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In the warmth of the Ukrainian temperature domain*

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This paper aims to outline the temperature domain as it is lexicalised in the Ukrainian language. The temperature domain will be considered in relation to the semantic and morphosyntactic features of temperature terms, their collocational patterns as well as their semantic extensions. This analysis is carried out from the perspective of a Ukrainian world view. It also seeks to address the gradability of temperature intensity which is variably realised across the temperature domain. On the one hand, this variation is rooted in the phenomenological nature of temperature, which is conceptualised via different frames of reference; on the other, it is evaluated diversely as defined by socio-cultural norms.

Introduction

Temperature is a basic domain of human experience (Langacker 1987:149) and, in relative terms, "its linguistic representations are quite limited – far more limited than, say, basic color terms" (Plank 2003: 5). However, variation in the lexicalisation patterns of temperature concepts, incongruities in their morphosyntactic properties and the richness of their semantic extensions, both within the temperature domain and across other domains of experience in different languages, call for a thorough, systematic and comparative investigation of temperature expression. This investigation should be considered within single natural languages and cross-linguistically against broader linguistic as well as cultural and climatic backgrounds.

The present paper aims to investigate how the Ukrainian language realises temperature terms with respect to their semantic structure, their lexico-grammatical make-up and their semantic extensions. It also addresses the issue of a relationship between the conceptual structure of the temperature domain and the inclusive or restrictive behaviour of temperature expressions in Ukrainian. In particular, the paper seeks to find out if the Ukrainian system of temperature terms has a lexical and morphosyntactic core; whether Ukrainian temperature terms symmetrically express temperature value and temperature evaluation with respect to word classes and the distribution of syntactic patterns, and whether temperature properties of some entities evaluated are more finely graded than others.

The theoretical framework of this analysis rests on the premise that languages – both internally and cross-linguistically – variably express temperature concepts by lexical and /or morphosyntactic means based in three main dimensions: kinds (sub-domains) of temperature evaluation, temperature value and entities evaluated (Koptjevskaja-Tamm 2011: 393). In broader terms, it seems promising to take into account "an embodied and experiential view of linguistic meaning" (Hampe 2005: v) in research on the linguistic expression of temperature perception. A linguistic case study of temperature expressions suggests variation of schematic representations of thermal experience in the conceptual structure of a temperature domain. The paper adapts a socio-cultural context-bound angle of image schema theory (see Kimmel 2005 for references) to interpret conceptual differences among the temperature sub-domains actualised in Ukrainian.

Section 1 includes background information about the location of Ukrainian speakers, the local climatic conditions of Ukraine, and a brief morphosyntactic overview of the Ukrainian language. The methodology adopted in the study is also described.

Section 2 mainly focuses on basic temperature terms in Ukrainian, as defined by Taylor (1995: 49) and Plank (2003: 1), their distribution across word classes, their corpus frequencies as well as variations in the expression of intensity for the quality concerned.

Section 3 addresses the kinds of temperature evaluation and entities evaluated with respect to their temperature values as they are conceptualised and expressed in the Ukrainian language. Distinctions in the semantic structure of Ukrainian temperature terms and some typical syntactic constructions in which they are used to express various temperature experiences are also considered.

Section 4 outlines semantic extensions of Ukrainian temperature terms which are often motivated by metaphor and metonymy. A brief discussion of the conceptual structure underlying the Ukrainian temperature domain and concluding remarks follow.

1. Background information

For a more complete picture of the linguistics of temperature in Ukrainian, a broader sociolinguistic (1.1), climatic (1.2) and morphosyntactic (1.3) background needs to be delineated. Data collection and methodology are described in (1.4)

1.1 Language location and speakers

Ukrainian is a Slavic (also known as Slavonic) language in the Indo-European family and is traditionally grouped together with Belarusian and Russian into the East Slavic sub-group. Ukrainian is the state language of Ukraine, the second-largest country in Europe (The World Factbook 2011),[1] and it is one of the official languages in the breakaway Moldovan Republic of Transdnistria (Constitution of the Pridnestrovian Moldavian Republic 2000).[2] It is also spoken in ethnic Ukrainian communities in neighbouring Belarus, Poland, Slovakia, Hungary, Romania and Russia as well as in immigrant communities in other former USSR republics, Western Europe and overseas including Canada, the USA, Argentina and Australia, to name a few. The majority of ethnic Ukrainians reside in Ukraine, namely over thirty-seven million or almost 78% of the whole nation's population, according to the 2001 National Census.[3] Some 12 to 20 million ethnic Ukrainians are scattered worldwide.[4, 5] Statistics from the 2001 census show that 67.5% of all Ukrainian residents consider Ukrainian as their mother tongue and the vast majority of other Ukrainian residents have a command of Ukrainian. However, it is rather difficult to accurately estimate the number of Ukrainian speakers abroad.

1.2 Climatic conditions

Ukraine lies in a temperate climatic zone influenced by moderately warm, humid air from the Atlantic Ocean, although a more Mediterranean climate is found on the

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1. Central Intelligence Agency. ⟨https://www.cia.gov/library/publications/the-world-factbook/index.html⟩ (30 January 2011).

2. Supreme Council of the Pridnestrovian Moldavian Republic. ⟨http://vspmr.org/?Part=216&Lang=Eng⟩ (15 December 2010).

3. State Statistics Committee of Ukraine 2001 ⟨http://2001.ukrcensus.gov.ua⟩ (15 December 2010).

4. Ministry of Foreign Affairs of Ukraine ⟨http://mfa.gov.ua/ua/about-ukraine/ukrainians-abroad⟩ (1 July 2012).

5. Ukrainian World Congress ⟨http://www.ukrainianworldcongress.org/About_the_UWC_en_259cms.htm⟩ (10 January 2011).

southern Crimean coast. Winters vary from being cool along the Black Sea in the south to cold farther inland. In summer, on the other hand, the southeast experiences higher temperatures than the rest of the country. The absolute maximum on record is +41°C and the absolute minimum is −42°C. Precipitation is distributed unevenly, with the highest falls in the west and north and the lowest rainfall in the east and southeast of the country (Fourman 2001; The World Factbook 2011).

Due to the climatic conditions, four seasons – spring, summer, autumn and winter are clearly distinguished in Ukraine (Fourman 2001). However, only two seasons, *xolodna pora roku* 'cold time of the year' and *tepla pora roku* 'warm time of the year', were recognised in the distant past (Kravtsiv 1984).

1.3   A brief morphosyntactic overview of the Ukrainian language

The spoken and written traditions of the Ukrainian language developed somewhat separately for centuries due to socio-historical factors (Pugh & Press 1999: xiii–xiv; Sussex & Cubberley 2006: 84–87). The modern language has two literary norms, Central Ukrainian and Western Ukrainian, both using the same version of the Cyrillic alphabet, as well as numerous dialects. These noticeably vary in the sound system, lexicon and "non-standard grammatical features, some of which are archaisms or descendants of old forms since discarded by the literary language" (Young 2006: 212).

Like other Slavic languages, Ukrainian has a rich morphology including a rich inflectional morphology, which is "primarily fusional, that is a given affix frequently combines the expression of a number of grammatical categories" (Comrie & Corbett 2002: 6), as in (1).

(1)   *tepl-a   zemlja*
       warm-F.NOM.SG soil:F.NOM.SG[6]
       'warm soil'

Typical of European languages, there is a division into open word classes including nouns, verbs, adjectives and adverbs, and closed word classes including auxiliaries, determiners, pronouns, prepositions, conjunctions and interjections (Sussex & Cubberley 2006: 310). The nominal declension has seven grammatical

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6. List of abbreviations used in the paper: 1 – first person, 3 – third person, ACC – accusative, ADJ – adjective, ADV – adverb, CMPR – comparative, CNJ – conjunction, DAT – dative, DIM – diminutive, F – feminine, GEN – genitive, INF – infinitive, INS – instrumental, IPFV – imperfective, LOC – locative, M – masculine, MAN – manner, N – neuter, NEG – negation, NOM – nominative, PASS – passive, PFV – perfective, PL – plural, PRED – predicative, PREP – preposition, PRS – present, PST – past, SG – singular

cases (nominative, genitive, dative, accusative, instrumental, locative, and vocative), two numbers (singular and plural) and three genders (masculine, feminine and neuter).

Adjectives agree with the noun they modify in case, number and gender, with their citation form being nominative masculine singular. Most adverbs of manner are derived from adjectives by replacing the adjectival inflexion, usually with -*o* and less commonly with -*e*. These occur as regular correspondences of adjectives in predicative functions.

Within the verbal system, participles are no longer productive but they have been preserved in the language as adjectives.

As with other Slavic languages (Sussex & Cubberley 2006: 309), Ukrainian shows less variation in its syntactic structures than in its morphology. However, word order is quite flexible, when it is not restricted by the absence of other markers of syntactic relations or stylistic features. The grammatical subject may not be present in indefinite-personal and impersonal constructions as well as ellipsis.

Regarding language variation and language contact, "the principal transition features are to Belarusian in the north-west, to Russian in the north-east and east, and to Polish in the west, with less extensive transitions to Slovak" (Sussex & Cubberley 2006: 517–518). Overall, Ukrainian is closest to Belarusian.

