aspect of emotion related to how emotions are perceived by the emoter and how they are acted upon. Both metaphor groups are bipolar. The first one, around the semantic focus of ***Regulation***, has to do with whether the person exerts voluntary control over the existence, intensity, or expression of the emotion. In the first pole, regulation is successful or at least attempted; in the second, it is either unsuccessful or unattempted. The source domains in the first pole include OPPONENT (e.g., *X wrestle with X's rage*), COUNTERPRESSURE (e.g., *suppress fury*), CONTAINMENT (e.g., *bottle up frustration*), ANIMAL (scenario c) (e.g., *bridled fury*), and COLDNESS, where "cold anger" refers to "controlled anger" (e.g., *anger glitters coldly in X's eyes*). The metaphors in the opposite pole refer to anger COMING OUT (e.g., *anger spill out*), causing an EXPLOSION (e.g., *explode with anger*), being INSANITY (e.g., *X get mad with frustration*), being an uncontrolled ANIMAL (scenario d) (e.g., *wild fury*) or to the EMOTER AS AN ANIMAL (e.g., *X bellow with fury*).

The last group of metaphors focuses on the notion of ***Control***, i.e., whether the person feels s/he has any power over his/her anger. This bipolar focus embraces two types of source domains. One subgroup highlights the relative control the person has over his/her emotional state; here, anger is construed as a physical object the person can manipulate. The relevant source domains are POSSESSION (e.g., *harbour resentment*), MOVED OBJECT (e.g., *bring rage*), and VISIBLE/HIDDEN OBJECT (scenario b), where the angry person can at will either show or disguise the felt emotion (e.g., *display irritation, conceal frustration*). The opposite pole is occupied by metaphors profiling little or no control, where anger is construed as a LOCATION or CONTAINER surrounding the person on all sides (e.g., *into irritation*), a NATURAL FORCE (e.g., *avalanche of fury*), an autonomously MOVING ENTITY (e.g., *fury return*), or a CONTROLLER/SUPERIOR (e.g., *at the mercy of resentment*).

Analyses

First, the total number of metaphorical patterns per focus was counted for each of the 20 words. The frequencies for each translation pair (8 Russian-English and 7 English-Spanish pairs) were then submitted to a series of Fisher exact tests. As this involved multiple testing, the levels of significance were adjusted using Bonferroni correction (i.e. they were divided by 10, the number of tested semantic foci).

4. Results

4.1 Word use in the anger situation-labelling task

Differences in labelling anger situations emerged at two levels: in the most frequent words overall (see Figure 2) and in the specific labelling choices for individual situations. Regarding the former, while the most frequent English term was *anger/angry* (10.8% of all responses), in Russian, the top most frequent term was *razdrazhenie* ('irritation') (13.2%), signalling a lower intensity type of emotion (cf. Ogarkova et al., 2012, p. 274). The second most frequent Russian term, *obida* ('resentment/hurt') (7,1%), also refers to a less expressive, more internalized variety of the emotion than English *anger*. In Spanish, the most frequent anger term overall was *rabia* ('anger'), but the word *impotencia* ('impotence') was used just as frequently (9.8%). *Impotencia* is likely to refer to the person's inability to correct the anger situation and/or to exert retaliation, and its frequency in Spanish suggests the importance of a culturally-mediated need to regulate the emotion (cf. Soriano, 2013, for converging evidence).

