

Guidelines for collecting linguistic expressions for temperature concepts: Version 1 (December 2007)

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These guidelines consist of three parts:

1. the Questionnaire/checklist, pp. 1 – 6
2. the Appendix with definitions for various terms, criteria for identifying phenomena and other practical information, pp. 7 – 15, and
3. the Background, providing the general description of the linguistic temperature domain and the main goals of the whole cross-linguistic project, pp. 16 – 24.

Questionnaire/checklist

Language:

Informant / language expert:

Date:

Q0. Listing tasks

Please list all the temperature expressions in your language that you can come up with. Provide their approximate translations into English.

Q1. Properties (the origin, meaning(s) and grammatical properties) of the individual temperature terms

The next step will be to check the various properties, including the exact meaning / use and grammatical properties for each of these expressions, going through each of the sub-domains (tactile temperature, non-tactile temperature, personal-feeling temperature, “extended temperature”) and possibly adding new temperature expressions. For answering many of the questions you are kindly asked to consult the Appendix and the Background, which contain definitions for various terms, criteria for identifying phenomena, and general information on things of relevance and interest. Please provide as many examples as possible.

Q1.0. Origin

Q1.0.1. Morphological structure: is X (relatively) morphologically simple or derived? If derived, please specify its internal structure and – whenever possible – give an account of its origin and semantic development.

Q1.0.2. Degree of nativization: is X a native, a nativized or a clearly borrowed, foreign expression?

Q1.0.3. Designation: is X only or primarily used for temperature evaluation, or does it apply to temperature only secondarily (cf. *warm* and *mild* about weather)? In the latter case, please specify the primary use (cf. Q1.4.3.).

Q1.1. Tactile temperature (“touch temperature”): evaluation of other entities’ temperature, based on perception received by the skin.

Q1.1.1. Can X refer to tactile temperature at all? [See A1 in the Appendix and 1.1.1 in the Background]

Q1.1.2. Uses and morphosyntactic properties of X. [See A1.1. in the Appendix and 1.2. in the Background]

Q1.1.2.1. In what syntactic functions does X occur in reference to tactile temperature (predication, modification, reference)?

Q1.1.2.2. In what syntactic constructions does X occur in these functions? Are these restricted to this word or to temperature words in general, or are they common for a larger group of words (or a whole word class)?

Q1.1.2.3. What grammatical properties does X have in these functions? Are these restricted to this word or to temperature words in general, or are they common for a larger group of words (or a whole word class)?

Q1.1.3. Concrete temperature meaning and combinability

Q1.1.3.1. Which entities can be evaluated by X? [See A1.2. in the Appendix and 1.1.1. and 1.1.4. in the Background]

Q1.1.3.2. How can the “concrete” temperature meaning of X be described / what temperatures can X refer to? [See B in the Appendix and 1.3.1. in the Background]

Q1.1.3.3. Does X in these uses allow degree modification and / or comparison (“very X”, “not so X”, “more X than...”)?

Q1.2. Non-tactile temperature: evaluation of particular circumstances (primarily a certain place at a certain time) or of entities by human beings with respect to whether they make them feel warm, cold etc. (i.e., temperatures that in one or another way affect one’s personal-feeling temperatures). This covers mainly ambient temperature, but also clothing temperature.

Q1.2.1. Can X refer to non-tactile temperature at all? [See A2 in the Appendix and 1.1.2 in the Background]

Q1.2.2. Uses and morphosyntactic properties of X. [See A2.1.1. and A2.2.1. in the Appendix and 1.2. in the Background]

Q1.2.2.1. In what syntactic functions does X occur in reference to non-tactile temperature (predication, modification, reference)?

Q1.2.2.2. In what syntactic constructions does X occur in these functions? Are these restricted to this word or to temperature words in general, or are they common for a larger group of words (or a whole word class)?

Q1.2.2.3. What grammatical properties does X have in these functions? Are these restricted to this word or to temperature words in general, or are they common for a larger group of words (or a whole word class)?

Q1.2.3. Concrete temperature meaning and combinability

Q1.2.3.1. Which entities can be evaluated by X? [See A2.1.2. and A2.2.2. in the Appendix and 1.1.1. and 1.1.4. in the Background]

Q1.2.3.2. How can the “concrete” temperature meaning of X be described / what temperatures can X refer to? [See B in the Appendix and 1.3.1. in the Background]

Q1.2.3.3. Does X allow degree modification and / or comparison (“very X”, “not so X”, “more X than...”)?

Q1.3. Experiencer-based, “personal-feeling” temperature: a subjective experience, caused by external or internal conditions (*I am cold because the room is not sufficiently heated vs. because I am having a fever*), or by a combination of both.

Q1.3.1. Can X refer to personal-feeling temperature at all? [See A3 in the Appendix and 1.1.3 in the Background]

Q1.2.2. Uses and morphosyntactic properties of X. [See A3.1. in the Appendix and 1.2. in the Background]

Q1.2.2.1. In what syntactic functions does X occur in reference to tactile temperature (predication, modification, reference)?

Q1.2.2.2. In what syntactic constructions does X occur in these functions? Are these restricted to this word or to temperature words in general, or are they common for a larger group of words (or a whole word class)?

Q1.2.2.3. What grammatical properties does X have in these functions? Are these restricted to this word or to temperature words in general, or are they common for a larger group of words (or a whole word class)?