1.4   Data collection and methodology

Predominantly descriptive in its nature, this paper examines the semantic properties of Ukrainian temperature terms and patterns of their linguistic behaviour via collocability in a variety of contexts. In this regard, it closely follows the temperature questionnaire devised by Koptjevskaja-Tamm (2007). The scope of analysis is restricted to the expression of states and properties related to temperature perception, with inchoatives and causatives being out of focus. Also, such elementary image schemas[7] as SCALE, CONTAINER, SURFACE, PART-WHOLE, UP-DOWN and CENTER-PERIPHERY are used as analytical tools to capture conceptual similarities and differences among the sub-domains, which might underlie the internal heterogeneity of the linguistic temperature domain.

All temperature contexts for this study come from an electronic corpus and various lexicographic sources selectively listed in footnotes. A continually updated test

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7.   Broadly, image schemas are thought of as basic cognitive forms of an inherently embodied nature that emerge from kinesthetic, spatial and sensory experiences (Lakoff 1987: 267–275; Kimmel 2005: 297, 303).

version of the first open Ukrainian Texts Corpus (KTUM)[8] served as a general data-base. At the time when this research was run, KTUM was a 4.5 million word token collection of written and spoken language representing both fiction and non-fiction discourse largely over the last fifty years. Because of KTUM's technical limitations, all relevant KWIC[9] hits were saved as.txt files and queried via the AntConc 3.2.1 concordance program[10] for raw frequencies and the collocability of temperature terms. Also, the electronic version of the Comprehensive Dictionary of the Contemporary Ukrainian Language (VTS)[11] with about 250,000 words and phrases on record was used as a database to semi-automatically analyse the spread of temperature terms in dictionary explanations as an indication of their centrality.

The first step of the research included the identification of native temperature stems in the Ukrainian language and their word-class distribution with respect to temperature value. Second, temperature terms were classified according to their centrality (basicness) in the domain following the criteria specified by Taylor (1995: 49) and Plank (2003: 1). Third, frequencies and collocability of selected temperature terms were accounted for in the text corpus. Fourth, common syntactic and lexical contexts of selected temperature terms in the sub-domains of ambient, touch and personal-feeling temperature were semi-automatically and manually identified and analysed in more detail. Fifth, semantic extensions of temperature terms were exposed. Last, image schemas suggestively underlying the temperature sub-domains were identified based on all the data available.

2. The temperature system in Ukrainian

This section will focus on how temperature intensity is lexicalised in Ukrainian (2.1) and how temperature terms are arranged in the Ukrainian temperature domain depending on the degree of their centrality (2.2).

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8. Darčuk, Natalja P., Viktor M. Sorokin, Olena B. Siruk, Yaryna V. Xodakivs'ka, Natalja H. Čejlytko, and Marharyta O. Lanhenbax. *Testova versija korpusu tekstiv ukrajins'koji movy* [A Test Version of the Ukrainian Texts Corpus]. Kyiv: Ševčenko National University. ⟨http://www.mova.info/corpus.aspx?l1=209⟩ (26 January 2011). As of October 2014, the corpus consisted of 13 million tokens.

9. "Key Word In Context" is a simple concordance format in an electronic corpus, with the search (node) word centred in each line of context on the screen.

10. Anthony, Laurence. AntConc (Version 3.2.1) [Computer software]. Tokyo, Japan: Waseda University. ⟨http://www.antlab.sci.waseda.ac.jp/software.html⟩ (30 January 2011).

11. ABBYY. 2005. *Velykyj tlumačnyj slovnyk sučasnoji ukrajins'koji movy* [Comprehensive Dictionary of the Contemporary Ukrainian Language]. CD-ROM, Electronic version ABBYY Lingvo 12 Multilingual. Kyiv: Perun.

2.1   Lexicalisation of temperature intensity

Arguably, the intensity of temperature is the pivotal dimension of thermal perception. Hence the conceptual domain of temperature is essentially gradable. However, the intensity of temperature is asymmetrically expressed by both lexical and morphological means.

First, Ukrainian employs three basic temperature stems **xolod-** 'cold', **tepl-** 'warm' and **harjač-** 'hot', with several other stems mostly pointing to either extreme or in-between temperatures (see Table 1). Ukrainian terms for cooling, neutral and warming temperatures are lexicalised as nouns, adjectives, adverbs and verbs; however, the word class distribution is also asymmetrical with respect to different temperature related stems (Table 1).

Table 1. Temperature related stems across word classes

	cooling							neutral		warming					
	stuž- 'bitter_cold'	*merz-* 'freeze; feel cold'**	*moroz-* 'frost'	*kryž-* 'ice'	*zymn-* 'cold; chilly'	*xolod-* 'cold'	*proxolod-* 'cool'	*litepl-* 'lukewarm'	*tepl-* 'warm'	*harjač-* 'hot'	*žar-* 'hot; torrid; sultry'	*spek-* 'scorching'	*pek-* 'burn'**	*pal-* 'blaze'**	*hri-* 'heat; keep warm'**
nouns	+	+	+	–*	+*	+	+	+	+	–*	–*	+	–*	+	–*
adjectives	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
adverbs	+	+	+	+*	+	+	+	–	+	+	+	+	+	+	–
verbs	+	–*	+	+	–	+	+	–	+	+	+	+	+	+	+

+* rare.
–* lacking (the main) temperature meaning.
** primarily verbal stems.

In addition, there are an interjection *brr* and a noun *djudja* in children's language. Both refer to cold and are of onomatopoeic nature. For the purposes of this paper, adjectives, adverbs and nouns are largely in focus here and later.

All of the stems listed are native and morphologically simple in contemporary Ukrainian, although *proxolod-* 'cool', *litepl-* 'lukewarm; tepid' (lit. "slightly_warm") and *spek-* 'scorching' have been derived from *xolod*, *tepl-* and *-pek-* respectively by means of prefixation. Also, *zymnyj* 'cold; chilly' is not to be confused with *zym-ovyj* 'winter-ADJ' (e.g. 9), although both derive from *zyma* 'winter'.

Crucially for the warming zone in Ukrainian, although the noun *teplo* derives from *teplyj* 'warm(adj)', originally the active present participle *teplъ* from the PS

tepti 'be_warm(IPFV)', according to the etymological dictionary of the ukrainian language,[12] it is the basic noun for naming the state, quality, or sensation of being warm (cf. *warmth* in English) as well as heat energy as a physical quality (cf. *heat* in English). The other derived noun *teplota* 'warmth' primarily means 'heat energy as a physical quality' but also 'warmth' including the figurative senses. For comparison, the adjective *harjačyj* 'hot', which also stems from an active present participle (ibid.), does not have a corresponding temperature noun. Also, *harjačyj* is etymologically related to *žar* (ibid.), a polysemous noun that primarily refers to 'embers', secondly, to 'heat coming from fire or another burning source' and thirdly, to 'fever'.

As regards verbs, only *merznuty* 'freeze; feel_cold(ipfv)', which is related to *moroz* 'frost', addresses a temperature state, although not in its main meaning. Other temperature verbs marked in Table 1 are inchoatives and causatives. Hence they are not relevant for our further discussion with the exception of the verb *morozyty* '(cause to) freeze (ipfv)', which also stems from *moroz* 'frost' and can be used figuratively to address a temperature sensation.

With respect to the intensity of the quality, as evident from the data, there is a bias toward the lexicalisation of hot and cold temperatures as well as some semantic overlaps, especially in the synonymic pairs *xolodnyj – zymnyj* and *harjačyj – žarkyj*, the differences between which will be discussed in Section 3.1.

A degree of intensity can be lexically modified by degree adverbs (intensifiers) like *duže* 'very', *nadzvyčayno* 'extremely', *strašenno* 'terribly' in the 'ADV+ADJ' construction. The intensity and hostility of the cold outdoors may be further augmented by attributing it with *kryžanyj* 'icy(ADJ)' or *sobačyj* 'dog(ADJ)', as in *sobačyj xolod* 'severe cold' (cf. *dog days* 'the hottest period in summer' in English).

Second, not only do different temperature terms address different degrees of the quality, but also some of them exemplify a finer grammaticalised scale of intensity via the system of suffixes in Ukrainian. This is true for adjectives, adverbs and some nouns. Commonly, temperature adjectives and adverbs form regular comparatives and superlatives synthetically by adding the suffix *-iš-* and the prefix *nay-* respectively. Restrictions concern, first and foremost, "the midpoint" *liteplyj* 'lukewarm (adj)', which does not have a corresponding adverb and hardly allows any degree of comparison or modification. Also, *proxolodnyj* in its initial form does not commonly collocate with intensifiers although its comparative form does: *značno proxolodnišyj niž* 'considerably cooler than'. Being a relative adjective, *kryžanyj* 'icy' does not form the degrees of comparison either.

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12. *Etymolohičnyj slovnyk ukrajins'koji movy* (Etymological Dictionary of the Ukrainian Language), 7 vols, edited by Oleksandr S. Meľnyčuk et al. Kyiv: Naukova dumka, 1982–.

The adjectives *tepl-yj* 'warm' and xolodn-yj 'cold' may take attenuative (*-av-; -uvat-*) or augmentative (*-juč-/-jušč-*) suffixes, as in: *tepl-uvat-yj* (e.g. about water, tears); xolodn-juč-yj/xolodn-jušč-yj (about water, winter, blizzard or night). Ameliorative overtones may be expressed via the affectionate (*-en'k-*) and "intensely" affectionate (*-esen'k-; -isen'k-*) adjectival suffixes, as in: *tepl-en'k-yj/tepl-esen'k-yj* (about wind, the sun, cottage); but also *harjač-en'k-yj* (about day, rolls) and *studen-en'k-yj* (about water, commonly from a well). Both attenuative and affectionate adverbs are also registered.