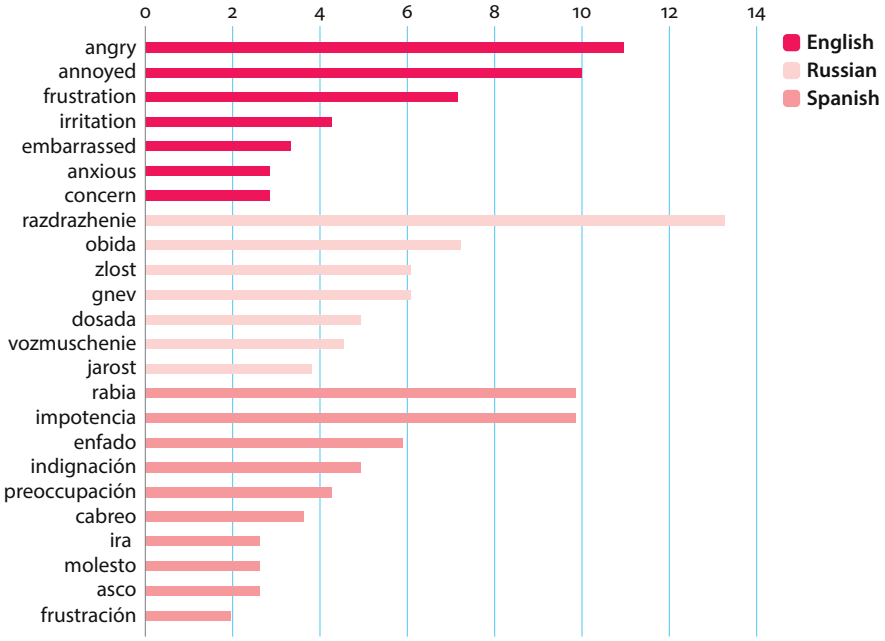

Figure 2. Most frequent labels used across all anger situations by English, Russian, and Spanish respondents (% of the total word use across all scenarios)

Regarding differences in word use in labelling individual situations, two scenarios were particularly revealing: situation I, where the offender was a social superior, and situation V, where the offender was an 'in-group' person (a colleague) (see Annex I). In contrast to English where the most frequent response was *anger/angry* (situations I & V) and *insulted* (situation V), Russian and Spanish respondents opted for words referring to less aroused, more internalized, or non-retaliating forms anger.

Specifically, in Russian, the typical responses to the offence by a social superior and an 'in-group' person were *obida* ('hurt/resentment') and r*azdrazhenie* ('irritation'), respectively (Figures 3–4). In Spanish, an offence by a social superior most frequently elicited *rabia* ('anger'), followed by *impotencia* ('impotence'); the most common emotion experienced towards an in-group member was *enfado* ('anger-annoyance') (Figures 3–4).

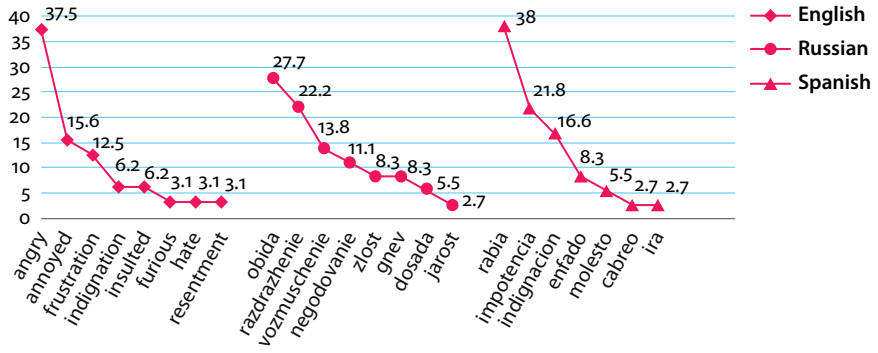

Figure 3. Label use in scenario I (% of the total word use in the situation)

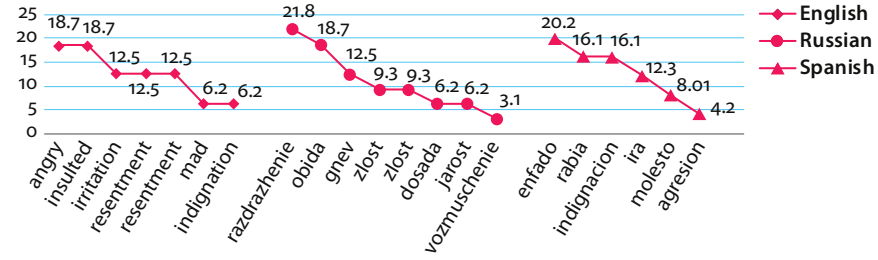

Figure 4. Label use in scenario V (% of the total word use in the situation)