Q1.2.3. Concrete temperature meaning and combinability

Q1.2.3.1. Which entities can be evaluated by X? [See A3.2. in the Appendix and 1.1.4. in the Background]

Q1.2.3.2. How can the “concrete” temperature meaning of X be described / what temperatures can X refer to? [See B in the Appendix and 1.3.1. in the Background]

Q1.2.3.3. Does X allow degree modification and / or comparison (“very X”, “not so X”, “more X than...”)?

Q1.4. “Extended temperature”: temperature terms used outside the (concrete, physical) temperature domain, in various metaphors (‘warm words’, ‘hot arguments’) or applied to other perceptual modalities (‘hot spices’, ‘warm colour’, ‘mild winter’).

Q1.4.1. Does X have uses outside the temperature domain at all? [See A4 in the Background]

Q1.4.2. Extended temperature meanings and combinability

Q1.4.2.1. Which entities can be evaluated by X?

Q1.4.2.2. How can the “extended” temperature meaning of X be described?
/ what temperatures can X refer to? [See B in the Appendix and 1.3.1. in the Background]

Q1.4.3. Uses and morphosyntactic properties of X.

Q1.4.3.1. In what syntactic functions does X occur in “extended-temperature” uses (predication, modification, reference)?

Q1.4.3.2. In what syntactic constructions does X occur in these functions? Are these restricted to this word or to temperature words in general, or are they common for a larger group of words (or a whole word class)?

Q1.4.3.3. What grammatical properties does X have in these functions? Are these restricted to this word or to temperature words in general, or are they common for a larger group of words (or for a whole word class)?

Q1.4.4. Direction of semantic derivation: which of X’s uses do you consider primary – reference to the concrete temperature domain or the others (cf. Q1.0.3)?

Q3. Relations among the temperature terms

Q3.1. (Quasi-)synonymy: are there temperature terms that have (relatively) similar meaning and can therefore be considered (quasi-)synonyms? If yes, in what way(s) do they differ from each other (e.g., according to various sociolinguistic parameters, showing collocational differences, etc.)?

Q3.2. Categorical (non-)distinctiveness: are there temperature expressions such that the denotation of the one is subsumed under that of the other (cf. Swedish *het* ‘hot’ that can always be replaced by *varm* ‘≈warm, hot’ which has no upper limit)?

Q3.3. Antonymy: what temperature terms can be considered antonyms to each other (cf. 1.3.2.2. in the Background)? A suggested procedure – two naming tasks:

Q3.3.1. The naming task “antonyms in isolation”: list opposites/antonyms for every temperature term

Q3.3.2. The naming task “antonyms with respect to their semantic range”: list opposites/antonyms for every temperature term restricted to a particular kind of temperature evaluation and to a particular group of entities

Q3.4. Salience: which of the temperature terms are the most salient ones, i.e. are the

first ones that come to mind when people are asked to list temperature expressions and/or to think about temperature?

Q3.5. General knowledge: which of the temperature terms are generally known in the whole speech community and are used in a more or less uniform way across it? Which ones are restricted by various sociolinguistic parameters?

Q3.6. Frequency: which of the temperature terms frequently occur in actual usage and/ or are frequently named when people are asked to list temperature expressions and/or to think about temperature?

Q3.7. Basicness: Is it possible to distinguish the set of prototypical basic terms that are (i) salient; (ii) generally known in the whole speech community, with their meanings generally agreed on; (iii) native or at any rate nativized; (iv) morphologically simple or at any rate non-compositional; (v) specialized for this particular domain or at any rate, if shared with other domains, primarily used for this domain; (vi) within this domain not-too-restricted in their application and (vii) not subsumed under other terms?

Q4. General characteristics of the temperature terms

In this section you are invited to make generalizations on the meanings and grammatical properties of the whole temperature system in your language, based on the answers to the earlier sections. The main questions here are as follows:

Q4.1. Lexicalization of temperature concepts, categorization within, or “carving up” the temperature domain: What temperature concepts are encoded as words in your language, what semantic distinctions are made in its systems of temperature terms and what factors underlie them?

Q4.2. Lexicon-grammar interaction within the temperature domain: How are temperature concepts lexicalized in your language in terms of word classes? What syntactic constructions are used for talking about temperature perception?

Q4.3. Semantic derivation and motivation (patterns of polysemy and semantic change) relevant for the temperature domain: What are the possible semantic extensions of the temperature meanings to other domains and how can these be related to their concrete meanings? Where from do the temperature terms come? How can the meaning of the temperature terms change within the temperature domain itself? What general metaphorical and metonymical models underlie the semantic evolution of the expressions related to the temperature domain?

<i>Any suggestions for improving this questionnaire are welcome!</i>

Thank you for your kind assistance!

Maria Koptjevskaja-Tamm

APPENDIX

A. Concrete uses: kinds of temperature evaluation, syntactic functions, relevant entities

1. Tactile temperature (“touch temperature”): evaluation of other entities’ temperature, based on perception received by the skin.

1.1. TYPICAL SYNTACTIC CONTEXTS

PREDICATION

- (7) *The soup's too HOT.*
The water had a TEMPERATURE of 75 C.
The pan is HOT on the handle.

MODIFICATION / ATTRIBUTION

- (8) *He touched the HOT pan and started shrieking of pain.*

REFERENCE

- (9) *Be sure to insulate yourself from the cold of the snow.*

1.2. RELEVANT ENTITIES

Natural environment

Natural surfaces with which a human being's feet, hands and body in general come in contact (while walking, sitting, standing or lying)::

sand
 rock / stone(s)
 earth
 lava
 ash
 ...

