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# "Some like it hot"
# On the semantics of temperature adjectives in Russian and Swedish

Abstract
The paper focuses on the main temperature adjectives in Russian and Swedish, which are analysed and compared to each other on the basis of their combinability with nouns. Each of the two linguistic systems is strongly rooted in human experience of temperature. First, temperature attributes are chosen relatively to several temperature values or parameters, that are important and salient for humans and have only very approximate physical correlates. Second, physical objects differ considerably as to whether their remperature properties are ever registered by humans, or considered as important and worth mentioning, primarily depending on their function in the human life.

## 0. Introduction

The main general issue dealt with in the present paper is the conceptualisation of the temperature domain in natural languages as reflected in their systems of central temperature terms, such as the adjectives *hot*, *cold* etc. The paper focuses on two such systems, the temperature adjectives in Russian and Swedish, which are analysed and compared with each other. The important questions here include the following:

- What distinctions are made in such systems and what factors underlie them?
- How can the meanings of different temperature adjectives be described?
- What motivates the selective combinability of nouns with temperature adjectives?

Temperature terms have so far figured mainly in discussions of lexical fields, antonymy and linguistic scales. However, apart from SUTROP (1998, 1999; cf. also SHEN 1960, PRATOR 1963), on the whole there has been very little empirical work and descriptive generalisation in this domain, and, most importantly, nothing has been said yet on how the whole temperature domain can be divided by the temperature terms in a language

The structure of the paper is as follows. Section 1 provides the general background for the study. Section 2 contains a semantic comparison of the Russian and Swedish systems of temperature adjectives. Section 3 discusses nominal categorisation as it relates to temperature attribution and Section 4 touches upon the problem of lexical relations in this domain. The main conclusions of the paper are then summarised in Section 5.

## 1. Preliminaries

### 1.1. The method adopted in the present paper

The present study is based on a thorough analysis of possible combinations of the main Russian and Swedish temperature adjectives (*gorjačij* 'hot (tactile)', *žarkij* 'hot (non-tactile)', *znojnyj* 'hot (non-tactile) from the sun', *teplyj* 'warm', *proxladnyj* 'cool, chilly' and *xolodnyj* 'cold' for Russian; *het* 'hot', *varm* 'warm', *ljum* 'lukewarm', *sval*

'cool', *kylig* 'chilly' and *kall* 'cold' for Swedish – note that the glosses are only approximate) with various nouns. Combinability with temperature adjectives has been checked for 4,000 concrete nouns in the nominal database "Leksikograf. Predmetnye imena" (compiled by Raxilina and Krasil'ščik)(KRASIL'ŠČIK 1992).[1]

Methodologically we benefit above all from the approach to linguistic meaning that has been elaborated within the Moscow school of semantics (with Ju. Apresjan as the main figure, e.g. APRESJAN 2000), which is partly shared by Wierzbicka and strongly argued for in cognitive linguistics. It assumes that the combinability of a lexeme in different contexts, its "linguistic behaviour" (WIERZBICKA 1985), or "semantic range" (FIRTH 1957; MUEHLEISEN 1997) is normally motivated by its semantic properties and can provide cues for the understanding of its meaning, where the meaning of a word is its intension, rather than denotation, or extension. The semantic properties of every single lexeme are therefore to be studied individually, by a systematic analysis of its combinability. A semantic description of a lexeme includes both a description of its linguistic behaviour and a suggestion as to what semantic properties might motivate it.

Our study is restricted in several ways. First, it focuses only on attributive uses of temperature adjectives, i.e. on cases like "the warm day" rather than "The day is warm". This is due to our specific interest in the interaction between the semantics of temperature terms and that of the nouns they combine with. Modifiers can serve as indicators of the various properties semantically inherent in their head noun, since their meaning is more dependent on the semantics of their heads than the meaning of predicative adjectives that often realise properties having to do with the context rather than with the noun's intension. For Swedish, attributive uses of adjectives include the modifying first part in compounds according to the model "ADJECTIVAL STEM + NOUN", e.g. *en varmrätt* (*varm+rätt* 'warm+dish') 'a main course'. Moreover, we will discuss only concrete "physical" temperature to the exclusion of other uses of temperature adjectives such as "cold wrath" and "hot music".

Ideally, we should also have taken into account both the actual and possible situational and linguistic context for each of the attested combinations, but a consistent application of this principle would have made our task insurmountable. Thus, we will not discuss **when** the speaker chooses to qualify a nominal by a temperature adjective and say "hot coffee" instead of "coffee". Here we are more interested in whether the combination "hot coffee" is used at all under more or less normal circumstances. However, whenever an attested combination requires a special context, we comment on this.

Our study does not contain any statistics on the number of co-occurrence examples or on the number of informant judgements. We did, however, make a special point of

[1] The data come from dictionaries (primarily MAS 1981; BAS 1949–1965; SAOB 1898–1993; SOB 1986), text corpora (the Uppsala Russian corpus, http://www.slaviska.uu.se/korpus.htm, SUK, http://www.ling.su.se, the various text corpora at the Swedish Language Bank, http://spraakbanken.su.se), extensive searches on the World Wide Web for both languages, various literary sources, our own judgements and judgements collected by asking other native speakers.

checking and rechecking adjective-noun combinations that were either missing completely or very infrequent in our corpora, or those which occur with low frequency nouns. The questions to the informants were formulated both as "Which of the combinations 'cold beer', 'tepid beer', 'cool beer', 'chilly beer', 'warm beer', 'hot beer' do you think are possible and what would they mean" and "Is it possible to say 'lukewarm beer'? If yes, what would that mean? If no, what do you think this depends on?"

1.2. Temperature sensation vs. thermal comfort

Temperature perception in humans involves two types of experience. In HENSEL's (1981: 168) words, "[t]emperature sensation is a rational experience that can be described as being directed towards an objective world, as expressed by the statement: 'It is cold.' Thermal comfort is an emotional or affective experience referring to the subjective state of the observer as expressed by the statement: 'I feel cold.'"