4.2 Differences in the feature-based profiles of anger nouns

A two-dimensional solution of the PCA accounting for 49.2% of the total variance was selected on the basis of the scree plots and the interpretability of the emerging dimensions. Dimensions 1 and 2 accounted for 30.1% and 19.1% of the total variance, respectively.

Dimension 1 (Figure 5, vertical axis) was easily interpretable as a Power-Arousal dimension opposing, in all three languages alike, the least aroused and virulent anger subtypes, like English *annoyed* and *resentment,* Russian *dosada* ('vexation') and *obida* ('resentment'), or Spanish *frustración* ('frustration') and *molesto* ('annoyed), to the anger varieties that imply a higher degree of arousal and virulence, such as English *rage* and *furious*, Russian *jarost'* ('fury') and *gnev* ('justified anger'), and Spanish *ira* ('anger/wrath') (see Soriano et al., 2013, for congruent results). A subsequent analysis of variance (ANOVA) of the loadings for the various anger terms on Dimension 1 did not show significant differences across the languages ($F\ (2,\ 22) = 0.72$, $p = .931$), suggesting that the differentiation of anger types according to their power and arousal is equally salient in the three languages.

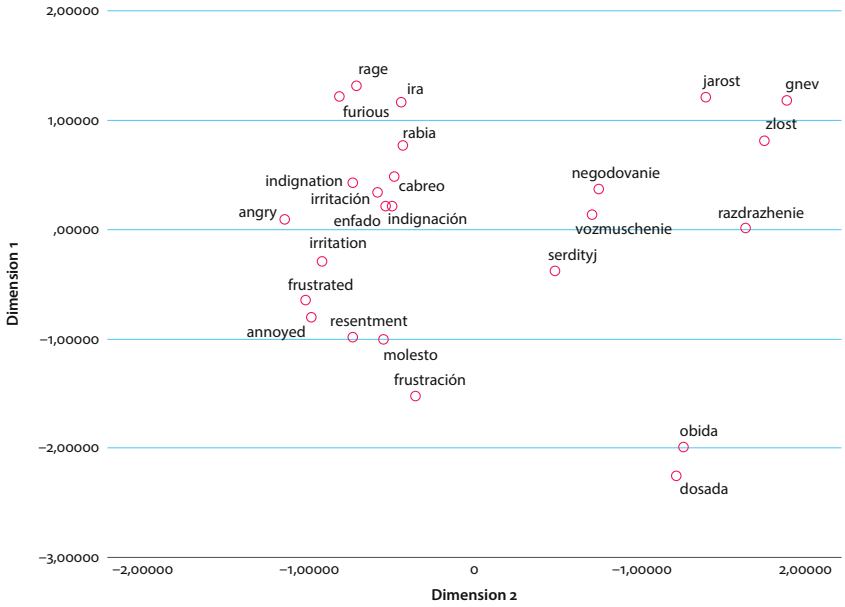

Figure 5. Two-dimensional solution (PCA) based on the feature-based profiles of anger terms in English, Russian, and Spanish

By contrast, significant languages differences (ANOVA, $F(2,22) = 111.13$, $p < .000$) were found for the loadings of anger terms on Dimension 2 (Figure 5, horizontal axis). Subsequent posthoc Sidak tests demonstrated a significant difference between Russian and both English and Spanish ($p < .000$ in both cases). Spanish and English differed marginally significantly as well ($p = 0.54$).