Water in various natural conditions:

water in a lake, river, sea...
 river
 lake
 sea
 spring
 ...
 rain

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*Air, *wind [cf. also with 2.1.2.1.]

Ice, snow [constantly cold entities]

*Fire, *bonfire [constantly hot entities, cf. also with 2.1.2.2.]

Household and man-adapted environment

Man-made surfaces with which a human being's feet, hands and body in general come in contact (while walking, sitting, standing or lying):

floor (of various quality and material, e.g. wooden, carpet, stone...)
 metal surfaces: roof
 furniture (of various quality and material)
 ...

*stove, *fireplace, *radiator [cf. also with 1.2.1.4]

Kitchen utensils with which a human being's hands come in contact:

kettle, frying-pan, pan ... (often used for heating things)

jug, cup, plate, glass...

...

a (smoothing-)iron

...

Water in household [cf. also drinks / food below]

water for washing babies

water for washing different kinds of clothes

water for washing hands, face ...

water in different water taps

water taps ('hot' – 'cold')

shower

bath

...

Drinks / food

The 'hot'-'cold' opposition

hot dish(es) – cold dish(es)

hot food – cold food

hot drinks – cold drinks

hot hors-d'oeuvres – cold hors-d'oeuvres

...

Drinks / food to be consumed hot / heated

tea, coffee...

soup

pasta, potatoes

...

Drinks / food to be consumed cold on purpose / chilled

beer, champagne, vodka...

ice-cream

...

Drinks / food that can be consumed cold or under varying temperature conditions

drinking water

bread

milk

fruit

...

Household environment:

Fire [a constantly hot entity]

1.3. Meaning

2. Non-tactile temperature: evaluation of particular circumstances (primarily a certain place at a certain time) or of entities by human beings with respect to whether they make them feel warm, cold etc; temperatures that in one or another way affect one's personal-feeling temperatures.

2.1. Ambient temperature – the temperature in a certain environment (determined by time and place). It can be reasonable to distinguish between Outdoor temperature (2.1.2.1), and Indoor temperature (2.1.2.2)

2.1.1. TYPICAL SYNTACTIC CONTEXTS*PREDICATION*

- (1) NON-REFERENTIAL PREDICATION: No “real” subject for the temperature expression

It's too HOT to do anything today.

QUASI-REFERENTIAL PREDICATION

- (2) “Weather”, “climate” as the subject

The weather is too HOT today.

- (3) Place as the subject

Rome is pretty HOT this time of year.

- (4) “Air”, “wind” as the subject.

The wind coming from the Sahara is HOT.

- (5) “The sun” (etc.?) as the subject.

The sun at this time of the day was really HOT.

The sun was BURNING HOT.

- (6) Time as the subject

Last Tuesday was a real SCORCHER.

Last Tuesday was really HOT.

ATTRIBUTION

- (7) “Weather”, “climate”

Older people need to sleep in cool and comfortable conditions in the HOT weather.

- (8) Place

These plants cannot grow in HOT places.

- (9) “Air”, “wind”

The HOT wind flows toward low pressure over the Pacific Ocean.

- (10) “The sun”

When in the HOT sun to stay cool is it better to wear white or black?

- (11) Time

It is dangerous to have a fire on a HOT day.

REFERENCE

- (12) Many old people in Paris ~~were killed by~~ the ~~died of~~ HEAT in 2003.

2.1.2. RELEVANT ENTITIES

2.1.2.1. Outdoor temperature:

Geographical places:

Typically uninhabited places:

mountain

volcano

forest

desert

steppe

plain

field

cave

...

open place

shadow

...

Inhabited places:

village: general and / or proper name

town / city: general and / or proper name

country: general and / or proper name

...

Time:

day

night

morning

afternoon

evening

week

month

year

period

hour

seasons (winter – spring – summer – fall; dry period – rain period, etc.)

...

Weather:

weather

climate

...

Outdoors conductors of heat

air [cf. also with 1.2.]

wind [cf. also with 1.2.]

(snow / sand-)storm

Environmental sources of heat (real or imaginary)

the sun

the moon (???)

stars (???)

...
[Also fire, cf. 2.1.2.2.]

2.1.2.2. *Indoor temperature*

Places

house
room
sauna [and other places that can be hot on purpose]
cellar [and other places that can be cool or cold on purpose]
refrigerator

...

Sources of heat

*fire, *bonfire [cf. also with 1.2.]
*stove, *fireplace, *radiator [cf. also with 1.2.]
(electric) fan

...

[Also air, cf. 2.1.2.1.]

2.2. Clothing temperature – the effect of clothing etc. on the personal-feeling temperature of human beings (i.e., whether the clothing may keep one warm in a cold weather, make one feel cool in a hot weather, etc.). **Clothing** is reminiscent both of **places** that keep one warm or make one feel cool, [on the other hand](#), and of **sources of heat**, [on the other hand](#).

~~[on the other](#)~~

2.2.1. TYPICAL SYNTACTIC CONTEXTS

PREDICATION

(13) *The sweater was WARM when it needed to be.*

ATTRIBUTION

(14) *I need a WARM sweater.*

REFERENCE?

2.2.2. RELEVANT ENTITIES

Clothing:

sweater
jacket
trousers
mittens
boots

...

Bed (clothing):

bed
blanket
plaid

3. Experiencer-based, “personal-feeling” temperature: a subjective experience, caused by external or internal conditions (*I am cold because the room is not sufficiently heated* vs. *because I am having a fever*), or by a combination of both.