Temperature sensation and evaluation of the temperature of other entities is based on perception received by the skin relatively to its temperature (normally 33°C–34°C) by means of receptors for cold and those for warmth. Thermal comfort has to do with keeping the body's temperature more or less constant at 37°C. Whereas temperature sensation is normally "local" and restricted to a certain part of the skin, thermal comfort is crucial for survival.

Each of these two types of experience has its own temperature scale with its own reference point. A neutral zone (normally 31-36°C) does not trigger any temperature sensations; these temperatures, consequently, feel neither warm nor cold. The centre of this zone, physiological zero, normally corresponds to skin temperature at 33°C, but can shift significantly due to sustained thermal adaptation to other temperatures (which partly explains the "subjectivity" of temperature terms, frequently mentioned in linguistic literature). Comfort zones are "those thermal conditions in which the majority of people will feel most comfortable" (EDHOLM, 1978: 51). The comfort zone for each particular group of people is very restricted, to a span of 3-4°C, and seems to be closely related to the temperature to which the group is habitually exposed. Most importantly, temperatures creating thermal comfort are normally significantly lower than the neutral temperatures perceived via temperature sensation.

1.3. The anthropocentricity of linguistic temperature evaluation

Temperature concepts are based on temperature perception of external reality and, as such, are shaped by our bodies and brain. The linguistic meanings of the corresponding terms, like linguistic meanings in general, have a strongly perspectival nature (GEERARTS 1997: 8). That is, they do not objectively reflect the external world, but rather offer a naïve picture of it, permeated with various folk theories which are based on people's experience and rooted in their culture. Restrictions on adjective-noun combinability can obviously be viewed from two opposite sides: those for the adjectives will be used for describing their meanings (Section 2); those for the nominals will help us to reconstruct the Russian and the Swedish linguistic views on

temperature properties of the nominal concepts (Section 3). The key notion here is anthropocentricity, which, for the temperature domain, means at least two things.

First, we suggest that temperature attributes are chosen according to several parameters, which are important and salient for humans and are distinguishable by simple procedures relating to the human body. All these parameters have only very approximate physical correlates and are in addition subject to variation (Section 2).

Second, the "naïve" picture of the world offered by the language involves not the physical objects themselves, but rather their linguistic "images". These linguistic images, in turn, can have various temperature properties or be "temperature-less", which is to a certain degree determined by the physical temperature properties of the objects they denote. However, a much more important factor here is the functions of the corresponding objects in human life (Section 3).

## 2. A semantic comparison of the Russian and Swedish systems

The following list shows the main Russian and Swedish temperature adjectives with their approximate English equivalents and their relation to warming / neutral / cooling temperature perception. The ensuing discussion will elucidate the extent to which this representation does not do justice to the complexity of the two systems.

| Russian | Swedish | | |
|---|---|---|---|
| *gorjačij, žarkij*, *znojnyj* | *het* | HOT | Warming |
| *teplyj* | *varm* | WARM | |
| | *ljum* | LUKEWARM | Neutral |
| *proxladnyj* | *sval, kylig* | CHILLY, COOL | Cooling |
| *xolodnyj* | *kall* | COLD | |

Fig. 1: The main temperature adjectives in Russian and Swedish (simplified)

### 2.1. Tactile vs. non-tactile temperature perception

The Russian temperature-adjective system differs strikingly from the Swedish one in having three different adjectives for the highest temperatures. The main difference between *gorjačij* and *žarkij* /*znojnyj* is close to the difference between temperature sensation and thermal comfort: entities characterised as *žarkij* make human beings feel hot, e.g. *žarkij den'* 'hot day', *žarkij ogon'* 'hot fire'. However, neither hot tea nor a hot shower, which both make you feel very hot and contribute to your temperature regulation, are qualified as *žarkij*, cf. *gorjačij čaj* 'hot tea', *gorjačij duš* 'hot shower'. What is at stake here is HOW temperature evaluation is accomplished, i.e. whether temperature is perceived directly, in a tactile way, by touching (*gorjačij*), or indirectly, in a non-tactile way, via the air *(žarkij, znojnyj*).

From a strict scientific point of view, the tactile vs. non-tactile opposition is not entirely justifiable, since all temperature perception involves skin receptors. However, what matters here is extent to which skin contact is foregrounded or salient in estimating temperature properties of an entity or whether it can be neglected altogether.

The only entities which can be more or less interchangeably described both as *gorjačij* and *žarkij* under the same circumstances are air and wind. The combinations *gorjačij vozdux* and *žarkij vozdux* ('hot air' in English) apply to the same extralinguistic situation, but describe partly different experiences and give rise to different pictures. In the former case one easily imagines the "burning" effect the air has on your skin (e.g., on the cheeks and the nose); in the latter case one imagines the effect the air has on you as a whole (e.g., how difficult it is to breath or how wonderful it is to skip heavy clothes). This behaviour of words for 'air and 'wind' is reasonable. Since we are always surrounded by air we do not think of it as being in contact with our skin. However, this contact can sometimes become more salient, for instance, when the skin itself is affected by very low or by very high temperatures.

Words for sources of heat and, marginally, clothes combine both with *gorjačij* and *žarkij*, but the resulting combinations mean different things in each case. *Gorjačaja batareja* ' a hot radiator, battery' and *gorjačie sapogi* ' hot boots' describe the temperature properties of their surfaces: they ARE hot themselves, they CONTAIN heat. In contrast, *žarkaja batareja* 'a hot radiator, battery' and *žarkie sapogi* 'warm (hot?) boots' refer to their properties of keeping people warm: they CAUSE you to feel hot. In other cases, *gorjačij* and *žarkij* show complementary distribution.

Many sources are not sufficiently powerful for producing such a high degree and intensity of heat that the air can conduct it. A burning candle is a too "weak" a source of heat to be described as *žarkij*. Even more interesting is the requirement that heating the air should be the main effect of an entity, rather than its side effect. Accordingly, neither kettles, nor boiling water, or lava can be qualified by *žarkij* – even though, a kettle with water that has been boiling for a long time radiates enough heat to be perceived via air.

Another peculiarity of the Russian system is the existence of a temperature adjective that unequivocally points to the source of the heat. Within the non-tactile high temperature terms, there is a distinction between temperatures of heat generated by variable sources (*žarkij*) vs. temperatures of heat generated by the sun (*znojnyj*).