An analysis of the highest loading features (Table 3) reveals the nature of this dimension. On one pole, we find features highlighting the frequent and open manifestation of anger (#87, 86) and its social acceptability (# 88), reflected also in the likelihood of attributing the emotion to both others and oneself (# 94, 95) and its ubiquitous character, since it can be experienced towards all types of wrongdoers regardless of their social status (#83, 84, 85) and in all social situations, regardless of whether one is with others or alone (#90, 91). The emotions at this end of the spectrum are also perceived to be intense (#82). Finally, the features indicate that these types of anger are caused by specific and intentional actions of others (#54, 44). Taken together, these features capture a view of anger as an openly manifested, socially acceptable, frequent, and intense emotion elicited by the intentional actions of others. All of the English anger words are closer to this characterization than the Russian and Spanish words.

Table 3. Rating features with highest loadings on Dimension 2

#	Features	Score
95	the emotion is attributed by people in your society to others	−0,898
87	the emotion is frequently openly manifested in your society	−0,751
90	the emotion is experienced individually	−0,734
83	the emotion is experienced towards someone who is equal in social status	−0,733
93	the emotion happens when the person is alone	−0,729
92	the emotion happens when other people are present	−0,726
84	the emotion is experienced towards someone who is inferior in social status	−0,724
85	the emotion is experienced towards a superior/someone with a higher social status	−0,72
44	the person wanted to blame others	−0,702
91	the emotion is experienced together with other people	−0,694
86	the emotion is frequently experienced in your society	−0,694
54	the emotion was caused intentionally	−0,694
2	the person felt bad	−0,686
13	the person felt warm	−0,682
94	the emotion is attributed by people in your society to themselves	−0,623
82	the emotion is an intense emotional state	−0,553
88	the emotion is highly acceptable in your society as to actually experiencing it	−0,396
25	the person frowned	−0,316
39	the person wanted to do some harm to her/himself	−0,175
55	the emotion was caused by the person's behavior	−0,083
67	the emotion was caused because of the material possessions of a stranger	−0,005
53	the emotion could have been expected by the person	0,193
68	the emotion was caused by circumstances/ things beyond any human control	0,439
56	the emotion was caused by an intrinsic quality of the person her/himself	0,47
6	the person felt restless	0,53
74	the emotion had an impact on the person's reputation	0,554
16	the person got pale	0,578
11	the person blushed	0,58
60	the emotion was caused by someone who is inferior in social status	0,609
48	the person wanted to be close to people or things	0,641
49	the person wanted to sing and dance	0,682
61	the emotion was caused by someone who is superior, or higher in social status	0,683
21	the person trembled, or felt shivers	0,699
1	the person felt good	0,7
24	the person smiled	0,757
46	the person wanted to deny what was happening	0,788
59	the emotion was caused by someone who is equal in social status	0,848
57	the emotion was caused because of the person's material possessions	0,928

Note. Score = loading of a rating feature on Dimension 2 (Principal Component Analysis with Varimax rotation)

On the opposite pole of the dimension, anger is characterized above all in reference to causation. The highest loading features speak of the social status of the wrongdoer (#59, 60, 61) and different types of causes of anger, such as material possessions or intrinsic qualities of the experiencer him/herself (#56, 57). In contrast to the opposite pole, the emotions at this end of the spectrum are perceived as more likely caused by circumstances beyond human control (#68) than by intentional actions. Taken together, the features describe a type of anger that is not defined by its manifestation, but rather by its causation profile and where social considerations and circumstances (rather than actions) are given greater consideration. All of the Russian anger words are significantly closer to this characterization of anger than the English and Spanish words.

Interestingly, the terms that differed most on Dimension 2 in the three languages were the prototypical anger words: English *anger*, Russian *zlost* ('anger') and *gnev* ('justified anger') and Spanish *rabia* ('anger') and *ira* ('anger/wrath') (see Table 4).