3.1. TYPICAL SYNTACTIC CONTEXTS

PREDICATION

- (1) *I am / feel HOT.*
- (2) *I am FREEZING.*
- (3) *U menja nogi MERZNUT (Russian) – lit. ‘I have my feet FREEZING’*
- (4) *I am COLD in my feet.*

ATTRIBUTION

- (5) *???A cheap wetsuit will result in a poor fit and a COLD child.*
- (6) *Will you warm a FREEZING child?*

REFERENCE

- (7) ?

It can be expected that personal-feeling temperature evaluation occurs most frequently in egocentric contexts, i.e. with reference to “I”, the 1st person pronoun. This can also be grammaticalized (or conventionalized) to various degrees, so that a language can use different constructions (including different lexical items) for describing personal-feeling temperature in the ego vs. in other persons.

3.2. RELEVANT ENTITIES

Living beings

- people (child, woman, man, old person...)
- animals (dog, cat, horse...)

Body-parts (hands, feet, ears...)

B. Concrete uses: meaning

The following checklist might be of help for understanding the meaning of a temperature term. Remember that the suggested values / parameters / meanings can be relevant for all or only a subpart of the kinds of temperature evaluation (tactile vs. non-tactile vs. personal-feeling temperatures) and for all or only a subset of the possible syntactic functions.

The “basic distinction” is between warming temperatures, cooling temperatures and neutral temperatures. There might be further distinctions within both the warming and the cooling temperatures. Neutral temperatures, on the other hand, do not always get lexicalized.

1. WARMING TEMPERATURES (‘WARM’ AND ‘HOT’)

- **Warming temperatures in general**, i.e. any temperatures that feel warm or hot (e.g., Swedish *varm*)

A few canonical contexts:

- (1) I touched the kid’s forehead – it was X.

Possible readings:

- a. ‘The kid had a normal temperature.’
- b. ‘The kid had a fever.’

- (2) The water in the sink is X.

Some possible readings:

- a. 'The water is quite ok if you want to wash your hands in it.'
- b. 'The water is too hot: you cannot wash your hands in it because you will burn yourself.'

(3) The water in the lake is X.

(4) The coffee is X = 'it has the right temperature'

(5) The fire is X.

(6) The day is X / I feel X.

Possible readings:

- a. 'The day is warm (and nice) / I feel warm (and nice).'
- b. 'The day is hot (and difficult) / I feel hot (and uneasy).'

• **Pleasantly warming temperatures** that correspond to or are not significantly higher than the temperature of the human body/skin or that maintain the temperature of the human body (e.g., *teplyj* in Russian)

A few canonical contexts:

(1) I touched the kid's forehead – it was X.

Possible readings:

- a. 'The kid had a normal temperature.'
- *b. 'The kid had a fever.'

(2) The water in the sink is X.

Some possible readings:

- a. 'The water is quite ok if you want to wash your hands in it.'
- b. *'The water is too hot: you cannot wash your hands in it because you will burn yourself.'

(3) The water in the lake is X.

(4) The coffee is X = 'it does not have the right temperature and is therefore undrinkable'.

(5) *The fire is X.

(6) The day is X / I feel X.

Possible readings:

- a. 'The day is warm (and nice) / I feel warm (and nice).'
- *b. 'The day is hot (and difficult) / I feel hot (and uneasy).'

• **Temperatures that are higher than pleasantly warming ones without necessarily being dangerous** (Russian *gorjachij, zharkij*; Eng. *hot*)

A few canonical contexts:

(1) I touched the kid's forehead – it was X.

Possible readings:

- *a. 'The kid had a normal temperature.'
- b. 'The kid had a fever.'

(2) The water in the sink is X.

Some possible readings:

- a. 'The water is quite ok if you want to wash your hands in it.'
- b. 'The water is too hot: you cannot wash your hands in it because you will burn yourself.'

*(3) The water in the lake is X.

(4) The coffee is X.

Possible readings:

- a. 'The coffee has the right temperature.'
- b. 'The coffee is too hot for drinking.'

(5) The fire is X.

(6) The day is X / I feel X.

Possible readings:

- *a. 'The day is warm (and nice) / I feel warm (and nice).'
- b. 'The day is hot (and difficult) / I feel hot (and uneasy).'

- **Uncomfortably, dangerously high** temperatures (Swedish *het*)

A few canonical contexts:

(1) I touched the kid's forehead – it was X.

Possible readings:

- *a. 'The kid had a normal temperature.'
- b. 'The kid had a fever.'

(2) The water in the sink is X.

Some possible readings:

- a. *'The water is quite ok if you want to wash your hands in it.'
- b. 'The water is too hot: you cannot wash your hands in it because you will burn yourself.'

*(3) The water in the lake is X.

(4) The coffee is X

Possible readings:

- *a. 'The coffee has the right temperature.'
- b. 'The coffee is too hot for drinking.'

(5) The fire is X.

(6) The day is X / I feel X.

Possible readings:

- *a. 'The day is warm (and nice) / I feel warm (and nice).'
- b. 'The day is hot (and difficult) / I feel hot (and uneasy).'