2.2. Distinguishing extremely high temperatures

The Swedish distinction between varm and het is based on two parameters. On the one hand, the crucial point in the warming temperatures occurs at temperatures which are so high that they are uncomfortable and even dangerous for human beings – with temperatures above this point characterised as *het*. On the other hand, the distinction is optional: the temperature range of one adjectives (*het*) is included in that of the other one (*varm*).

*Varm* covers the whole range of sufficiently high "warming" temperatures – ranging from water in lakes and seas to heated tea. As pointed out in Section 1.2., temperatures creating thermal comfort are normally lower than the neutral temperatures perceived via thermal sensations. Consequently, the crucial point for the tactile *het* is higher than for the non-tactile *het*: while *het* can qualify the air at 35°C, it will be inappropriate when applied to tea at the same temperature. In compounds with *het* as the second

component, the high temperature gets even more intense as compared to just *het*, cf. *brännhet* 'burning hot' (< *bränn*a 'burn'), *kokhet* 'hot as boiling water' (< *koka* 'cook, boil') and *glödhet* 'glowing hot' (< *glöda* 'glow).

However, *varm* has no exact upper temperature limits and can therefore refer to temperatures covered by *het*, in particularly when combined with intensifiers such as "very" and "extremely". But even without intensifiers it is perfectly acceptable in contexts where such temperatures are described as dangerous, e.g. *Han fick problem med hjärtat i det varma afrikanska klimatet* 'He got problems with his heart in the *varm* African climate'. Body-part terms behave similarly. Thus, body parts are normally *varm*, as in *varma händer* 'warm hands' or *varma läppar* 'warm lips'. However, even higher temperatures, caused by illness, may be described both as *varm* and as *het*, e.g. *Doktorn kände på hans varma / heta panna* 'The physician touched his warm / hot forehead' where the difference is in emphasis, *het* is more expressive. The lower temperature limits for *varm* is, however, quite fixed (cf. Section 2.4.).

So in a sense *het* is optional: in all of its concrete uses it can be replaced by *varm*. It is normally used when the speaker wants to specify or emphasise the "hotness" of the entity, the fact that its temperature is higher than the normal warming temperatures. Recipes often recommend pouring *het buljong* 'hot bouillon' over something or doing something special with *het pasta* 'hot pasta', although the default temperature of both bouillon and pasta is *varm*. The negative connotations of danger for humans disappear in certain contexts, where the high temperatures appear enjoyable and desirable, cf. *en het bastu* 'a hot sauna'. *Hett te* 'hot tea' or *het soppa* 'hot soup' is obviously enjoyable for someone who is very cold. Such contexts can easily be multiplied, and no wonder – human beings sometimes enjoy the most unexpected things!

In contrast, the border between *teplyj* and the three "hot" adjectives in Russian is quite fixed and obligatory (cf. Secton 2.4.). Both *gorjačij* and *žarkij* cover a wide range of temperatures, from "pleasant" warming to unpleasant, dangerous burning ones. *Znojnyj*, on the other hand, has a pronounced negative connotation: it refers to temperatures which are definitely 'too hot' for causing feelings of comfort and can be described as 'spreading the strong heat of the sun and thus this weakening and exhausting human beings'. Thus, in the non-tactile sphere (to the exclusion of the tactile sphere), Russian is sensitive to the point at which high temperatures start being uncomfortable and dangerous**.** But, similarly to Swedish, the distinction even here is optional: there is no upper limit to the temperatures covered by *žarkij*, and *znojnyj* can be replaced by (*očen'* 'very') *žarkij* in all contexts. Note also that the heat of the sun in natural environments cannot reach extremely high temperatures.

2.3. Neutral, "normal" and warming temperatures

The Swedish system is sensitive to temperatures which are not felt as either warm or cold, "neutral" temperatures. This fairly well-defined and narrow range of

temperatures is covered by the adjective *ljum*[2], but is excluded from the temperature ranges of the other Swedish temperature adjectives (however, cf. below). For Russian this point is less crucial: it corresponds to the lowest limits of the adjective *teplyj*, but does not have any adjective of its own.

*Ljum* has a fairly restricted combinability with nominals and no emotive components per se. Combinations with *vatten* 'water' (both in household and in natural conditions including rain) are among the most frequent ones for *ljum*. The other frequent combinations refer to such drinks as *ljummen öl* 'lukewarm beer' and *ljummet kaffe* 'lukewarm coffee', which are clearly bad – the former is too warm and the latter too cold. Some food, however, can be enjoyable as *ljum*, cf. the following examples from the Swedish Language Bank Corpus: *Servera karrén med en* ***ljummen*** *potatissallad gjord på färskpotatis* 'Serve the loin (of pork) with **lukewarm** potato salad made of new potatoes' (from a recipe) and *Chokladkaka för samma pris är en ljuvlig****, ljummen*** *kladdig kakbit* 'Chocolate cake for the same price is a delicious, **lukewarm** sticky piece of cake' (from an advertisement).

When referring to the environment (air, wind, periods of time) and water in natural environments, *ljum* is clearly positive. Thus, *den ljumma luften/ vinden / natten* 'the warmy air / wind / night' or *sjöns ljumma vatten* 'the warmy water in the lake' give immediate and very pleasant associations.

The Swedish *ljum* is often used in those contexts where Russian will use *teplyj*. However, *teplyj* has a much wider applicability than *ljum* – both in terms of its temperature range (overlapping with the Swedish *varm*) and its combinability with nominals. We suggest that its meaning covers 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 without too much effort on the part of the human being and therefore cause an agreeable sensation of comfort and cosiness. Thus, *teplyj* covers temperatures that are "normal" with regard to the human body, that feel warm, but not exceedingly so. These are, of course, very close to "neutral" temperatures, which correspond to the temperature of the human skin or to the comfort zone. There are, however, important differences between *ljum* and *teplyj* that underlie our suggestion to describe their meanings (intensions) in different ways.