Some temperature related nouns may also express affection (*moroz-on'k–o; xolod-očok,* but not **spek-on'k–a*), attenuation (*moros-ets'; xolod-ok*) and augmentation (*moroz-yšč-e; spek-ovys'k–o,* but not **tepl-yšč-e*). In fact, none of the suffixes above pertain particularly to temperature terms and are used across the given word classes.

2.2   Centrality in the Ukrainian temperature domain

Ukrainian temperature terms range from central to marginal depending on the degree of their salience, familiarity to the whole speech community, morphological simplicity, regularity of grammar, frequency of usage, collocability and domain limitations as well as their origins (Taylor 1995: 49; Plank 2003: 1). On top of these criteria, I took into account the primacy of temperature sense in polysemous words, semantic simplicity of temperature lexemes and their interchangeability within the domain. To determine the last three and to have the first glimpse at frequencies, I semi-automatically queried unilingual dictionary explanations in VTS, which themselves are largely limited to basic language and hence meet the criteria listed above.

As evident from Table 2, among the ten adjectives with the main temperature meaning employed in dictionary explanations to refer to the quality in question, the adjectives xolodnyj 'cold', *harjačyj* 'hot' and *teplyj* 'warm' are clearly set apart from the rest by their frequency. Moreover, they themselves are initially defined via "temperature", "degree" and "intensity", whereas other temperature adjectives are defined in relation to the first three.

In other words, one or two of the three adjectives can potentially substitute any other temperature adjective listed here, when it is used in its temperature meaning, based in the generic – specific relation. This important observation gives rise to a hypothesis that the Ukrainian temperature domain is structured by three concepts COLD, WARM and HOT, each of which is lexicalised by **generic** terms (Table 3), followed by a cluster of **specific** as well as **marginal** terms. Furthermore, generic temperature terms in Ukrainian are prototypically adjectives.

Table 2. Temperature adjectives across dictionary explanations (VTS)

t° terms	*xolodnyj* 'cold'	*harjačyj* 'hot'	*teplyj* 'warm'*	*žarkyj* 'torrid; sultry'	*proxolodnyj* 'cool'	*moroznyj* 'frosty'	*spekotnyj* 'scorching'	*zymnyj* 'chilly; cold'	*liteplyj* 'tepid'	*studenyj* 'bitter_cold'
hits	214	208	152	33	23	11	4	3	2	1
t° sense defined via	't°' + 'intensity'	't°' + 'intensity'	't°' + 'intensity'	*tepl-* + 'intensity' *harjač-*	xolod- + 'intensity'	xolod- + 'intensity'	*žark-* + 'intensity'	xolod- + 'intensity'	*tepl-* + 'intensity'	xolod- + 'intensity'

*homonymy was manually disambiguated.

Table 3. Generic temperature terms in Ukrainian

	COLD	WARM	HOT
adjectives	*xolodnyj*	*teplyj*	*harjačyj*
adverbs	*xolodno*	*téplo*	*hárjače*
nouns	*xolod*	*tepló*	–*

*see Section 2.1 on the absence of the noun.

Support for these hypotheses comes from corpus-based data, which indicate a significant difference in frequency of usage between the generic vs. specific and marginal temperature terms as well as noticeable variation in their distribution across word classes.

Briefly, temperature terms occur 2,347 times in the citations examined (see Table 4), which is 0.052% of the corpus (see Section 1.4). Taken as a whole, adjectives account for 62% of all occurrences, nouns for 31% and adverbs for 6%. For the purposes of this paper, temperature verb frequencies were ignored. Importantly for the current discussion, the generic terms including adjectives, adverbs and nouns make up for 69,6% of all occurrences.

Table 4. Temperature terms in raw frequencies (KTUM)

	xolod- 'cold'**	*tepl-* 'warm/th'*	*harjač-* 'hot'	*moroz-* 'frost/-y'**	*kry(h/ž)-* 'ice/-y'	*žar(-)* 'heat, fever; torrid'	*spe(k/č)-* 'scorching'	*zymn-* 'chilly; cold'	*stu(ž/d)-* 'bitter_cold'	*proxolod-* 'cool/-ness'	*litepl-* 'lukewarm/-ness'*	Total
ADJ	403	330	361	174	106	11	14	33	20	4	0	1456
N	199	224	–	28	47	94	97	0	13	22	23	747
ADV	59	34	24	0	0	10	2	10	2	3	–	144
Total	661	588	385	202	153	115	113	43	35	29	23	2347

*homonymy between word forms pertaining to different word classed was manually disambiguated.
**homonymy between common and proper names was manually disambiguated.

As a side note, the frequencies of temperature terms are also sensitive to register variation. Usage of all temperature terms peaks in poetic contexts and stems with low frequencies are largely or completely limited to poetry. Collocational differences are also register dependent. For instance, in media *xolodnyj* 'cold' strongly collocates with 'war' and *harjačyj* 'hot' with 'water' and 'line'. However, in folklore *xolodnyj* and *studenyj* commonly co-occur with 'water' and *harjačyj* with 'tears'.

A further discussion of Ukrainian temperature terms requires taking into consideration differences in the phenomenological and referential variations of temperature conceptualisation.

3. Sub-domains of temperature experience

Conceptualisation in general (Heine 1997: 40) and the experiential domain of temperature in particular (Koptjevskaja-Tamm & Rakhilina 2006: 256) are fundamentally anthropocentric. However, along with the body-centred frame of reference, object-centred and environment-centred frames (in terms of Carlson-Radvansky & Irvin 1993: 224; Levinson 2003: 30) are arguably employed to categorise a variety of thermal experiences, which have to do with human orientation in the world. Coupled with climatic conditions and cultural modes, Ukrainian "thermal coordinates" include the oppositions between frost and ice outdoors and fire or heat from the stove indoors in the cold season; air heated by the sun and cold ground water, commonly from a well or a spring in the warm season; as well as warmth of the living body and cold of the dead. These referential points suggestively inform temperature evaluation in the

sub-domains of ambient, touch and personal-feeling temperature (in terms of Plank 2003:2; Koptjevskaja-Tamm 2007) as it is expressed in the Ukrainian temperature domain.

Ukrainian employs somewhat different lexical means and syntactic patterns within each of these sub-domains (3.1–3.3), which are restricted both by linguistic norms and extralinguistic reality. Lexical and morphosyntactic asymmetries are briefly dealt with in 3.4.

3.1   Ambient temperature: Outdoors, indoors and clothes

Temperature expression is linguistically the most diverse within the sub-domain of ambient temperature and clothing. The range of temperature values for outdoors and indoors is lexically well-calibrated. In fact, the same temperature adverbs functioning as impersonal predicates may indicate temperature outdoors and indoors (2) except for *studeno* 'bitter_cold' and *morozno* 'frosty', which are not applicable for the ambient temperature indoors.

> (2)   *Tut spekotno/žarko/harjače/teplo/proxolodno/xolodnavo/zymno/xolodno/*
> *studeno/ morozno.*
> 'It is scorching/ torrid/ hot/ warm/cool/chilly/cold/cold/ bitterly cold/frosty
> here.'

Adjectives used for ambient temperature outdoors, especially at a particular time-period, such as a day or season, exemplify one of the most finely graded temperature scales in Ukrainian (Table 5) (cf. Table 6 for the temperature adjectives applied to water), although overlaps are possible. For instance, *žarkyj* may indicate both 'hot' and 'intensely hot' temperatures and *zymnyj* may mean either 'moderately cold' or 'cold' depending on context. Also, *žarkyj* and *harjačyj* may be interchangeably attributed to sources of heat (the sun, fire), conductors of heat (air) or time-periods (summer, day). In addition, *žarkyj* collocates with climate (5) and clothes (9), whereas *harjačyj* is also used to indicate the temperature of objects which are hot to touch (Section 3.2). Differences in the figurative meanings of *harjačyj* and *žarkyj* are addressed in Section 4. Also, the frequency of usage for *harjačyj* is significantly higher (Table 4). In the *xolodnyj/zymnyj* pair, on top of differences in the frequency of usage (Table 4), collocability and register restrictions, *zymnyj* is more common for the Western Ukrainian variation in contemporary everyday language.

Remarkably, the adjectives *pekučyj* 'burning', *šparkyj* 'scalding' and *žarkyj* 'torrid' (but not *harjačyj* 'hot') are also conventionally used in reference to oppressive frost (e.g. *pekučyj moroz* 'burning frost'), since both intense heat and intense cold may cause a similar sensation of burning. However, intensely cold attributes are restricted to the cold zone.

Table 5. Adjectives for ambient temperature outdoors

centrality \ value	'intensely cold'	'cold'	'cool', 'chilly'	'warm'	'hot'	'intensely hot'
generic		*xolodnyj*		*teplyj*	*harjačyj*	
specific	*studenyj* *moroznyj*	*zymnyj*	*proxolodnyj* *xolodnavyj* (dial.)		*žarkyj*	*spekotlyvyj* *spekotnyj* *spečnyj*
marginal	*kryžanyj*		*svižyj* *jadernyj*			*pekučyj* *paljučyj* *žahučyj* *šparkyj* *škvarnyj* (dial.)