Table 4. Differences in loadings on Dimension 2 between translation pairs (English *vs* Russian/Spanish)

English vs Russian	Dif.	English vs Spanish	Dif.
anger–gnev	2,97	anger–rabia	0,72
anger–zlost'	2,84	anger–ira	0,71
irritation–razdrazhenie	2,53	frustrated–frustración	0,67
frustration–dosada	2,24	annoyed–enfado	0,45
furious–jarost'	2,18	irritation–irritación	0,35
rage–jarost'	2,08	indignation–indignación	0,25
resentment–obida	2,00		
indignation–negodovanie	1,45		
indignation–vozmuschenie	1,42		

4.3 Differences in the metaphorical profiles of anger nouns

The statistically significant differences in the exploitation of the foci for each pair of translation equivalent terms in English vs. Russian and English vs. Spanish are summarized in Table 5.

Not all translation pairs were significantly different on all semantic foci. The number of differences observed for each translation pair is shown in Table 6.

The highest number of differences is observed for the Russian and Spanish prototypical anger varieties (*zlost', gnev, rabia, ira*) compared to English *anger* (and for the contrast *fury-furia* in English and Spanish); the least variation occurs among irritation and indignation lexemes.

Table 5. English vs Russian/Spanish translation pairs that differ significantly in the number of metaphorical patterns in the semantic foci

Semantic focus	Specification	Russian/Spanish		English	p
Harm	to self	zlost	>	anger	2.3e-8***
		gnev	>	anger	7.8e-8***
		ira	>	anger	3.3e-9***
		rabia	>	anger	2.3e-11***
		vozmuschenie	>	indignacion	8.5e-7***
		jarost	>	fury	9.7e-13***
		furia	>	fury	2.1e-6***
	to others	gnev	>	anger	1.3e-6***
		furia	>	fury	6.06e-9***
		furia	>	rage	9.8e-9***
Intensity	bodily arousal (heat)	rabia	<	anger	9.2e-4**
		frustración	<	frustration	1.8e-5***
		indignación	<	indignation	5.9e-5***
		furia	<	fury	4.0e-4**
	abstract	zlost	<	anger	0.002*
		gnev	<	anger	5.0e-5***
		ira	<	anger	5.9e-5***
		dosada	<	frustration	0.001*
Expression	perceptible	rabia	<	anger	1.8e-5***
		jarost	<	fury	2.5e-5***
		furia	<	fury	0.002*
	internalized	irritación	>	irritation	0.004*
Regulation	attempted/successful	obida	>	resentment	0.004*
	unattempted failed	dosada	<	frustration	0.004*
		frustración	<	frustration	4.9e-4**
		jarost	<	rage	2.1e-4**
		furia	<	rage	1.6e-6***
Control	some control	gnev	>	anger	5.1e-4**
		rabia	>	anger	1.8e-16***
		indignación	>	indignation	0.001**
	little/no control	zlost	<	anger	2.5e-6***
		rabia	<	anger	1.5e-7***
		furia	<	fury	2.2e-6***
		furia	<	rage	5.3e-8***

Note. Fisher exact. Asterisks */ **/*** indicate p<0.05/0.01/0.001 (corrected); < / > indicate the direction of effect (less/more patterns than).

Table 6. Number of foci where significant differences in the English *vs* Russian/Spanish translation pairs were observed

English vs Russian	N	English vs Spanish	N
anger–gnev	4	anger–rabia	5
anger–zlost	3	fury–furia	5
frustration–dosada	2	anger–ira	3
fury–jarost	2	frustration–frustración	3
indignation–vozmuschenie	1	rage–furia	3
rage–jarost	1	indignation–indignación	2
resentment–obida	1	irritation–irritación	1
irritation–razdrazhenie	0		

5. Summary and discussion

In this section, we summarize the findings in Studies 1–3 and discuss how they support the hypotheses formulated in Section 2.1. Taken together, the results of **Study 1** provide supporting evidence on five of the explored predictions (Table 7), namely, on the generally more expressive and less regulated nature of anger in English compared to Russian and Spanish (predictions 1 b–c); on the higher likelihood of experiencing and manifesting anger towards social superiors and in-group persons in English as compared to Russian and Spanish (predictions 2 b–c), and on the higher intensity of anger in English compared to Russian and Spanish (prediction 4).