First of all, *teplyj* does have a clear "warming" orientation: an entity qualified by its comparative form (*bolee teplyj*, *teplee*) has a HIGHER temperature than the one it is compared to. *Ljum* often lacks this clear orientation: an entity qualified by its comparative form (*mera ljummen*, *ljummare*) can have either a HIGHER or a LOWER temperature than the one it is compared to. In the example *Hans öl är* ***ljummare*** *än min* 'His beer is **more lukewarm** than mine', the comparative form refers to the beer with a HIGHER temperature than the first one. In the example *Mitt te har svalnat,*

[2] A morphological peculiarity of this adjective is the strong forms *ljummen* in the common gender and *ljummet* in the neutral gender, which are preferred by many people (but not all) when reference is made to concrete temperatures, but may be used in metaphorical meanings as well. The corresponding regular forms *ljum* and *ljumt* are preferred in metaphorical uses, but, again, may occur in concrete uses as well.

*hans är ännu **ljummare*** 'My tea has cooled down, his is even **more lukewarm**', the comparative form refers to the tea with a LOWER temperature than the first one. In each case the comparative form points in the direction of the temperatures that do not feel either warm or cold. However, when referring to the environment (air, wind, day, etc.) the comparative form *ljummare* does point in the more warming direction.

Second, body-part terms are normally not qualified by *ljum*: Swedish informants either reject such combinations as **ljumma händer* 'lukewarm hands' or interpret them inconsistently and contradictorily. Also, associations with the human body normally lead to positive connotations in metaphorical uses. These abound for *teplyj* ,whereas *ljum* lacks any of these. Cf. *teplye slova, čuvstva, otnošenija* 'warm, positive, friendly words, feelings, relations' vs. *ljumma känslor, reaktioner* 'weak, neutral feelings, reactions'. These observations support the view that the meaning of *ljum* should not be described via direct reference to the human body, but is directly related to the absence of pronounced temperature perception within the neutral zone.

Restricted combinability of *ljum* with nouns (neither body-part names, nor words for indoor spaces, surfaces and clothes can combine with it) also follows from this: in most circumstances and for most entities temperatures that feel neither warm nor cold are not particularly interesting or salient. This can also account for the fact that *ljum* is often avoided and replaced by compounds with *varm* as the second, modified part when the corresponding temperatures are intended, are attained on purpose and / or are a positive constant characteristics of an entity. Recipes often mention *fingervarmt vatten* lit. 'finger-warm water', i.e. 'lukewarm water', since the standard Swedish procedure for checking whether water or another liquid has an appropriate temperature for dissolving yeast is by putting one's finger in it. Other frequent examples are *rumsvarmt smör* lit. 'room-warm butter', i.e. 'tepid butter', and *armbågsvarmt vatten* lit. 'elbow-warm water', i.e. 'water appropriate for bathing babies'. However, most importantly, "finger-warm", "room-warm" and "elbow-warm" are NO LONGER *varm*: "temperature-dropping" modification of *varm*, accomplished by compounding, pulls it out from the proper sphere of *varm* into the sphere of *ljum.*

The Russian *teplyj*, on the other hand, is almost unrestricted in its combinability and is allowed with entities of all those classes that can in general be qualified with respect to temperature, cf. *teplyj vozdux* 'warm air', *teplyj pesok* 'warm sand', *teplaja voda* 'warm water', *teplye ruki* 'warm hands', *teplaja kvartira* 'warm flat', *teplaja odežda* 'warm clothes', *teplaja pogoda* 'warm weather', *teplaja zima* 'warm winter'. The exceptions are expressions denoting human beings and other animals that are generally not compatible with temperature adjectives, apart from certain metaphorical uses. The other exceptions are designations for geographic spaces (e.g., 'forest', 'city') and for permanently hot or permanently cold entities ('boiling water' vs. 'ice').

On the whole, *teplyj* in Russian and *ljum* in Swedish describe temperatures within very limited temperature zones, even though the first one subsumes the other. Their reference can hardly be raised by intensifiers, such as "very" or "extremely": the temperature in *očen' teplaja komnata* 'a very warm room' is not significantly higher than that in *teplaja komnata*, and *očen' teplye ruki* 'very warm hands' does not imply

that the person has fever. The denotation is more or less the same with and without *očen'*, but there is a pragmatic difference: what is intensified is the evaluative component of cosiness, comfort and pleasantness. For *ljum*, intensification often emphasises the negative evaluation: both *väldigt ljummen öl* 'very lukewarm beer' *väldigt ljummet te* 'very lukewarm tea' are particularly disgusting.

2.4. Cooling temperatures: cold vs. chilly

The temperatures below the neutral zone are cooling temperatures. Both Russian and Swedish here distinguish between, on the one hand, 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*), and on the other hand slightly cooling, more cool than warm, chilly temperatures (Russian *proxladnyj*, Swedish *sval* and *kylig*). This distinction is probably the most subjective one of all those considered in the paper. It is also optional: it seems that *xolodnyj / kall* can replace the other cooling adjectives in most contexts.

The basic meaning of *xolodnyj* and *kall* is slightly modified when combined with words for different classes of entities. Thus, for sources of heat, such combinations mean not heating sufficiently (e.g., *xolodnoe solnce – den kalla solen* 'the cold sun') or either not heated sufficiently or having already got cold (*xolodnaja pečka – den kalla ugnen* 'the cold stove / radiator). The latter also applies to hot food and drinks (e.g., *xolodnaja baranina – kallt lamm* 'cold mutton'). Other food and drinks are, on the contrary, made cold on purpose, e.g. *xolodnoe pivo – kall öl* 'cold beer'. *Xolodnyj* / *kall* clothes do not protect against cold, and surfaces described in this way cool your skin. These adjectives have the broadest combinability of all the temperature adjectives.

Neither of the two systems has designated adjectives for extremely low temperatures. A step in that direction is provided by the Russian adjective *ledjanoj* derived from *led* 'ice'. It is most frequently used for reference to entities which are made of ice or which are covered with ice (cf. both meanings with the noun *gora* 'mountain': *ledjanaja gora* 'iceberg' and 'ice-run'). It can, however, also refer to very cold temperatures, but only perceived by touch and even there in a severely restricted fashion, e.g. *ledjanaja* voda 'ice-cold water', *ledjanoj veter* 'icy/freezing wind', but not **ledjanaja pogoda* 'ice-cold weather' or **ledjanaja odezhda* 'ice-cold clothes'. With body-part words, it can refer both to stiffness with cold, as in *Ja ne mogu igrat' passaži na rojale moimi ledjanymi pal'cami* 'I cannot play passages on the piano with my fingers which are stiff with cold', and to the low temperatures, as in *On menja stal dushit' svoimi ledjanymi rukami* 'He began strangling me with his ice-cold hands'.