The Ukrainian language makes a basic distinction between the two halves of the year by activating the concepts WARM and COLD respectively: *tepla pora roku* 'the warm time of the year' and *xolodna pora roku* 'the cold time of the year'. Nonetheless, either member of the antonymous pair *teplyj* 'warm' – *xolodnyj* 'cold' may be conventionally used to modify any of the four seasons, when meteorological conditions of a particular season are in focus. The point of reference in these cases is (largely) based not in bodily sensations, as it obviously feels warmer in the cold summer (3d) than in the mild (lit. "warm") winter (3a), but in the norm expected for each season. Since (3b) and (3c) are considered to be the norm, (3a) and especially (3d) connote negative evaluation.

(3) a. *tepl-a*   *zyma*
         warm-F.NOM.SG winter:F.NOM.SG

     b. *xolodn-a*   *zyma*
         cold-F.NOM.SG   winter:F.NOM.SG

     c. *tepl-e*   *lito*
         warm-N.NOM.SG   summer:N.NOM.SG

     d. *xolodn-e*   *lito*
         cold-N.NOM.SG   summer:N.NOM.SG

Depending on the amount of heat radiation and consequently the sensation of warmth or lack thereof, the attributes for the sun or sun rays can gradually range from 'oppressively hot' to 'cold', as *xolodne sontse* 'cold sun' does not make one feel warm in winter. The moon and the stars as well as their glow are conventionally cold, though the moon's colour may be 'warm' (see Section 4.1). Open areas and regions, forests, gardens and other shadowy localities are associated with coolness, mountains with coldness, fields with hotness and steppe with extreme temperatures, either high or low.

As for satisfaction value, e.g. *proxolodnyj ranok* 'cool morning' may be either pleasantly or unpleasantly cool and *morozne povitrja* 'frosty cold air' is rather welcome

in winter because it meets the norm for that season. However, e.g. *kryžanyj viter* 'icy cold wind' is piercing and thus unpleasant. *Zymnyj* is also likely to connote discomfort.

Unlike classes of entities with immediately experienced and/or constantly changing temperatures, the gradability of entities and phenomena that are known to have given temperatures is restricted. Some binary oppositions pertaining to the sub-domain of ambient temperature may lack the mid-interval (4), where the conditions are defined in relation to each other, or it may be marked with a term not limited to the temperature domain, e.g. *pomirnyj* 'moderate' in (5).

(4) a. *tepl-yj*   *front*
         warm-M.NOM.SG   front:M.NOM.SG

     b. *xolodn-yj*   *front*
         cold-M.NOM.SG   front:M.NOM.SG

(5) *krajiny*   *z*   *žark-ym / tepl-ym / pomirn-ym /*
     countries   with   torrid-M.INS/warm-M.INS/moderate-M.INS /

     xolodn-ym   *klimatom*
     cold-M.INS   climate:M.INS.SG

     'countries with the torrid, warm, moderate, cold climate'

The abstract deadjectival nouns *harjačin'* and *žarin'*, both meaning 'torrid_heat', *teplin'* 'warmness', *xolodneča* 'extreme_coldness' are employed to emphasise the intensity of the quality, but their usage is rare and register-bound. Also, a longer period of cold or frosty weather is addressed with the nouns in plural *xolod-y* 'cold-PL' or *moroz-y* 'frost-PL' although other temperature nouns like *stuža, teplo* or *speka* do not form the plural.

Importantly, a lexicalised thermometer-based expression of outdoor temperature (6a), is structured by the binary opposition *teplo – moroz*: the temperature above zero is referred to as a degree of *teplo* 'warmth' and the temperature below zero is a degree of *moroz* 'frost'. The UP-DOWN opposition motivates the alternative expressions (6b), which are interchangeable with (6a). Both patterns are conventionally used in weather forecasts to avoid monotony.

(6) a. *odyn* *hradus* *moroz-u*   */ tepl-a*
         one   degree   frost-M.GEN.SG / warmth-N.GEN.SG
         'one degree below/above zero' (lit. "one degree of frost/warmth")

     b. *odyn* *hradus* *nyžče*   */ vyšče*   *nulja*
         one   degree   below   / above   zero:M.GEN
         'one degree below/above zero'

Nouns in the ambient sub-domain may stand for places or areas with a given temperature based in metonymy. Commonly, (7) and (8) indicate the location of living beings, but also food items (except for 8a). The distinction between indoors and outdoors is transparently reflected in the prepositions:

(7) a.   *u   tepl-i*
         in warmth-N.LOC.SG
         'in a warm place'

     b.   *u   /   na   xolod-i*
         in / on cold-M.LOC.SG
         'in a cold place/out in the cold'

(8) a.   *na   spets-i*
         on scorching_heat-F.LOC.SG
         'under the scorching sun'

     b.   *na   moroz-i*
         on frost-M.LOC.SG
         'out in the freezing cold'

The inside of a building is characterised via the categorial opposition WARM – COLD depending on the availability of heating or insulation. In folk architecture, *tepla/ xolodna polovyna xaty* 'the warm/cold half of the cottage' is used in the winter/summer respectively. The same is true about *teplyj xram/vivtar* 'warm church/altar', although the other (summer) church is rarely marked as 'cold'. The mid-interval of the temperature scale for indoors is *kimnatna temperatura* 'room temperature'.

Ukrainian temperature terms proper do not have explicit restrictions as for their applicability to dry or wet conditions. However, references to humidity in the air outdoors or indoors may imply either warming or cooling temperature, as in the polysemous noun *var* 'oppressive_heat_and_humidity' (from *varyty* 'boil.INF.IPFV'; cf. Table 6) or the adverbs parko 'hot_and_stuffy' (from *para* 'steam') and syro 'chilly_ and_moist' (cf. *muggy* and *dank* in English respectively).

Along with immediate temperature perception or intention to feel warm or cold in relation to articles of clothing, Ukrainian temperature terms are used to describe types of clothes. A major categorial distinction between those clothes that insulate the human body (9a) and those which do not (largely) prevent the transmission of heat between the body and the environment (9b) is lexicalised via references to temperature but also to the season in which they are worn or the thickness of the fabric they are made of.

(9) a.   *tepl-yj*   */ zymovyj*   *odjah*
         warm-M.NOM.SG /winter(ADJ):M.NOM.SG clothing
         'clothing worn in cold weather'

     b.   *lehkyj*   */ litniy*   */ xolodn-yj**   *odjah*
         light:M.NOM.SG / summer(ADJ):M.NOM.SG /cold-M.NOM.SG clothing
         'clothing worn in warm weather' (*rarely used)

Most commonly, articles of clothing and bed covers collocate with *teplyj* 'warm'. They may be semantically marked as sources of warmth, which make one feel comfortable:

e.g. *tepla šuba* 'warm fur_coat', *teplyj ližnyk* 'warm hand-woven_blanket'. On the other hand, *žarkyj župan* 'hot (old-style) coat' suggests that an article is too warm and thus makes one feel uncomfortable.

Ukrainian semantic and collocation patterns in the ambient sub-domain noticeably differ from those in the sub-domain of touch temperature.

3.2 Touch temperature

The sub-domain of touch-temperature is first and foremost motivated by a sense of immediacy of temperature experience and it is prototypically informed by our experience with water. It comes as no surprise that *voda* 'water.NOM.F' does not conventionally collocate with adjectives used for oppressively hot ambient temperature (see Table 5) and that this segment of touch temperature has its specific expression (Table 6).

Table 6. Temperature terms for water

value \ centrality	'intensely_ cold'	'cold' 'chilly'	'cool'	'luke' (NOUN/ ADJ)	'warm'	'hot'	'boiling_ water" (NOUN)'
generic		*xolodnyj*			*teplyj*	*harjačyj*	
specific	*studenyj* *kryžanyj*	*zymnyj*	*proxolodnyj*	*liteplyj*-ADJ *liteplo*-NOUN			*okrip* *kypjatok**
marginal					*litnyj*		*var** *kypin** *kypjač**

*colloquial.

Particular temperature values for water have dedicated nouns (*okrip* 'boiling water'; *liteplo* 'lukewarm water'). Water used for particular purposes is also specified (*kupil'* 'warm water for bathing babies'; *mytel'* 'warm alkaline water for washing'). The mid-interval for water indoors can be indicated in relation to ambient temperature, as in "water of room temperature".

Generally speaking, in the touch sub-domain temperature terms are used to evaluate entities in three ways. Examples of entities evaluated through a range of temperatures from HOT to COLD include stones or rock, sand and currents of air affecting the skin. Also, temperature values can point to a time frame, as in "hot ashes" (still hot to touch) vs. "cold ashes" (already cold). The mid-interval in these cases may be *neharjačyj* 'not hot', i.e. one that has lost (some) heat but is not cold yet. The WARM – COLD opposition is utilised when there are objective restrictions on the attribution of *harjačyj* 'hot' to, for instance, names of soil, rain or large bodies of water.

Other entities are strongly associated with one temperature zone either due to their permanent quality (e.g. "hot as fire/embers"; "cold as ice/marble", both literally

and figuratively) or because of utilitarian expectations (e.g. radiators, frying pans and irons). The third way in which temperature terms are used is to mark categories of entities, often as binary oppositions (10).

(10)   a.   *harjač-yj*   / *xolodn-yj*   *kran*
            hot-M.NOM.SG / cold-M.NOM.SG faucet:M.NOM.SG
            'hot/cold faucet'

       b.   *tepl-i*   / *xolodn-i*   *morja*
            warm-NOM.PL / cold-NOM.PL sea:NOM.PL
            'warm/cold seas'

The temperature evaluation strategies outlined above can be further illustrated in relation to food. Indeed, food temperature is an interesting perceptual phenomenon because it brings together two physiologically distinct sensations, touch and taste, into one. Put differently, taste is addressed as a "kind of touch performed by the tongue" (Popova 2005: 407). On top of immediately experienced food temperatures ranging from "boiling hot" to "frozen", temperature terms mark categories of dishes via HOT – COLD oppositions (11–12). Moreover, names of some categories are substantivised (11b, 12b).