- **Others? E.g., not sufficiently warm for the norm, etc.**

2. NEUTRAL TEMPERATURES

- **Temperatures that are not felt as either warm or cold, “neutral” temperatures** (e.g., *lukewarm* in English, *ljum* in Swedish)

3. 'COLD', 'COOL', 'CHILLY'

- **Cooling, chilling temperatures in general**, i.e. any temperatures that feel chilly or cold; temperatures that are **low** (lower than the norm) or that do not maintain the temperature of the human body, but chill it (Russian *xolodnyj*, Swedish *kall*)
- **Slightly cooling**, more cool than warm, chilly temperatures (Russian *proxladnyj*, Swedish *sval* and *kylig*)
- **Pleasantly cool(ing)** temperatures (Eng. *cool*)
- **Cool(ing) temperatures** that are slightly too cold to be pleasant (Eng. *chilly*)
- **Rising vs. falling** cooling temperatures, i.e. cooling temperatures that are higher vs. lower than those they are compared to (e.g., *doux* vs. *frais* in French)
- **Unpleasantly, dangerously cold temperatures**
- **Others? E.g., not sufficiently cold for the expected temperature**

1.4. OTHERS

- **temperature that is lower or higher than the expected temperature** (e.g., Japanese *nurui*)
- **temperature of the heat generated by the sun** (Russian *znojnyj*).

Background: talking about temperature across languages

0. The goals of the project

The main general issue dealt with in the project is the conceptualisation of temperature in natural languages as reflected in their systems of central temperature terms, such as *hot*, *cold*, *to freeze*, etc. The project is intended to lead to an integrated lexical-typological study of the temperature domain across a number of genetically, areally and structurally diverse languages with the aim of describing and accounting for the cross-linguistic variation within it from three different angles (research topics):

Lexicalization of temperature concepts, categorization within, or “carving up” the temperature domain

What temperature concepts are encoded as words across languages, what distinctions are made in the systems of temperature terms and what factors underlie them? Are there universal temperature concepts? Can temperature terms and temperature term systems completely freely ~~to~~-vary across languages, or are there limits to this? How can the meanings of temperature terms be described (e.g., via reference to the objective temperature scale, to the human body and human perception or to typical entities, like fire or ice)?

Lexicon-grammar interaction within the temperature domain

How are temperature concepts lexicalized across languages in terms of word classes? What syntactic constructions are used for talking about temperature perception?

Semantic derivation and motivation (patterns of polysemy and semantic change) relevant for the temperature domain

What are the possible semantic extensions of the temperature meanings to other domains and how can these be related to their concrete meanings? Where from do the temperature terms come? How can the meaning of the temperature terms change within the temperature domain itself? What general metaphorical and metonymical models underlie the semantic evolution of the expressions related to the temperature domain?

1. General description of the linguistic temperature domain

1.1. Kinds of temperature evaluation

Temperature perception in humans involves two types of universal experience:

- temperature sensation / evaluation of the temperature of other entities, based on perception received by the skin, and
- thermal comfort (keeping the body’s temperature at 37°C).

Each experience has its own scale with its own reference point – the neutral zone surrounding physiological zero vs. the comfort zone, the latter dependent on the normal habitat of each particular group of people.

When we talk about temperature perception / evaluation, we can distinguish three main sub-domains (frames) with further distinctions.

EXPERIENCE-BASED (whereby an entity has a temperature that can be verified from “outside”):

- TACTILE-TEMPERATURE, or “TOUCH-TEMPERATURE”
- NON-TACTILE TEMPERATURE

EXPERIENCER-BASED (whereby an entity, i.e. a living being, experiences a certain state):

- PERSONAL-FEELING TEMPERATURE

These notions will now be clarified and exemplified for predicative uses of temperature expressions (e.g., *The kettle is COLD* rather than *the COLD kettle*). Note that here we are discussing stative situations, as opposed to (inchoative) processes whereby an entity acquires a certain temperature (*The house has COOLED OFF by a few degrees*) and (causative) actions whereby an agent changes the temperature of an entity (*We CHILLED the drinks on ice*) – cf. 1.3.3.

1.1.1. TACTILE TEMPERATURE, “TOUCH-TEMPERATURE”, is exemplified in (1):

(1) *The floor / the kettle / the soup is COLD.*

Human beings normally evaluate tactile temperatures of entities by touching them with (various parts of) their bodies, e.g., with their feet while walking or standing on them, or with their bodies while sitting or lying on them (*the floor*), with their hands while holding or just touching them (*the kettle*), or with their mouth while eating them (*the soup*). The bulk of the more sophisticated methods of temperature evaluation (thermometers etc.) involve an elaboration of the touching methodology. In addition, there are, of course, more indirect ways of evaluating an entity’s temperature: a steam rising from a plate of soup is an indicator of the soup’s high temperature, while a layer of ice on a rock signals that the rock is cold, or even freezing. But this, again, builds on our previous touching experience.

1.1.2. NON-TACTILE TEMPERATURE with further distinctions is exemplified in (2) and (3):

(2) *AMBIENT TEMPERATURE:*

a. **Non-referential:** *It is COLD here.*

b. **“Quasi-referential”:** *The weather / Moscow / Winter / The sun is COLD.*

(3) *CLOTHING TEMPERATURE:*

a. **Non-referential: (???)** *It is COLD in this sweater.*

b. **“Quasi-referential”:** *This sweater is COLD.*

Non-tactile temperatures refer to evaluation of particular circumstances (primarily a certain place at a certain time) or of entities by human beings with respect to whether they make them feel warm, cold etc. This applies, first of all, to the temperature in a certain environment, either outdoors or indoors (*AMBIENT TEMPERATURE*, cf. *It is cold in Moscow in January* vs. *It is cold in this room*), but also to the *CLOTHING TEMPERATURE* (*This sweater is cold*). Although, strictly speaking, skin (and, consequently, tactile perception) is also involved here, this is hardly conceived of as primary or important, which justifies the label “non-tactile temperatures”. What matters here is the real or potential effect of such temperatures on one’s personal-

feeling temperatures (cf. 1.1.3.).