The image of ice as a very cold entity is also evoked in the frequently used Swedish compound *iskall* 'ice+cold', i.e. 'ice-cold', whose combinability is similar to that of simple *kall* (cf. the similar intensification pattern for het in Section 2.3). Intensification in *iskall* and *ledjanoj* is often a matter of subjective evaluation: neither *iskallt te* nor *ledjanoj čaj* 'ice-cold tea' refers to tea whose temperature is approaching that of ice, but each conveys rather the speaker's exaggeration of its low temperature.

2.5. ‘Chilly’ and ‘cool’: positive vs. negative evaluation

Swedish, as opposed to Russian, is sensitive to the distinction between pleasantly cool(ing) temperatures (*sval*) on the one hand and cool(ing) temperatures, which are slightly too cold to be pleasant (*kylig*), on the other.

Thus, you will enjoy *en sval dag* (‘a cool day’), whereas on *en kylig dag* (‘a chilly day’) you run the risk of feeling cold if you don’t put on some extra clothes, and you might consider skipping a swim in a lake with *kyligt vatten* ‘cool water’ etc. However, neither *sval* nor *kylig* correlates with any precise temperature range and their choice is governed by individual preferences of speakers. One and the same day may be qualified as *kylig* by one person and *sval* by another (and even as *kall* by still another); also the same person can sometimes characterise an entity with the same temperature properties as *sval* and sometimes as *kylig* (and perhaps sometimes as *kall*). Thus, there are not necessarily objective correlates to the distinction *sval* vs. *kylig*. Subjectively, though, *kylig* is colder than *sval*, it covers temperatures just below the point where they are still pleasant. *Sval* is less restricted in combinability than *kylig*. The subjectivity factor applies, of course, to many cases of temperature attribution, but the choice between *kylig* vs. *sval* is, perhaps, an extreme case, since both adjectives cover more or less the same temperature range and apply to almost the same classes of entities.

*Proxladnyj* in Russian has an almost unrestricted combinability. Not infrequently it has positive connotations, but is in many situations quite neutral: you do not necessarily enjoy *proxladnoe leto* ‘a cool summer’, but, on the other hand, such a summer will not spoil your vacation.

Fig. 2 (overleaf) shows the Russian and the Swedish systems of temperature adjectives organised according to the parameters discussed in Subsections 2.1.– 2.5.

3. Adjective-noun combinability and anthropocentricity of temperature concepts

Temperature adjectives refer to fairly temporary and often momentary characteristics of entities. Consequently, they are sometimes more easily accepted as predicates than as attributes, which are primarily associated with more permanent states and properties. A classification of objects according to size or shape will have a good chance of remaining relatively stable for a long time, which makes them favourite parameters for being encoded in classifiers (Aikhenvald, 2000: 271–274), whereas a classification based on temperature properties will be subject to rapid changes. There is, however, a different side to nominal classification: not only what temperature properties an entity has at a particular moment, but also what temperature properties it may have in general. In other words, qualifiability by temperature attributes might be used as the basis for a classification of entities. Temperature qualification of nominals is partly determined by the physical temperature properties of the objects they denote: rivers cannot be hot and geysers cannot be cold. However, a more important factor here is the functions of the corresponding objects in human life. In short, depending on their function in human life, objects differ considerably as to whether their temperature is ever registered by humans, is considered as important and worth mentioning.

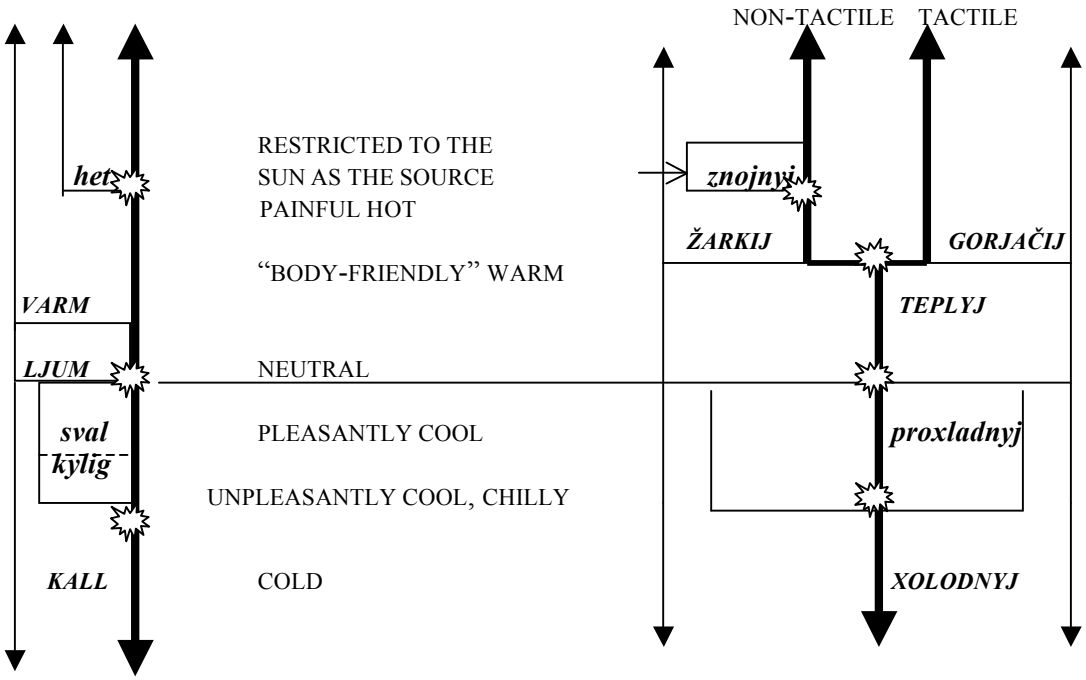



Fig. 2: the Russian and the Swedish systems of temperature adjectives (revised)
Legend: The size of the letters distinguishes adjective terms whose denotation is included in the denotation of others from those that are not replaceable (e.g., ***het*** vs. ***VARM***). Closed areas vs. arrows distinguish between adjectives covering a more or less defined range of temperatures vs. those that are unlimited.