(11)   a.   *harjač-i*   / *xolodn-i*   *stravy*
            hot-NOM.PL / cold-NOM.PL dish:NOM.PL
            'first and main courses, served hot/cold'

       b.   *harjač-(en'k)-e*
            hot-(DIM)-N.NOM.SG
            'the first or main course that is served hot'

(12)   a.   *harjač-i*   / *xolodn-i*   / *proxolodn-i* *napoji*
            hot-NOM.PL / cold-NOM.PL / cool-NOM.PL drink:NOM.PL
            'drinks served hot; drinks served chilled or iced; refreshing drinks'

       b.   *proxolodn-e*
            cold-N.NOM.SG
            'a refreshing drink or refreshing drinks'

Dishes and drinks in the "hot" category, such as borsch, pancakes, tea or coffee, are expected to be quite hot to touch. Dishes in the "cold" category like herring or marinated vegetables are expected to be of room temperature and drinks like kvass or beer have to be chilled. If these expectations are not met, the temperature adjectives, as in (13), take on a negative connotation.

(13)   a.   *pyvo*   *tepl-e*
            beer:N.NOM.SG warm-N.NOM.SG
            'The beer is warm.'

       b.   *čay*   *xolodn-yj*
            tea:M.NOM.SG cold-M.NOM.SG
            'The tea is cold.'

The major division into hot and cold dishes in Ukrainian cuisine is further consolidated in a number of lexicalised names of dishes which derive from the stems *harjač-* 'hot', *xolod-* 'cold' and *stud-* 'cold', e.g. *studenets'* is jellied meat.

3.3　Personal-feeling temperature vs. body temperature by touch

Human bodies (and their parts) are subject to two kinds of temperature evaluation, namely personal-feeling and touch temperatures (Koptjevskaja-Tamm 2011: 400). Importantly, the personal-feeling sub-domain varies in a set of temperature-value oppositions and typical syntactic contexts depending on whether subjectively experienced temperature or high body temperature that accompanies an illness or disease is addressed.

　　Subjectively experienced temperature is commonly expressed via predication, as in (14a), where any out of nine temperature adverbs proper can be used, similarly to the ambient sub-domain; cf. (2). Specific features of the personal-feeling sub-domain include a distinction between feeling temperature in the whole body (14a) or in its part (14b) as well as usage of the verb *merznuty* in the 'cold' zone (15).

(14)　a.　*Meni　　xolodn-o*
　　　　　1SG.DAT　cold-ADV
　　　　　'I am cold.'; cf. (15)

　　　b.　*Meni　　v　nohy　　　　zymn-o*
　　　　　1SG.DAT　in　foot:ACC.PL　cold-ADV
　　　　　'My feet are cold.'

(15)　*Ja　　　　merzn-u*
　　　1SG.NOM　freeze(IPFV)-PRS.1SG
　　　'I am freezing.'; cf. (16b)

On the other hand, expression of high body temperature is lexically and syntactically restricted to a few idiomatic options. Fever is conventionally hyperbolised as either oppressive heat (16a) or as related to frost (16b), although the range of actual body temperature is objectively quite narrow. Also, in neither of these predications the experiencer is in the nominative (cf. 37).

(16)　a.　*U　mene　　žar-ø*
　　　　　at　1SG.GEN　heat_from_burning_source-NOM.SG
　　　　　'I have a fever.'

　　　b.　*Mene　　moroz-yt'*
　　　　　1SG.ACC　freeze(IPFV)-PRS:3SG
　　　　　'I have the shivers.' (lit. "(It is) freezing me.", i.e. "It is causing me
　　　　　to freeze.")

In fact, along with references to fire and frost, body temperature can be indicated in relation to the thermometer in Ukrainian (cf. (6) for thermometer-based expression

of ambient temperature). The opposing points on this scale are expressed as presence or absence of the quality (17), which stand for presence or absence of its elevation. The UP-DOWN opposition is expressed in temperature attribution, e.g. "elevated/not high/high temperature".

(17) a. *U   mene   temperatura*
       at   1SG.GEN   temperature:F.NOM
       'I have a temperature.'

   b. *U   mene   nemaje   temperatury*
       at   1SG.GEN   NEG.PRED   temperature:F.GEN
       'I do not have a temperature'

Experiencing personal temperature of the whole body or its parts "from inside" is opposed to feeling the temperature of the body or its parts by touch. The latter experience pertains to the sub-domain of touch temperature and is expressed overall via syntactic and lexical patterns common for touch temperatures in general (Koptjevskaja-Tamm 2011: 405). Assumptions about someone else's fever also activate the concept HOT in Ukrainian. The evaluation of a body part by touch, as in (18a), also enables a generalisation about the whole body, especially of a child (18b). It can further extend to (18c), when the intensity of fever is subject to emphasis. Otherwise, the predication (18b) is reduced to metaphorical uses.

(18) a. *Lob   harjač-yj*
       forehead   hot-M.NOM.SG
       'The forehead is hot.'

   b. *Vona   harjač-a*
       she   hot-F.NOM.SG
       'She is hot.'

   c. *Vona   hor-yt'*
       she   burn(IPFV)-PRS:3SG
       'She has a high fever.' (lit. "She is burning.")

In the WARM-COLD opposition, body warmth is viewed as a sign of physical well-being and is usually unmarked (cf. the idiomatic 19), and body cold (20) indicates that someone does not show signs of life.

(19) *Ledve   žyvyj   ta   tepl-yj*
     scarcely   alive:M.NOM.SG   and   warm-M.NOM.SG
     '(Someone is) in very poor physical condition.' (lit. "(Someone is) scarcely alive and warm.")

(20) *Mertva   xolodn-a   Jaryna   ležala   tak*
     dead:F.NOM.SG   cold-F.NOM.SG   Jaryna.NOM   lie:PST:F.SG   ADV.MAN

> *jak spala*   (S. Skljarenko)
> as   sleep:PST
> 'Dead and cold Jaryna was lying in the same manner as she had slept.'

Morphosyntactic and lexical asymmetries among the temperature sub-domains in Ukrainian are summarised and some cross-linguistic parallels are made in Section 3.4.

3.4   Asymmetries across the temperature sub-domains

Although the generic stems expressing HOT, WARM and COLD concepts in Ukrainian neutralise the distinctions among the temperature sub-domains, asymmetries come to the fore at the level of morphosyntax. In the most common predicational constructions (cf. similar examples from other languages in Koptjevskaja-Tamm 2011: 397–398), Ukrainian employs adjectival predication with the subject in the nominative and the agreeing adjective as the predicative to express both touch and ambient temperatures (21a, b). On the other hand, the ambient and personal sub-domains require impersonal constructions with the adverb as the predicative (21b, c). They differ only in the presence of the experiencer used in the dative case in personal-feeling predications: cf. Finnish (Juvonen & Nikunlassi, this volume). Also, all these constructions in Ukrainian omit the copula verb 'to be' in the present tense.

(21) a. Touch: *Kamin' harjač-yj/   tepl-yj /   xolodn-yj*
                   stone   hot-M.NOM.SG warm-M.NOM.SG cold-M.NOM.SG
                   'The stone is hot/warm/cold.'

     b. Ambient: *Den' harjač-yj /   tepl-yj /   xolodn-yj*
                   day   hot-M.NOM.SG warm-M.NOM.SG cold-M.NOM.SG
                   'The day is hot/warm/cold.'

                  Tut   harjač-e / tepl-o /   xolodn-o
                   here hot-ADV   warm-ADV cold-ADV
                   'It is hot/warm/cold here.'

     c. Personal: *Meni   harjač-e / tepl-o /   xolodn-o*
                    1SG.DAT hot-ADV   warm-ADV cold-ADV
                    'I am hot/warm/cold.'

The asymmetry of syntactic patterns across the temperature sub-domains in Ukrainian is summarised in Table 7. The data show that temperature attribution (*xolodnyj kamin'/den'* 'cold stone/day') and adjectival predication (*Den'/Kamin' xolodnyj* 'Day/Stone is cold') as well as temperature reference (*xolod mertvoho tila/xolod noči* 'cold of the dead body'/'cold of the night') lump the touch and ambient sub-domains together. On the other hand, adverbial predication (*Tut/Meni xolodn-o* 'It is cold-ADV here/I'm cold-ADV') groups together the ambient and personal-feeling sub-domains and verbal

predication (*Ja merzn-u* 'I freeze(IPFV)-PRS.1SG') singles out the personal-feeling sub-domain. Other specificities include nominative sentences in the ambient sub-domain (*Spek-a* 'Scorching_heat-NOM', i.e. 'It is scorching') and substantivised adjectives in the touch sub-domain, as in *xljupnu-ty xolodn-ym* 'splash-INF cold-INS', lit. "splash the cold_one (on someone)."