Five of the tested hypotheses are also supported by the findings in **Study 2** (Table 7). First, anger is perceived as a more socially acceptable emotion in English compared to Russian (prediction 1a), which results in its more expressive and frequent manifestation and experience (predictions 1b and 3). Furthermore, anger is more likely caused by intentional actions (vs. circumstances) (prediction 2a) and refers to a more intense experience (prediction 4) in English compared to Russian.

The contrast English *vs.* Spanish yielded only marginal statistical significance, but the placement of the Spanish words between the English and the Russian ones on Dimension 2 is informative nevertheless, since the continuum across these three languages suggested by our analyses matches the continuum of cultural variance on Individualism/Collectivism and Power Distance identified for the respective societies in previous psychological work (see Figure 1 in Section 2).

Our finding that the most divergent anger terms on Dimension 2 in the three languages were the prototypical anger words is particularly interesting. Assuming that these terms best represent the 'average' anger experience in each language,

their divergence corroborates the claim that English and Russian (and Spanish, to a lesser extent) indeed differ importantly in the kind of information profiled by their emotion words. An additional nuance suggested by our results is that indignation words (English *indignation,* Spanish *indignación,* Russian *negodovanie* and *vozmuschenie*) differed the least, suggesting that the codification of morally justified types of anger may be more similar across languages.

The results of **Study 3** speak in favor of four predictions explored in the present study (Table 7). First, metaphors emphasizing negativity are more saliently represented in Russian and Spanish than in English (prediction 1a), both with regard to harm to the self and to others. Second, metaphors emphasizing the intensity of the emotion, be it construed via references to heat (e.g., *simmering resentment*) or more abstractly (e.g., *anger reach a high*) are more frequent for English words than for their correlates in the other two languages (prediction 4). Third, English words appear to more robustly highlight the expressivity/visibility of anger and less frequently occurred in metaphorical expressions highlighting an internalized experience of the emotion (prediction 1b). Finally, the metaphors highlighting successful or at least attempted emotion regulation are more salient in the metaphorical representation of anger in Russian and Spanish, while unattempted or failed regulation patterns are more prominent in English (prediction 1c).

An additional nuance offered by our metaphor analysis is that the Russian and Spanish words exhibit a stronger association with source domains highlighting the intrinsic controllability of the emotions, while the reverse pattern (no control) is more typical of the English anger varieties (see Table 5 in Section 4.3).

Our finding that the highest number of differences between Russian/Spanish and English is observed for the prototypical anger terms is strikingly similar to our results in Study 2 and the same interpretation applies: if the prototypical anger words are taken to embody the average anger experience in the respective cultural groups, their more prominent divergence underscores the global differences in the general representation of anger in the three languages.

Table 7. Summary of findings in Studies 1–3 supporting the predictions

Area	Prediction	Study 1	Study 2	Study 3
1. Expression and regulation	a. negativity		+	+
	b. expression	+	+	+
	c. regulation	+		+
2. Causation antecedents and social context	a. actions vs. circumstances		+	
	b. social superior	+		
	c. in-group member	+		
3. Frequency			+	
4. Intensity		+	+	+

Taken together, the three methods provide convergent evidence in support of all formulated predictions. Two of them – on intensity and manifestation of anger – are supported by all three methodologies, suggesting that emotion intensity and its expressive symptoms are particularly salient characteristics of anger that permeate language and are, thus, easier to capture in both observation and elicitation-based data.

6. Conclusions

This paper explored the value of Conceptual Metaphor Theory in the interdisciplinary study of emotion. The insights provided by a quantitative, corpus-based analysis of anger metaphors in three languages (English, Spanish, Russian) were compared to those stemming from two other psycholinguistic methodologies: a feature-rating and a labelling task. The three methodologies were used to independently test in language several hypotheses on cross-cultural differences in anger experiences derived from earlier findings in emotion psychology. Specific patterns of divergence were predicted with regard to four aspects: (1) the general evaluation, expression, and regulation of anger; (2) the causal antecedents and social status of the offender in anger scenarios; (3) the perceived frequency of anger occurrence in society; and (4) the perceived intensity of the emotion.