AMBIENT TEMPERATURE can be construed as a state within a certain environment and expressed as a predicate that does not require any arguments (zero-valent predicate) or, at least, no “real” arguments apart from the place-holder *it* and its correspondences (e.g., Russian *xolodno* ‘cold-N.SG’ and its English translation *It is cold*) – these are **non-referential** ambient temperatures. AMBIENT TEMPERATURE can also be construed and expressed as evaluation of various entities, or referents, both abstract and concrete – weather, place, time, the sun, etc. (cf. ex. (2b)) – these will be called “**quasi-referential**” ambient temperatures. CLOTHING TEMPERATURE is normally “quasi-referential”, since it is construed as a property of a particular clothing item; non-referential CLOTHING TEMPERATURE is exemplified in (3a).

1.1.3. EXPERIENCER-BASED, or PERSONAL-FEELING TEMPERATURE is exemplified in (4):

(4) *I am COLD.*

PERSONAL-FEELING TEMPERATURE is a subjective experience, caused by external or internal conditions (*I am cold because the room is not sufficiently heated vs. because I am having a fever*), or by a combination of both.

1.1.4. Alternations in temperature evaluation

Some entities can receive different kinds of temperature evaluation, cf. below.

TACTILE / NON-TACTILE:

- **sources of heat** (e.g., stoves, radiators) can feel cold / hot when you touch their surfaces (TACTILE) or can be perceived as radiating too little (or no) heat / much heat (NON-TACTILE, AMBIENT);
- **heat-conductors** (e.g., air, wind) can feel cold / hot when coming in contact with particular body-parts, such as the skin of the face, arms, etc. (TACTILE) or can be perceived as making one cold / hot (NON-TACTILE, AMBIENT);
- **clothing items** (e.g., boots) can feel cold / warm if they have been standing outdoors on a cold winter day or in the sun on a hot summer day (TACTILE); they can also be cold / warm if a person wearing them feels cold / warm (NON-TACTILE, AMBIENT).

TACTILE / PERSONAL-FEELING:

- **living beings and their body parts** can occasionally alternate here. Thus, a child having a fever will feel hot to those who touch him / her (TACTILE), but will freeze, i.e. the child him-/herself will feel cold (PERSONAL-FEELING TEMPERATURE). A person can feel cold / freeze in his / her fingers (PERSONAL-FEELING TEMPERATURE), which might be discovered by other people via touching (TACTILE).

1.1.5. Examples of semantic definitions for *cold* in the format of the Natural Semantic Metalanguage (Goddard & Wierzbicka (2007))

TACTILE [F] *This thing (e.g. water, milk) is cold.*

this thing is like this:

if a part of a person’s body touches this thing,

 this person can feel something in this part of the body because of it

because of this, this person can know something about this thing
 because of this, this person can think like this:
 “something can’t be like this if a **short time before** it was in a place where
 there was **fire**[M]
 a person can feel something **bad** in part of their body if this part of the
 body touches something when it is like this”

AMBIENT [I] *It is cold in this place now.*
 this place is like this:
 if someone is in this place now this person can feel something in their body
 because of this, this person can know something about this place
 because of this, this person can think like this:
 “a place can’t be like this when there is **fire**[M] in it
 a place can’t be like this when the sun[M] above it is like **fire**[M]
 a person can feel something **bad** in their body when they are in this place
 because of it”

PERSONAL-FEELING [J] *I’m cold.*
 I feel something **bad** in my body now
 a person can feel something like this when they are in a place where it is cold[M]

1.2. Temperature concepts, word-class distinctions and syntactic constructions

Temperature expressions can be used for PREDICATION, MODIFICATION / ATTRIBUTION, and REFERENCE, cf. (5):

- (5) a. TEMPERATURE PREDICATION: *The night is COLD.*
 b. TEMPERATURE MODIFICATION: *You will need a warm blanket for COLD nights.*
 c. TEMPERATURE REFERENCE: *We suffered from the COLD of the night.*

Two main groups of interrelated questions pertain to the interaction between the lexical semantics of temperature expressions and their grammatical properties:

- How are temperature concepts lexicalized across languages in terms of word classes, and
- What syntactic constructions are used for talking about temperature perception?

Temperature terms can belong to different word classes, even within one and the same language – e.g., for English adjectives (*cold* in 5a-b), verbs (*to freeze*), nouns (*coldness, temperature*). Languages vary in their word-class attribution of temperature concepts: thus, for instance, many languages lack temperature adjectives.

Word-class attribution and, further, lexicalization of temperature expressions and the possible syntactic constructions in which they can be used are sensitive to their semantics and, most importantly, to their uses for the different kinds of temperature evaluation (TACTILE vs. NON-TACTILE vs. PERSONAL-FEELING TEMPERATURES). Languages vary as to how much these distinctions are reflected in the morphosyntax and / or in the lexical choice (cf. also Plank 2003). Table 1 presents a few simple examples of this variation for **predicative constructions** (with the exclusion of CLOTHING TEMPERATURES).

Table 1: Talking about ‘cold’ in English, German, French and Japanese.