Table 7. Asymmetry of syntactic patterns across the sub-domains in Ukrainian

	TOUCH	AMBIENT	PERSONAL-FEELING
Attribution	yes	yes	restricted to metaphor
Predication:			
adjectival	yes	yes	restricted
adverbial	no	yes	yes
verbal	no	no	yes
Reference	yes	yes	no

Similarly to German (Plank 2003) and Greek (Stathi, this volume), Ukrainian adjectives are freely used as attributes and predicates in the touch and ambient sub-domains, but are commonly restricted to a few metaphorical uses in the personal-feeling sub-domain. Temperature verbs of state in Ukrainian occur only in the personal-feeling sub-domain, which is in line with the minimal verb strategy in Romanian, Hungarian and some other languages (see Koptjevskaja-Tamm 2011:403 on 'freeze' verbs). Ukrainian temperature nouns are freely used in the ambient sub-domain but they express a reduced set of temperature values in the other sub-domains.

Lexical distinctions among the temperature sub-domains in Ukrainian become apparent when specific and marginal terms get involved. For instance, both *žark-o* 'torrid-ADV' and *spekotn-o* 'scorching-ADV' are used for the ambient and personal-feeling evaluations but not in the touch sub-domain. The lexicalisation of the 'hot' zone in Ukrainian noticeably differs from the one in Russian (Koptjevskaja-Tamm 2011:395), where *gorjačij* qualifies only touch temperatures, *znojnyj* is restricted to high temperatures generated by the sun and *žarkij* applies to high temperatures in the ambient and personal-feeling sub-domains.

4. Semantic extensions of temperature terms

The framework for description in this section relies on the understanding of semantic extensions of temperature terms as being dually motivated. On the one hand, like other conventional metaphors and metonymies (Lakoff 1987) semantic extensions of temperature terms are rooted in our everyday experience. On the other hand, they

play a role in cultural categorisation (Geeraerts & Grondelaers 1995) and may be variously employed to refer to perceptual modalities, emotions, individual traits and interpersonal relations, social behaviour and communication as well as time and space (cf. Narayanan 2008).

4.1   Temperature terms across perceptual modalities

Ukrainian temperature terms systematically occur in conventional evaluations of a variety of sensory experiences other than temperature sensations proper. They play a role in conventional verbal synaesthesia, i.e. the linguistic representation of cross-sensory experience (Popova 2005: 397), and address all senses in Ukrainian.

In particular, the sub-domain of touch temperature seems to be the conceptual source for expressions referring to various cutaneous sensations as well as to taste and scent. For instance, *pekučyj bil'* 'smarting pain' (lit. "burning pain") activates the concept HOT. Similarly, the sensation of heat on the skin caused by flogging for the purpose of punishment motivates the idiom (22a; the temperature adjective is substantivised). Note that (22b) is motivated by an emotional reaction rather than skin sensation; cf. *to give it hot* in English.

> (22)   a.   *vsypaty   harjač-yx*
>   give(PFV):INF   hot-GEN.PL
>   'to flog' (lit. 'to give the hot (birch)')
>
>   b.   *zavdaty   žar-u*
>   inflict(PFV):INF   heat-GEN(ACC).SG
>   'to give a scolding'

As for other senses, there are quite a few semantic extensions of temperature terms to taste in Ukrainian. Spicy food is primarily expressed via sharpness rather than hotness. However, associations between burning and taste are also possible, when excessive sharpness is emphasised: e.g. *pekučyj perets'/*časnyk (lit. "burning pepper/garlic"). Peppermint (Mentha piperita L.) is perceived as causing a sensation of cold in the mouth, which is lexicalised in its conventional name *xolodna mjata* (lit. "cold mint").

Extensions from temperature to scent primarily involve the concept WARM. Indeed, it is quite natural to attribute both temperature and odour to, for instance, steam coming from a freshly cooked or heated dish (23):

> (23)   *tepl-a   zapašna   para*
>   warm-F.NOM.SG   odouriferous:F.NOM.SG   vapour:F.NOM.SG
>
>   *vid   pečeni*
>   from   roast_meat:F.GEN.SG
>   'warm odoriferous vapour (coming) from the roast'

Experience of non-touch temperature suggestively motivates projections to visual and sound images. Namely, temperature can be "visualised" via references to light and colour, where either WARM or HOT are opposed to COLD, as in *teple/xolodne svitlo* 'warm/cold light', *tepli /xolodni kolyory* 'warm/cold colours'. The denominal stems *žar*(-) and *vohn-* (from *vohon'* 'fire') extend metonymically to name specific hues of red, as in *žarka barva* 'bright red colour' or *žarystyj misjats'* 'bright red moon', whereas *harjač-* can be used for bright colours other than red or yellow (24).

(24) *Harjač-oju zelenoju   barvoju   horyt'   na*
      hot-F.INS   green:F.INS colour:F.INS burn:PRS.3SG on

      sontsi   jačmin'   (M. Kočjubyns'kyj)
      sun:LOC barley:NOM.

      'The barley is burning with a rich green colour in the sun'.

The cold palette is conventionally limited to blue and violet and is commonly associated with large masses of water or sky as well as light or lustre, as in "cold light blue shine of the moon". Yet cold blue that makes one feel the lack of warmth and hence extend it to emotional discomfort can be opposed to warm blue. In (25), there may be a reference to the sunny sky or by further extension to one of the colours of the Ukrainian national flag.

(25) *blakyti   ukrajins'koji   tepl-o*   (D. Pavlyčko)
      azure:F.GEN.SG Ukrainian:F.GEN.SG warmth-N.NOM.SG
      'the warmth of the Ukrainian azure'

Metaphorical mappings from temperature to sound are conventionally confined to the WARM – COLD opposition. While a reference to temperature can emphasise a particular acoustic effect, which might suggest a thermal sensation, as in *xolodna tyša* 'cold silence', *teplyj zvuk rojalja* 'the warm sound of the grand piano' or *teplyj peredzin* 'warm chime', sound as well as other perceptual modalities are often only an intermediate step in the series of mappings TEMPERATURE → (OTHER) PERCEPTION → EMOTIONS (cf. Popova 2005:412).

4.2   Temperature of emotions

The realm of emotions and traits is a "target rich domain" for temperature terms in Ukrainian. Although numerous and lexically variable, mappings from temperature to emotional states, attitudes, relations and the like can be briefed in the major oppositions of HOT and COLD for both enthusiasm (passion) – indifference and arousal – calmness and WARM and COLD for amiability – antagonism. These conceptual oppositions branch into a variety of senses and often overlap one another. A rough distribution of "emotional" temperature oppositions (marked with arrows) and their axiological connotations (marked with plus and minus signs) is offered in Figure 1.
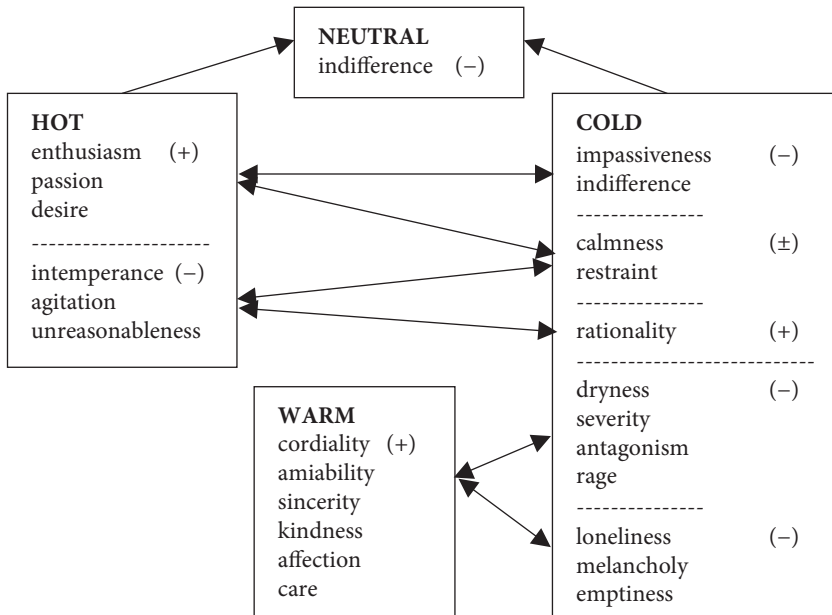
Figure 1. Senses related to emotions and traits across the temperature domain

Enthusiasm, zeal, passion and desire are associated with burning hot temperatures caused by fire and flames and are worded as *palkyj* 'ardent' (attributed to 'love', 'heart', 'passion', 'discussion', 'speech', 'supporter', etc.) and *polumjanyj* 'flaming' (attributed to 'orator', 'revolutionary', often sarcastically). *Harjače sertse* 'hot heart' and *žarka promova* 'hot speech' are also possible, but *spekotnyj* 'scorching' is not used in these contexts.

Intemperance, which is looked down upon in Ukrainian culture, is first and foremost expressed by *harjačyj* 'hot' that collocates with 'head', 'argument' and is also used as a quasi-referential predicate. *Harjačkovyj* 'feverish' further extends to 'restlessly excited' and 'nervous' (cf. 33). A sensation of abrupt agitation or anxiety is compared with sensing hot cinders or embers (26):

(26) *Jak   xto   kynuv   harjač-oho   prysk-u*
      CNJ someone throw:PST.PFV hot-M.GEN.SG embers-GEN.SG.M
      'Someone became suddenly agitated.' (lit. '… as if someone threw some
      hot embers (on someone else)')

Something heard or seen that causes an abrupt change of the experiencer's state, namely from emotional arousal to discouragement, is associated with cold water (27) or a cold shower poured on the experiencer.