The results of Studies 1–3 provide convergent evidence in support of all formulated predictions. Additionally, CMT is shown to be on a par with other language-based methods for conceptual analysis, providing reliable and replicable results that make sense in a wider research context. Specifically, the distributions of node words in metaphorical contexts in the three languages are shown to cohere with previously observed patterns of cross-cultural variation in the respective cultural groups.

However, the results yielded by the three language studies go beyond the mere replication of regularities previously observed in emotion psychology, as each method provides further insight, for example, by revealing the salience of powerlessness in the representation of anger in Spanish (Study 1), or by demonstrating that cultural variation is most prominent among the prototypical anger concepts of a language and less pronounced in other anger varieties, such as indignation (Studies 2–3). The metaphor data specifically also reveal the relevance of controllability in the characterization of the emotion and its variability within and across languages, suggesting the need for a greater granularity in the investigation of the emotion, and the desirability of including features about *controllability* in psychological rating instruments. This notion of "controllability" profiled by metaphor complements the more psychological construct of emotion regulation,

encouraging emotion researchers in any discipline to look not only into the specific "display rules" (Matsumoto et al., 2010) sanctioned by a culture to express emotion, but also into the perceived intrinsic controllability of this experience and its cross-cultural variability.

Compared to the other two methodologies, metaphor research exhibits some limitations too: emotion metaphors do not straightforwardly inform us about the social contexts where emotions occur, their typical antecedent events, or how frequently an emotion is experienced in a community. For that reason, future metaphor-based semantic profiling studies should ideally be complemented with other profiling methods in Cognitive Linguistics (cf. e.g., Krawczak, 2014) where these aspects of emotional experiences can also be annotated and statistically analyzed.

Notwithstanding the above limitations, the present study has demonstrated that CMT-based analyses can be a viable addition to the current repertoire of quantitative language-based methods in the interdisciplinary study of emotion. For this to be true, though, several methodological and analytical adaptations are desirable. First, our results speak in favour of a *quantitative, bottom-up perspective* on emotion metaphor where the degree of exploitation of a source domain is used as a measure of the saliency of the emotion characteristics profiled by that domain. In our case, it is precisely at the quantitative level that emotion metaphors were found to differ across the three languages. Second, our results emphasize the advantage of focusing on *several varieties of the same emotion* (rather than prototypical labels representing the entire domain). In our study, this modification added nuance to the characterization of the domain across languages by allowing us to determine which anger variants were most or least dissimilar on each of the investigated facets. Thirdly and finally, our study demonstrates that CMT-based research would benefit from *relating metaphorical source domains* (or rather, the main aspects profiled by them) *to established constructs* in emotion psychology. The classification of anger metaphors into 'semantic foci' allows us to make a first step towards a more fruitful dialogue between the two disciplines.

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Annex 1. ANGER-eliciting scenarios (Study 1)

Which words in your native language would you use to name the emotion(s) you would feel if you were in this situation? Write down several nouns (e.g., *fear*) and/or adjectives (e.g., *scared*) that would capture the nature of your feeling.

#	**Situation**
I	Although I had been working extremely hard for the last couple of months, my boss blamed me, in front of other people, for neglecting some tasks at work. In fact, the tasks in question were not supposed to be done by me.
II	My neighbours are in the habit of cooking terribly smelly food when I come home at night.
III	We sent our young son to a private school abroad; recently, in a phone conversation we learnt that he was being bullied by some of his older classmates.
IV	My computer crashed and I was not able to finish the work and meet a crucial deadline.
V	A colleague told very unpleasant, dirty jokes about 'the national character' of my countrymen at a party I attended and where everyone knew my nationality.

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