	EXPERIENCE-BASED TEMPERATURE			EXPERIENCER-BASED, or PERSONAL-FEELING TEMPERATURE
	TACTILE-TEMPERATURE (“touch-temperature”)	NON-TACTILE-TEMPERATURE: AMBIENT		
		“quasi-referential”	non-referential	
English	<i>The stones are cold.</i>	<i>The wind is cold.</i>	<i>It is cold today.</i>	<i>I am cold.</i> <i>I am freezing.</i>
German	<i>Die Steine sind kalt.</i>	<i>Der Wind ist kalt.</i>	<i>Es ist kalt heute.</i>	<i>Mir ist kalt.</i> <i>Ich friere.</i>
French	<i>Les pierres sont froides.</i>	<i>Le vent est froid.</i>	<i>Il fait froid.</i>	<i>J’ai froid.</i>
Japanese	<i>Ishi ga (SUB) tsumetai.</i>	<i>Kaze ga (SUB) tsumetai.</i> <i>Kaze ga (SUB) (?) samui.</i>	<i>Kyô wa (TOP) samui.</i>	<i>(Watashi wa (TOP)) samui</i>

In all the cases English uses the same adjective *cold* in the same standard construction for predicative adjectives, but has in addition a verb *freeze* for EXPERIENCER-BASED TEMPERATURE.

German parallels English in having both an adjective for all the uses and a special verb for EXPERIENCER-BASED TEMPERATURE. However, it goes further than English in distinguishing between two predicative adjectives constructions – the standard (with the subject in the nominative case) and the experiencer (with the subject in the dative case) constructions (the latter being used in some other cases of experiencer-based predications).

French uses what looks like one and the same word, *froid*, in all the cases, but distinguishes among three different constructions. *Froid* is an adjective when used for TACTILE and “QUASI-REFERENTIAL” AMBIENT TEMPERATURES, which are expressed by the standard constructions for predicative adjectives. In the two other constructions *froid* is in fact a noun, which combines with the verb *faire* ‘do, make’ in constructions expressing NON-REFERENTIAL AMBIENT TEMPERATURES (similar constructions are used for other ambient states), and with the verb *avoir* ‘to have’ in constructions expressing EXPERIENCER-BASED TEMPERATURES (again, well in line with other experiencer-based predications).

Finally, Japanese combines the choice between two lexemes for ‘cold’ with the choice between two syntactic patterns. The adjective *tsumetai* is used for TACTILE and AMBIENT “QUASI-REFERENTIAL” TEMPERATURES as a predicate applying to a subject with the subject particle *ga*. AMBIENT NON-REFERENTIAL and PERSONAL-FEELING TEMPERATURE involve the adjective *samui* used in constructions involving the topic particle *wa* (typical of other ambient and experiencer-based predications). *Samui* can sometimes apply to AMBIENT “QUASI-REFERENTIAL” TEMPERATURES, but in the subject-based construction with the subject particle *ga*. Interestingly, well in line with some other experiencer-based predicates, personal-feeling temperatures can directly apply only to the first person experiencer. For all the other persons it is necessary to use derived forms with the general meaning of “to show sign of / to look like feeling cold, warm, etc”.

1.3. Linguistic categorization of the temperature domain

1.3.1. Parameters and values relevant for temperature evaluation

Languages differ as to how many temperature terms they have and how these categorize, or carve up each of the different temperature sub-domains or the temperature domain in general. We can assume that linguistic categorization of the temperature domain is sensitive to several parameters, that are important and salient for humans, can be distinguishable by simple procedures relating to the human body

and have only very approximate physical correlates. Some of the major ones are listed below.

A. Kinds of temperature evaluation (see 1.1.)

B. 1. "Basic distinctions"

- Warming temperatures
- Cooling temperatures
- Neutral temperatures (which are not felt as either warm or cold, e.g., *lukewarm* in English, *ljum* in Swedish)

2. Further possible distinctions within "warming" temperatures:

- "unpleasantly hot, burning, dangerous" vs. other temperatures (Swedish *het* vs. *varm*)
- "heat coming from the sun" (Russian *znojnyj*) vs. other temperatures
- "normal warming" (Russian *teplyj*) vs. other temperatures
- insufficiently warm for being pleasant, acceptable or the norm (for a particular entity or environment)

3. Further possible distinctions within "cooling" temperatures:

- "slightly cooling" (Russian *prokladnyj*) vs. other temperatures
- "slightly cooling, positive evaluation" vs. "slightly cooling, negative evaluation" (Swedish *sval* vs. *kylig*)
- insufficiently cool / chilly for being pleasant, acceptable or the norm (for a particular entity or environment)
- relative, i.e. rising vs. falling temperatures (e.g., temperatures that are cooler or warmer than earlier)
- "unpleasantly cold, dangerous cold" vs. other temperatures

An additional factor in lexicalization of temperature concepts is of a different nature:

C. Syntactic uses / Pragmatic functions

- predication
- modification / attribution
- reference

1.3.2. Relations among the temperature terms

1.3.2.1. Basic vs. non-basic temperature terms

There is a long tradition of distinguishing between basic and non-basic colour terms, and similar distinctions have sometimes been applied to temperature terms (e.g. Sutrop 1998, Plank 2003). Since the sets of criteria underlying the distinction vary among researchers and do not necessarily cluster, one binary opposition should rather be split into several distinctions, as follows.