Thus, while no one would find it strange to characterise a floor in terms of its temperature, which we immediately perceive when we walk on it barefoot, how often do we ever have a chance of estimating the temperature of ceilings? And even though we regularly touch books that we read, we normally do not reflect on their temperature: for a large portion of entities the temperature is an uninteresting background property, often predictable from the temperature of the surroundings. The temperature of boots is per se hardly interesting; what is interesting is whether they can keep our feet warm or not, in accordance with their normal functions in human life.

Here's a sketch of the "temperature view" on nominal classification (exemplified mainly by Russian).

First of all, there are permanently cold and permanently hot objects, such as ice and snow vs. fire, boiling water and geysers. Since their only temperature value is completely predictable, it could be hypothesised that representatives of these classes would not take any temperature attributes at all. However, examples of tautological qualification abound in our sources, in particular for *xolodnyj sneg / led – kall snö / is* 'cold snow / ice', but even *gorjačij kipjatok* / *gejzer* 'hot boiling water / geyser' are

attested on Russian-language www-pages. Semantically redundant temperature qualification has often a pragmatic effect of drawing attention to the property that may cause certain consequences, e.g. *Ligg inte i den kalla snön – du blir ju förkyld!* 'Don't lie in the cold snow – you will catch cold!' (Swedish). Contradictory qualification, on the other hand, often leads to metaphorical shifts in the interpretation of either the whole adjective-noun combination or parts of it. Thus, the title *Gorjačij sneg* 'Hot snow' of a well-known Soviet novel (by Jurij Bondarev) about the Second World War evoked the picture of intensive (hot) winter battles, with lots of hot blood in the snow.

Close to these classes are words for artefacts, which are made cold or warm/hot on purpose – food and drinks. Such names do combine relatively freely with temperature adjectives. However, a combination of an artefact word with a "wrong" temperature adjective suggests that there is something wrong with the artefact itself and has a pronounced negative value. *Teploe pivo* 'tepid beer', *teplyj sup* 'tepid soup' and *xolodnye makarony* 'cold macaroni' are all marginal and undesirable representatives for beer, soup and macaroni, hardly deserving the names themselves.

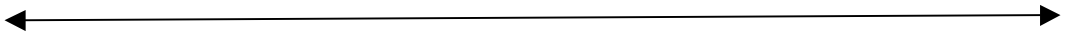
In Russian, words for metals – *stal'* 'steel', *čugun* 'cast-iron' etc., – as well as *steklo* 'glass' are normally qualified as cold. When qualified by *gorjačij* 'hot (tactile)', the same words refer to a different aggregation state of the same substance. *Gorjačaja stal'* would not refer, say, to steel which has become hot under the sun rays, but rather to steel heated in an oven, melted steel. Other temperature attributes do not apply to these words, e.g. $^{???}$*teplaja stal'* 'warm steel'.

Words for geographic spaces combine with temperature adjectives very selectively and, significantly, only with the " extreme" ones (cf. Section 4). *Gory* 'mountains' takes only *xolodnye* 'cold', and only in plural, while *pustynja* 'desert', *step'* 'steppe', *ravnina* 'plain', *savanna* 'savanne' can combine with *znojnaja, žarkaja* and *xolodnaja*, but not with *teplaja* 'warm, tepid' or *proxladnaja* 'chilly, cool'. Amazingly, the only temperature adjective allowed with *les* ' forest' and its various synonyms is *proxladnyj* 'chilly, cool': in the Russian linguistic picture of the world, forests can never be cold, warm or hot. In general, temperature attributes in Russian are allowed only for a very restricted set of words for geographic spaces. Thus, while *žarkij / xolodnyj gorod* 'a hot / cold city, town' is fine, neither villages, nor fields or meadows are ever qualified with respect to their temperature properties. 'Country', again, behaves in a slightly peculiar manner – temperature attributes refer to their climate as a more or less stable property, e.g. *žarkie / teplye / xolodnye strany* 'countries with a hot / warm / cold climate'.

The discussion above suggests that the "temperature" view on entities results in their classification according to a scale with two opposite poles – permanently cold and permanently hot entities. The entities belonging to the intermediate zone show the greatest fluctuations in temperature properties, whereas those at the extreme poles or close to them are relatively rigid. Fig. 3 on the next pages illustrates the suggested scale for Russian.

Finally, there is an enormous empty zone in the combinability of temperature adjectives, constituted by living organisms – people and animals. Temperature attributes applying to such words are used only in metaphorical meanings, even though

words for body parts easily attach temperature attributes. Thus, **xolodnyj rebenok* 'a cold child' is impossible, whereas e.g. *gorjačij lob* 'a hot forehead', *xolodnye ruki* 'cold hands', *proxladnye guby* 'cool lips' are fine.



| | | | | | |
|---|---|---|---|---|---|
| perman-ently cold entities: ice, snow | cold food / drinks, metals, glass, mountains | shadow forest | air, wind, periods of time, in-door spaces, surfaces, water in natural surroundings / household | hot food / drinks, sources of heat when in function, steppe | permanently hot entities: fire, boiling water |

Fig. 3: classes of entities as reflected by Russian temperature adjectives

Interestingly, words that normally belong to the same category in standard taxonomies often show significant differences in their ability to take temperature attributes. Cf. the behaviour of the three words *odejalo* 'blanket', *prostynja* 'sheet' and *poduška* 'cushion', all belonging to the taxonomic class of bedclothes, in table 1. This behaviour is actually well motivated by the function of these entities in daily life. Blankets, like clothes, help humans with their thermal comfort and the corresponding words combine with temperature attributes in the same way and with the same resulting meanings as words referring to boots or sweaters. Thus, *žarkoe / teploe / xolodnoe odejalo* means that the blanket causes people lying under it to feel hot, warm or cold respectively. Cushions are primarily surfaces that can maintain warmth. Sheets do not function as clothes, but cannot maintain warmth either and may have a nice cooling effect on humans. However, under certain circumstances wet sheets can be used in functions similar to those of compresses, which licenses such uses as *zavernut' X v gorjačuju / xolodnuju prostynju* 'wrap X in a hot / cold sheet'.