(27) *jak   zymn-oju   vodoju   oblytyj*
      CNJ cold-F.INS.SG water:F.INS.SG pour:PST.PASS.PFV.M.SG
      'someone is abruptly discouraged' (lit. 'as if cold water has been poured on
      someone')

WARM has to do with emotional comfort, as in *tepli počuttja* 'warm feelings' or *tepla kompanija*, lit. 'warm company' said of a group of close friends who are having fun together. That is why WARM can be opposed to either HOT, as in (28) or more commonly COLD, as in (29):

(28) a. *tepl-a*   *besida*
          warm-F.NOM.SG talk:F.NOM.SG
          'a heart-to-heart talk'

      b. *palk-a*   *dyskusija*
          ardent-F.NOM.SG discussion:F.NOM.SG
          'a heated discussion'

(29) a. *duševne*   *tepl-o*
          soul(ADJ):N.NOM.SG warmth-N.NOM.SG
          'warm-heartedness'

      b. *duševnyj*   *xolod-ø*
          soul(ADJ):M.NOM.SG cold-M.NOM.SG
          'cold-heartedness'

In the realm of emotions, WARM is always positively connoted, which is not always the case in literal senses (cf. 3a; 13a).

COLD when used in opposition to both HOT and WARM, covers a wide range of emotional states and traits, including but not limited to the lack of features expressed via HOT and WARM. Impassiveness and some other states can vary in the degree of intensity addressed via the cold zone, as in *xolodnyj spokij* 'cold calmness' and *kryžanyj spokiy* 'icy calmness'. Overall, rationality, calmness and restraint may get a positive or negative evaluation depending on the context, whereas other senses related to COLD are negatively connoted (see Figure 1). Quite peculiarly, indifference in the sense of lacking interest or involvement or having no effect upon the experiencer may also be expressed via the negation of either cold and hot or cold and warm (30).

(30) *Yomu   vid   tsyoho ni   harjač-e ni   zymn-o* /
      3SG.DAT because_of it:GEN NEG hot-ADV NEG cold-ADV /

      ni   zymn-o   ni   tepl-o
      NEG cold-ADV NEG warm-ADV

      'It is all the same to him.' (lit. '(It is) neither hot nor cold to him because of it.')

In point of fact, complex feelings like love or anger may be characterised in Ukrainian via a reference either to the hot or to the cold zone, depending on the attributes highlighted. For instance, *palke koxannja* 'ardent love', based on a strong emotional affection and an intense sexual desire, is antonymous to *xolodna ljubov* 'cold love', which presupposes respect and sympathy but lacks emotional attachment and sexual responsiveness (cf. SEXUAL DESIRE IS HEAT in several languages in Kövecses 2006: 255–256 and elsewhere).

A sudden short display of anger is associated with literally a "flash of anger", i.e. 'a fit of anger', whereas deep-seated anger may be expressed as numb and stiff severity, which is to do with COLD. Cold anger is very hostile, possibly coupled with menace or contempt, as in lit. "barbed icy look", "icy voice" (cf. ANGER IS HEAT in several languages in Kövecses 2006: 40–41).

Fear is first and foremost associated with COLD and its conceptualisation is rooted in embodied experience. An instance of fright resembles a sensation of cold, frost or running ants on one's skin (31) and the state of intense anxiety or alarm may indeed result in perspiration (lit. "cold sweat") or a shiver (lit. "cold shiver").

(31)　*moroz*(-*ets'*)　　　/ *xolod*(-*ok*)　　　/ *xolodn-i*　　　*muraxy*
　　　　frost:M.NOM(DIM) /cold:M.NOM(DIM) /cold:ADJ-NOM.PL ant:NOM.PL

　　　　po　　spyn-i
　　　　over　back-LOC

　　　　'(It makes me feel) creepy all over.' (lit. "… frost/cold/cold ants
　　　　(is/are creeping) all over the back.")

However, intense agitation, possibly accompanied by fear, is interpreted as a wide swing in temperature sensations (32); cf. (30).

(32)　*Yoho　　　kydalo　　　　　to　v　žar-ø*
　　　　3SG.M.ACC throw(IPFV):PST.N CNJ in heat_from_fire-ACC

　　　　to　v　xolod-ø
　　　　CNJ in cold-ACC

　　　　'He felt hot and cold all over.'

To sum up, gradability of "emotional" temperature terms varies similarly to literal senses. A fine-grained scale including *palkyj* 'ardent', *teplyj* 'warm', *proxolodnyj* 'cool', *zymnyj* 'chilly', *xolodnyj* 'cold', *studenyj* 'bitter_cold' and *kryžanyj* 'icy' is used to describe one's look, eyes or words. Other traits and attitudes, e.g. "hot/cold head" and "warm/cold welcome" are referred to as binary oppositions. Yet others like *harjači slyozy* 'tears caused by strong emotions' (lit. "hot tears") and *pid harjaču ruku* 'at the moment of extreme irritation; while being angry' (lit. "under the hot hand"; cf. *in the heat of the moment* in English) do not have parallel forms addressing the opposite temperature zone.

Importantly, although intensity of emotions is conventionally related to heat (Kövecses 2006: 262), it does not entail that the lack of emotions is necessarily encoded as the lack of heat. Ukrainian terms for cold and oppressively cold temperatures qualifying intense negative emotions suggest that in some cases it is not a particular temperature zone but rather a degree of intensity that really matters.

Intensity conceptualised in terms of temperature further develops in several directions.

4.3 Temperature extensions to action, time and location

Ukrainian employs the whole temperature spectrum to qualify the intensity of work. It includes *speka roboty* (lit. 'scorching_heat of work'); *harjača pora* 'busy time' (lit. 'hot time_period'); *teple mistse* (lit. 'a warm place'), i.e. an occupation that does not require too much effort and in addition is profitable; and *pratsjuvaty z xolod-k-om* 'to lack enthusiasm for work' (lit. 'to work with cold-DIM-INS').

Dealing with something risky or unpleasant can be associated with either oppressively hot (lit. 'to gather embers with another's hands'; cf. *to pull someone's chestnuts out of the fire in English*) or oppressively cold temperatures (lit. 'to not let (someone) touch even bitter cold water', i.e. 'to not let one do any work') or it activates both opposites ('to seize hot and bitter cold (things)', i.e. 'to be eager to do all sorts of work').

On the other hand, the same temperature concept can encode various degrees of intensity. The concept HOT ranges from 'tense' in *harjača superečka* 'hot argument' (cf. 28b) to 'fierce' and 'violent' in military conflicts: *harjača striljanyna* 'hot shooting' *harjačyj bij* 'hot battle' Cf. COLD in *xolodna vijna* 'cold war' conveys military tension, political aggression and hostility, which literally lack only fire.

Also, HOT can qualify both speed, particularly swiftness coupled with excitement, as in *harjačyj kin'* 'hot horse' and haste resulting in the lack of thoroughness and consideration (33).

(33) *Vin zanadto harjač-yj ščo ne robyt' vse bihom*
      he too hot-M.SG what NEG do:3SG.PRS all run.ADV
      'He is too rash, whatever he does is done in haste.' (after S. Olijnyk)

Along with speed, high temperature is associated with the immediacy of action, as in (34); the temperature adjective is substantivised:

(34) *vpiymaty na harjač-omu*
      catch(PFV):INF on hot-LOC.SG
      'to catch on the spot' (lit. 'to catch on the hot'), cf. *to take red-handed* in English

Further semantic developments of HOT IS IMMEDIATE are also possible: both *harjača linija* 'hotline' and its metonymic extension *harjačyj dzvinok* 'hot call' are related to emergency communication.

The metaphor HOT IS RECENT is expressed in several Ukrainian idioms that originated from hunting terms. Being contextual synonyms in (35), both *harjačyj* 'hot' and *svižyj* 'fresh' denote a very recent past in relation to the focal event. In fact, in literal expressions 'fresh' is synonymous to 'cool', as in *svižyj viter* 'cool wind' (see Table 5). When the scent is no longer intense or strong, the adjective *staryj* 'old' is attributed to it (cf. the English *cold scent*).

(35) *harjač-yj /*   *sviž-yj*   *slid*
      hot-M.NOM.SG /   fresh-M.NOM.SG trail:M.NOM.SG
      'recently left trail', cf. *blazing scent* in English

The intensity of temperature is also employed to indicate nearness in space, e.g. *ity po harjačyx slidax* 'to closely chase someone' (lit. 'walk along a hot trail'). A finely graded temperature scale including comparative forms and intensifiers is used to give directions as to closeness to or remoteness from an article to be discovered, especially in children's games (36)

(36) *Zovsim*   *xolodn-o* */tepl-iše*   */ tepl-o*   */ harjač-e /*
      completely cold-ADV / warm-ADV.CMPR /warm-ADV /hot-ADV /

      duše   harjač-e.
      very   hot-ADV

      'Someone is not close/closer/close/very close to finding or guessing
      something.'(lit. 'It is completely cold/warmer/warm/hot/very hot')

These contexts allow only temperature adverbs in the function of zero-valent predicates (cf. *Someone is cold/warm/hot* in similar English contexts). The conceptualisation of distance in (36) further extends to mental activity, as in guessing correctly or incorrectly.

Summing up, the intensity of work as well as the immediacy of action and proximity in space are conventionally interpreted in terms of temperature in Ukrainian. The hot zone is commonly activated and references to the cold zone are less consistent.