KNOWLEDGE AND USAGE

Salience: the more salient terms are the first ones that come to mind when people are asked to list temperature expressions and / or to think about temperature

General knowledge: some of the terms are generally known in the whole speech community and are used in a more or less uniform way across it, while others are restricted by various sociolinguistic parameters

Frequency: the relative frequency with which temperature terms occur in actual usage and / or are named when people are asked to list temperature expressions and / or to think about temperature

SPECIALIZATION WITH RESPECT TO THE TEMPERATURE DOMAIN

Designation: some expressions are only or primarily used for temperature evaluation, whereas others apply to temperature only secondarily (cf. *warm* and *mild* about weather)

Collocational freedom: temperature expressions can be relatively free in applying to different classes of entities or restricted to a particular (sub)class (e.g., *haalea* ‘lukewarm’ is limited to liquids)

SEMANTICS

Categorical distinctiveness: temperature expressions can be categorically distinct from each other (cf. *cold* / *warm*); for others the denotation of the one is subsumed under that of the other (cf. Swedish *varm* ‘≈warm, hot’ which has no upper limit and can therefore subsume *het* ‘hot’)

ORIGIN AND STRUCTURAL PROPERTIES

Morphological structure: (relatively) morphologically simple or at least non-compositional vs. derived expressions

Degree of nativization: native or at least nativized vs. clearly borrowed, foreign temperature expressions

Prototypical “basic terms are (i) salient; (ii) generally known in the whole speech community, with their meanings generally agreed on; (iii) native or at any rate nativized; (iv) morphologically simple or at any rate non-compositional; (v) specialized for this particular domain or at any rate, if shared with other domains, primarily used for this domain; and (vi) within this domain not-too-restricted in their application” (Plank 2003); (vii) not subsumed under other terms

1.3.2.2. *Antonymy and gradability*

One and the same temperature term can have different antonyms that are not mutual synonyms (e.g., the antonyms of *warm* can be both *cold* and *hot*), and there are asymmetries in antonymy judgements for the temperature domain. This underlies the question of whether the temperature adjectives in a language are organized as points on one scale or whether they follow two different scales, one for hotness and one for coldness. In addition, lexical relations among temperature adjectives are to a high degree dependent on the entities they qualify. Thus, while the “default” antonym for *kall* ‘cold’ in Swedish is *varm* ‘warm’, the opposite to *kall öl* ‘cold beer’ is *ljummen öl* ‘lukewarm beer’ and not *varm öl*. The reason is clear: beer normally never reaches the temperature qualified as *varm*. One particular aspect of the dependency of antonymy among adjectives on the entity they qualify (their semantic range) is seen in conventionalised label pairs for opposite entities, e.g. *warm* vs. *cold courses, drinks*, etc., illustrated for Russian in Table 2 below.

Table 2: *xolodnyji* ('cold') and its opposites in Russian

	Antonym	Classes of entities	Russian examples
TACTILE USES	<i>gorjačij</i>	courses and drinks	<i>xolodnye vs. gorjačie bljuda, napitki</i>
	<i>teplyj</i>	only cold-blooded and warm-blooded animals	<i>xolodnokrovnye / teplokrovnye životnye</i>
NON-TACTILE USES	<i>žarkij, znojnyj</i>	Geographic spaces: desert, steppe, plain	<i>xolodnaja vs. žarkaja / zojnaja pustynja, step', ravnina</i>
	<i>teplyj</i>	indoors: peasant house jumper	<i>xolodnaja vs. teplaja izba * xolodnyj vs. teplyj sviter</i>

* A house or a part of a house which was not heated and could only be used in the late spring, summer and early fall vs. a house or a part of a house which was intended for winters and could therefore be heated.

An additional factor that is relevant for potential antonymical relations among temperature terms is gradability:

- some temperature terms allow degree modification and comparison (e.g., *very hot, hotter*)
- some temperature terms do not allow degree modification or comparison (e.g., **very lukewarm, ???more lukewarm*)

1.3.3. Additional temperature expressions and distinctions

Two additional kinds of situations or frames are relevant for the temperature domain:

- (INCHOATIVE) PROCESSES whereby an entity acquires a certain temperature (ex.5), and
- (CAUSATIVE) ACTIONS whereby an agent changes the temperature of an entity (ex. 6)

(5) *The house has COOLED OFF by a few degrees.*

(6) *We CHILLED the drinks on ice.*

Within each of these two overarching frames it is possible to make further distinctions along the lines suggested in 1.1. and 1.3.1.

1.4. Semantic derivation and motivation (patterns of polysemy and semantic change) relevant for the temperature domain

Temperature meanings are often semantically related to other meanings, either synchronically (within a polysemantic lexeme) or diachronically. Three types of semantic shifts are relevant here:

- **Transfield shifts from** the temperature domain: What are the possible semantic extensions of the temperature meanings to other domains? How can these be related to their concrete meanings?

As concepts rooted in basic and easily perceptible experiences, temperature concepts often serve as source domains for various metaphors ('warm feelings', 'hot news') and are extended to other perceptual modalities ('hot spices', 'warm colour').

- **Transfield shifts to** the temperature domain: From where do the temperature terms come?

Temperature meanings can develop from others, e.g., "prototypical" entities or activities with certain temperature characteristics ('burn, fire' > 'hot').

- **Intrafield extensions:** semantic shifts within the temperature domain itself

The meanings of temperature terms can also change within the temperature domain itself, e.g. ‘warm, hot’ > ‘lukewarm’, as in Lat. *tep-* ‘warm’, Sanskrit *tāpas* ‘heat’ vs. English *tepid* ‘lukewarm’, or the interesting cases of diachronic enantiosemy (opposite meanings) like Swed. *sval* ‘cool’ vs. German *schwül* ‘stiffy, unpleasantly warm’.

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