Table 1: combinability of words for bedclothes with temperature adjectives in Russian

| | *žarkij* 'hot, non-tact' | *gorjačij* 'hot, tact' | *teplyj* 'warm' | *proxladnyj* 'chilly, cool' | *xolodnyj* 'cold' |
|---|---|---|---|---|---|
| *odejalo* 'blanket' | + | - | + | - | + |
| *prostynja* 'sheet' | - | + | - | + | + |
| *poduška* 'cushion' | - | + | ? | + | ? |

4. Antonymy in the domain of temperature adjectives

Discussions of antonymy often raise the question of whether all the temperature adjectives in a language are organized as points on one scale (e.g. BOLINGER 1968, LEHRER 1970), or whether they follow two different scales, one for hotness and one for coldness (OGDEN 1967, CRUSE AND TOGIA 1995, SUTROP, 1998). The latter would explain why one and the same temperature term can have different antonyms that are not mutual synonyms, and why there are asymmetries in antonymy judgements. These

discussions often ignore the fact that lexical relations among temperature adjectives are to a high degree dependent on the entities they qualify – a point closely related to the discussion in the previous section. 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*. Here we will take one particular aspect of the dependency of antonymy among adjectives on their semantic range – conventionalised label pairs for opposite entities. Table 2 lists some of the most frequent conventionalised pairs of entities with opposite temperature characteristics in Russian.

Table 2: *xolodnyj* and its opposites

| | Antonym | Classes of entities | Russian examples |
|---|---|---|---|
| TACTILE USES | *gorjačij* | courses and drinks<br>water in household and corresponding taps<br>springs<br>treatment (e.g., of metals) | *xolodnye vs. gorjačie bljuda, napitki*<br>*xolodnaja vs. gorjačaja voda,*<br>*xolodnyj vs. gorjačij kran,*<br>*xolodnye vs. gorjačie istočniki,*<br>*xolodnaja vs. gorjačaja obrabotka* |
| | *teplyj* | only cold-blooded and warm-blooded animals | *xolodnokrovnye / teplokrovnye životnye* |
| NON-TACTILE USES | *žarkij, znojnyj* | Geographic spaces: desert, steppe, plain | *xolodnaja vs. žarkaja / znojnaja pustynja, step', ravnina* |
| | *teplyj* | indoors: peasant house<br>jumper | *xolodnaja vs. teplaja izba* *<br>*xolodnyj vs. teplyj sviter* |

* 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.

The tactile *gorjačij* covers a wide range of temperatures, from "pleasant" warming to unpleasant, dangerous burning ones. Therefore, it is *gorjačij* which is opposed to *xolodnyj*, i.e. to the lowest temperature pole, whereas *teplyj* appears somewhere in the middle of the temperature scale. Qualification by *teplyj* in such cases means something special: *teplaja voda* 'warm(y) water' is used for washing delicate clothes, *teplyj čaj* 'warm(y) tea' is either not enjoyable at all or serves special purposes (e.g., in diets). *Teploe moloko* 'warm(y) milk' is strongly associated either with babies enjoying *teploe materinskoe moloko* 'mother's warm milk', or with milk coming directly from a cow (*teploe parnoe moloko*). A real conventionalised opposition between tactile *xolodnyj* and *teplyj* is found in one area– in reference to cold-blooded and warm-blooded animals, *xolodnokrovnye / teplokrovnye životnye* – and this is, of course, expected if the human body serves as the norm for *teplyj*.[3]

In the non-tactile sphere, the main opposition for geographic spaces is between *xolodnyj* vs. *žarkij*, or even *xoldnyj* vs. *znojnyj*, whereas for indoor spaces and clothes

[3] However, for dramatic effects human blood is often described as *gorjačaja krov'*, e.g. this is what vampires normally drink and also what pours from injuries when someone is hit by an arrow etc.

(including beds), the opposition is between *xolodnyj* and *teplyj*. This difference is not accidental. Geographic spaces are not teleologically "adapted" for human beings and, in particular, are not meant to provide them with comfortable temperature conditions. They are often even hostile to human beings and when their temperature properties are mentioned at all, these are normally uncomfortable, extreme temperatures. The only exception, the quasi-lexicalised combination *teplye strany / kraja* 'warm countries /lands', a generalised reference to places with a warm and nice climate, is particularly often used in fairy tales: places with such permanent ideal temperature conditions hardly exist in the real world. Buildings and clothes, on the other hand, are made on purpose, primarily to create and maintain comfort for humans. Therefore, in the sphere of indoor spaces and clothes (including beds), the main temperature opposition is between *xolodnyj* and *teplyj*. For these categories *žarkij* will mean too much heat. A child may complain of her *žarkij sviter* 'hot sweater' wanting to take it off, and after a while in a *žarkoe kupe* 'a hot compartment' you run the risk of getting a headache.

In Swedish, however, *varm* is normally the only reasonable opposite to *kall* 'cold' when reference is made to pairs of entities opposed by their temperature properties, such as *kalla / varma rätter* 'cold / warm courses', *kallvattenskran / varmvattenskran* 'a cold / warm tap', etc. This is due to the association of *het* with uncomfortably and high temperatures. In a few cases of tertiary oppositions, *het* refers to the entity with the highest temperature and with a very specialised and rare distribution, e.g. *hetvatten* 'hot-water, water of a very high temperature and under a very high presseure, used in heating systems', and *heta källor* 'hot sources, geysers, e.g. on Iceland'.