4.4   Temperature as the target domain

The range of mappings to temperature from other domains is quite limited. First and foremost, oppressive ambient and, colloquially, body temperatures are conventionally conceptualised as living beings, often beasts, as in *ljuty moroz* 'fierce frost', *dyka speka* 'wild scorching_heat'. Personified temperature nouns commonly function as the grammatical subject (37; also, see 38):

(37) a. *Spek-a*   *bje*   *rekordy*
          scorching_heat-NOM beat:PRS.3SG record:ACC.PL
          'Scorching heat is beating a record.'

      b. *Na druhyj den' sxopyv*   *yoho*   *žar-ø*   (O. Dončenko)
          on next   day grab:PST.PFV 3SG.ACC fever-NOM
          'He had a fever the next day.' (lit. 'Fever grabbed him the next day')

The polysemous *solodkyj* 'sweet' can be attributed to *teplo*, especially in the personal feeling sub-domain, as in *solodke teplo* 'sweet warmth', when an experienced temperature is agreeable to the senses.

The data show that temperature extensions in Ukrainian are engaged into cross-domain interplay both as the source and as the target. As the source, the temperature domain is commonly projected onto a range of experiences, from extensions to rather closely related domains which share quite a few semantic properties, like the skin sense of temperature and other perceptions, to more distant and semantically complex associations. As the target, the ambient temperature sub-domain is commonly conceptualised in terms of a living being. It is primarily Ukrainian adjectives and nouns referring to warming and cooling temperatures which are polysemous, idiomatically active and whose semantic derivation extends beyond temperature meanings. Temperature words denoting neutral value are limited to their literary meanings. Gradability among semantic extensions of temperature terms generally follows the strategies observable in the literal senses.

5.   Brief discussion

Although it was posited in previous theoretical research that the temperature domain has a one-dimensional conceptual structure because of "a single and consistent ordering" of its constituents (Langacker 1987:150) and that *hot* and *cold* occupy "analogous portions of the opposite sides of a scale" (Lehrer 2002:502), current typological studies show that temperature systems across languages are internally heterogenic "in that their different parts behave differently" (Koptjevskaja-Tamm 2011:408). Ukrainian is no exception.

Suggestively, modern Ukrainian actualises two sub-systems of temperature conceptualisation. The first sub-system is perception oriented. It is primarily represented by generic and specific temperature terms and their extensions in the language and it is ultimately grounded in our experience of natural entities as well as our bodies. Being essentially gradable this system is principally structured by a bidirectional SCALE image schema but its realisation in language is asymmetric, non-single dimensional and highly relational. Crucially, cold is predominantly conceptualised as the lack of warmth but the reverse is hardly the case.[13]

The intensity of temperature is unevenly expressed across the sub-domains. It tends to range from fine-grained continual gradations for immediately experienced and/or constantly changing temperatures to discrete categorical oppositions for types of things and states associated with given temperatures. Continual gradations are likely to contain an explicit mid-interval although its markedness may vary depending on the temperature sub-domain or even particular collocates. The temperature terms opposed to each other in conventional contexts are more likely to have the mid-interval

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13.   Cf. the view of the concept of fire as a point of reference for verbal representations of hot, warm and cold objects and surroundings in Wierzbicka (1996:221–224).

lexically unmarked and they are also less likely to form comparatives and superlatives or be used with intensifiers. Depending on the speaker's intentions, each temperature term can be contrasted with more than one antonym either in the same or in the opposite zone of the spectrum. Overall, the correlation between lexemes and the temperature values they refer to within this sub-system is not clear-cut, up to the point where opposite temperature terms name the same temperature condition or one and the same lexeme refers to opposite temperature values. However, there is no logical contradiction there, when different aspects of the same state are highlighted (e.g. in (16a) the focus is on high temperature and in (16b) the focus is on shivering) or when desired and not actual temperatures are referred to (e.g. "this beer is warm" and "this tea is cold" (13), though both drinks are of room temperature). Also, the intensity of the quality perceived is more important than the quality itself, when the same temperature terms are attributed to both oppressive heat and oppressive frost (see Section 3.1) or when a person's state is expressed as a wide temperature swing (32).

Semantic and grammatical parallels between the ambient and the personal-feeling sub-domains suggest that in addition to the SCALE, they both are co-structured by the CONTAINER image schema. Indeed, outdoors, indoors and clothes "contain" the experiencer's body, whereas the body is a "container" of temperature, caused by either external or internal factors (cf. Goddard & Wierzbicka 2007: 775–776). Also, the BOUNDARY between the EXTERNAL ambient and the INTERNAL personal-feeling sub-domain can be crossed, as in the idiom (38):

(38)   *Xolod-ø   do kistok   projmaje*
       cold-NOM to bone:GEN.PL penetrate:PRS.3SG
       'The cold (outdoors) is getting to (my) bones.' cf. *frozen to the bone* in
       English

Unlike other entities, temperature evaluation of the body also activates the PART-WHOLE image schema. Indeed, feeling temperature in the whole body (14a) vs. in its part (14b) is a relevant distinction in both the personal-feeling and touch sub-domains, whereas temperature evaluation of other entities is more likely to be holistic.

The conventionality of now grammaticalised impersonal predication in the sub-domains of ambient and personal-feeling temperature may imply that both external and internal temperature conditions may be seen as imposed on the experiencer from the outside and that he or she has no control over the situation. At the same time, temperature nouns functioning as the grammatical subject in an active clause can represent either a state or a personified agent, often with its further metaphorisation as a living being or a supernatural force.

On the other hand, the substantivisation of temperature adjectives, which is characteristic of the touch-temperature sub-domain, emphasises "thingness" and thus the accessibility and closeness of the physical entities implied. Suggestively, the touch sub-domain presumes a direct contact with a SURFACE of the entity evaluated.

The spatiality of temperature expression becomes even more salient in the metaphorical uses (36) co-structured by the NEAR-FAR image schema. Overall, linguistic data suggest that the perception based sub-system of temperature expression is predominantly conceptualised in terms of HORIZONTALITY and that it recurrently realises the experiential content of two or more conceptual structures at once.

The second sub-system is a much later socio-cultural development. On top of perceptual knowledge of temperature it is also imparted by our experience with the thermometer, which results in the co-occurrence of the SCALE and the UP-DOWN image schemas, as in (6), (17) and before. It is feasible to consider that the second sub-system is motivated by metonymy, since the measurement scale of the quality represents the quality itself. Its VERTICALITY can be either bidirectional with a zero midpoint (6) or bounded at one end by the negation of the quality (17b). This sub-system is employed when more accurate statements about temperature are required, yet it is conventionally restricted to expression of ambient and body temperature. Only the perception based sub-system is used to talk about touch temperature in everyday language, as in "this stone is hot" but not "*the temperature of this stone is high". When interchangeable, these sub-systems are sensitive to registers, with the one grounded in the thermometer being more formal than the other.

The axiological dimension dominates linguistic expression of temperature in both literal and figurative uses. However, the temperature vocabulary does not exemplify a single evaluative scale, which neither parallels the intensity of the quality addressed nor is consistent across the whole domain. Suggestively, temperature evaluation is motivated by the dichotomy of the embodied experience and climatic and cultural norms. Indeed, extreme temperatures tend to be negatively connoted and warmth is associated with physical and emotional comfort. Yet stems referring to oppressively high temperatures gain positive evaluation, when they are related to enthusiasm or passion and "warm winter" (3a) or "warm beer" (13a) are unwelcome because they deviate from the norm.

In addition to experiential conceptualisations the linguistic system of temperature expression in Ukrainian is structured by the CENTER-PERIPHERY image schema with a clearly defined lexical and morphosyntactic centre, which also points to the fundamental asymmetry of the Ukrainian temperature domain.

6.   Conclusion

The linguistic temperature domain in Ukrainian is evidently salient. States and properties related to temperature perception are expressed primarily via adjectives, de-adjectival adverbs and nouns. The minimal basic distinction between warming and cooling temperatures is made with three central adjectives and parallel adverbs derived from them across all the sub-domains of temperature evaluation, with the

most typical syntactic contexts including attribution and predication. However, only two out of three central (generic) stems are conventionally lexicalised as nouns, one for both 'heat' and 'warmth' and the other for 'cold'.

Other temperature stems variably correlate with particular word classes and syntactic constructions, depending on their morphosyntactic and lexical properties as well as stylistic restrictions. They asymmetrically cover the sub-domains of temperature evaluation. The specification of neutral temperature is limited to the touch sub-domain. It can be lexicalised either as the adjective or as the noun depending on the syntactic context, and it refers to water. Lexicalisation of temperature terms as verbs of state is limited to personal-feeling 'cold'-predications in Ukrainian. Nouns are primarily used in, although not exclusive to, expressions of ambient temperature.

The Ukrainian sub-domains of ambient and touch temperature are more lexically and syntactically elaborated in comparison with those for personal-feeling temperature. Adjectives used for ambient temperature outdoors as well as adjectives and nouns applied to water exemplify finely graded temperature scales in Ukrainian. At the same time, usage of adverbs shows lexical and syntactic parallels in the sub-domains of ambient and personal-feeling temperature. Also, adjectives and nouns referring to warming and cooling temperatures are commonly more polysemous and idiomatically active, as compared to other relevant word classes.

Observable lexical and morphosyntactic variation coupled with inconsistency in the expression of temperature gradability and in the evaluation of temperature intensity as well as differences manifested in groupings of image schemas among the temperature sub-domains indicate linguistic and conceptual internal heterogeneity of the temperature system in Ukrainian.

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