A few recent studies on antonymy do take the semantic range of adjectives (primarily their combinability with nouns) seriously. While MUEHLEISEN (1997) requires that real antonyms share the same semantic range, WILLNERS (2001) questions this and suggests that overlapping / similarity in semantic range applies to word meanings and not to whole words. Thus, e.g., *tom* 'empty' and *full* 'full' in Swedish are antonyms in the CONTAINER meaning, such as 'the bottle is full / empty', but not in contexts appealing to the MEASURING-ROD meaning, such as 'full speed'. Translated into the domain of this study, the tactile and the non-tactile meanings / semantic ranges of *xolodnyj* 'cold' will have different antonyms with the corresponding semantic ranges. Finally, according to MURPHY'S (2003: 215) pragmatic approach to lexical relations, "any sets of words, given sufficient context, can serve as a contrast set". This section has shown that antonymy and semantic range are sensitive not only to different meanings of one and the same adjective, but also to more fine-grained distinctions stemming from the properties of different classes of entities themselves. In a way, each of the temperature adjectives in each of its meanings has a unique semantic range.

With this in mind, we would also like to question the issue of basic temperature terms. SUTROP (1998, 1999) uses collocational freedom together with morphological simplicity as his main criteria for recognising basic temperature terms in languages (as suggested in BERLIN 1969, basic terms, in addition, are not subsumed under other terms and are of frequent use). Whereas English has four basic terms (*hot, warm, cool, cold*), Russian ends up with only two: each of the three 'hot' adjectives has restrictions

on combinability, while *proxladnyj* is morphologically complex (derived from the Old Church Slavonic *proxlada* 'coolness', which, in turn, consists of the prefix *pro-* with no clear meaning and the root *xlad-* 'cold', cognate to the Russian *xolod* 'cold'). There is a need to make the reasoning more nuanced before it can be applied across languages with really interesting results. First, diachronic and synchronic derivability should be distinguished: in Modern Russian *proxladnyj* is morphologically not more complex than *xolodnyj*. Even more importantly, since all temperature terms show collocational restictions, collocational freedom is never complete, but rather gradable.

## 5. Conclusions and perspectives for further research

It is now time to summarise the main conclusions of this paper. We have analysed the concrete "temperature" meanings and uses of the main temperature adjectives in Russian and Swedish on the basis of their combinability with nouns. It has been argued that each of the two linguistic systems is to a high degree rooted in human experience of temperature. Language on the whole, and the linguistic domain of temperature in particular, is strongly governed by anthropocentricity. First, temperature attributes are chosen relatively to several temperature parameters, that are important and salient for humans, are distinguishable by simple procedures relating to the human body and have only very approximate physical correlates (cf. Section 2 for the details). Second, though physical objects normally have certain temperature properties, they differ considerably as to whether these properties are ever registered by humans, or considered as important and worth mentioning – and this primarily depends on the function of various entities in the human life. This is manifested in specificity of "temperature" view on nominal classification (cf. Section 3) and in the impact of different nominals on antonymy relations within temperature qualification (Section 4).

The comparison between the Russian and the Swedish systems illustrates the second important point of the paper – that languages can differ considerably in how they cut up the conceptual domain of temperature. Further cross-linguistic research on the temperature domain is definitely called for. In particular, the following perspectives for further work can be discerned here:

1. Addition of new temperature or modification of the suggested ones. At least two other parameters are already known from other languages: the distinction between rising and falling temperatures (e.g., *doux* vs. *frais* in French) and sensitivity to default temperatures (e.g., *nurui* in Japanese, SUTROP 1998), but there are certain to be others.

2. Interaction among the different parameters. While the distinction for tactile and non-tactile perception in Russian is salient for the 'hot' temperatures, a similar distinction in Japanese is most robust for the 'cold' temperatures (SHIMOTORI 2004).

3. Cross-linguistically frequent vs. rare systems and their areal and genetic distribution. Interestingly, even languages closely related to Russian and Swedish show remarkable differences in their uses of temperature adjectives, which often are cognates to the Russian or the Swedish ones. Cf. the distinction between various types of hors-d'oeuvres in some of the Slavic and Germanic languages:

| | | | | |
|---|---|---|---|---|
| **Russian** | *xolodnye* | *(*teplye)* | *gorjačie* | *zakuski* |
| **Polish** | *zimne* | *(*ciepłe)* | *gorące* | *zakąski* |
| **Czech** | *studené* | *teplé* | *(*horké)* | *předkremy* |
| **Bulgarian** | *studeni* | *tepli* | *(*gorešti)* | *ordjovri* |
| **Swedish** | *kalla* | *varma* | *(*heta)* | *förrätter* |
| **German** | *kalte* | *warme* | *(*heiße)* | *Vorspeisen* |
| **English** | *cold* | *(*warm)* | *hot* | *hors-d'oevres* |

To take another example, the consistent distinction between tactile and non-tactile temperature adjectives sets Russian apart not only from Swedish and the other Germanic languages, but also from the other Slavic languages.

A separate huge field of study involves cross-linguistically recurrent patterns of semantic extensions of temperature terms into other domains (for some examples cf. GOOSENS 1998; BERGSTRÖM 2002; KOPČEVSKAJA-TAMM AND RAKHILINA [RAXILINA] 1999; SHIMOTORI, 2004).

The linguistic domain of temperature is undoubtedly worth deep and broad studies with many fascinating cross-linguistic generalisations to be revealed in the future.

***Acknowledgements***

The present paper is a substantially revised version of Kopčevskaja-Tamm and Rakhilina [Raxilina] (1999). First, we would like to thank all the numerous people who have shared with us their intuition on the uses and meanings of temperature adjectives. We are also grateful to Brita Berman, Bernard Comrie, Bill Croft, Östen Dahl, Nick Evans, Staffan Hellberg, Torsten Leuschner, Carita Paradis, Frans Plank, Urmas Sutrop, Anna Vogel and Beatrice Warren, who have in various ways inspired our research and / or improved on its quality. Earlier versions of the paper have been presented in our talks at the departments of the Slavic languages and literature and of the Scandinavian languages, Stockholm University; at the linguistic departments of the Universities of Konstanz and Kiel; at the 8th International Conference on Cognitive Linguistics in Stockholm (1999) and at the 5th Biennial Conference of the Association of Linguistic Typology in Cagliari (2003). We have benefited a lot from the discussions on all these occasions. Alan McMillion has generously helped us by improving the English.

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