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Climate, temperature and polysemous patterns in French and Wolof

Loïc-Michel Perrin (LLACAN, CNRS-France)

The aim of this paper is twofold. First, it presents the system of predicative terms (adjectives and verbs) involving a notion of temperature in two languages: Wolof (Atlantic, Niger-Congo phylum) and French (Romance, Indo-European family). It then studies and compares patterns of polysemy displayed by these temperature terms in order to observe whether the cultural representations relating to perception of climatic temperature influence these patterns.

1. Introduction

This paper lies within the theoretical framework of the conceptual triad language-culture-cognition. It considers the hypothesis that the cultural representations which emerge from the perception of climatic temperatures may have an influence on the polysemous uses of words referring to temperature. The aim is to study the polysemous patterns observed in two languages selected on the base of their genetic and geoclimatic contrast: Wolof and French of France. Wolof is mainly spoken in Senegal and in Gambia (a country forming an enclave within Senegal). It is a Niger-Congo language belonging to the Atlantic sub-group. It is the vernacular language of the Wolof ethnic group and it is the major lingua franca spoken by over 80% of the Senegambian population. Senegal and Gambia are located on the Atlantic coast of the African continent and are characterised by a tropical climate (and even a desert climate in northern Senegal). French is a Romance language originally spoken in France, a country with a temperate climate. Nevertheless, it should be pointed out that French is also spoken in Senegal. It is indeed the language of Senegalese formal education and children start being taught it at six years old. French is also used by the Senegalese civil service. Because of their proximity, it is perfectly conceivable that French might exert an influence on Wolof. This problem cannot however invalidate our analysis because, even though French and Wolof share some polysemous patterns, there are differences between these two languages.

In order not to complicate this comparison, the analysis will be restricted to predicates referring to an evaluation of temperature degree, whether this concerns places, air masses or entities (living beings or objects). In other words, this study will only focus on verbs and qualitative adjectives used for qualifying temperatures (used as predicates as well as noun modifiers); temperature nouns will not be examined here.

After a short presentation of the cultural representations relating to the climatic temperatures for each of the two geo-linguistic areas (Section 1), I will begin with a presentation of the diverse words and expressions involving a notion of temperature built on the research methodology and findings in Koptjevskaja-Tamm & Rakhilina (2006) (Section 2). Then, based on the theoretical framework of polysemy (Section 3.1.), I will present the semantic patterns in which the notions of temperature occur for each of the two languages (Section 3.2.). Finally, I will put forward an analysis of these polysemous patterns in order to observe whether it is possible to discover a correlation between their semantic patterns and the cultural representations relating to the climate (Section 3.3.).

The various adjectives and verbs related to temperature presented in this study (as well as some of the examples) are taken from the dictionaries *Le Grand Robert de la Langue Française* (Rey 2011) and *Le Robert des synonymes, nuances et contraires* (Le Fur 2005) and Diouf (2003)'s Wolof-French dictionary, which also contains synonym and antonym cross-references. Most of the examples used to illustrate the different meanings of French terms were collected on the Internet. For Wolof, supplementary data were collected in Senegal, during three field trips.

2. Temperature, climate and cultural representations of climatic temperatures

2.1 Temperature perception, thermal comfort and socio-physiological consequences

Temperature perception results from two kinds of *sensory receptors* located on the surface of the skin. The first kind evaluates temperatures between 10° and 36°C, while the second evaluates temperatures between 30° and 45°C. This means that both kinds of receptors react simultaneously whenever the temperature on the surface of the skin is

between 30° and 36°C. Below 10°C or over 45°C, the temperature sensation becomes painful due to the stimulation of pain receptors, called *nociceptors*.

The concept of *thermal comfort* refers to the state of mind that expresses satisfaction with the surrounding thermal environment. It corresponds to the range of temperatures within which an individual feels comfortable. The more the perceived temperature is below this range, the colder we feel; the more the temperature is above this range, the hotter we feel. The need for an individual to be in a situation of thermal comfort, like the requirement for nutrition and air, is one of the most basic human needs. And whatever the living conditions and fashion, clothes and buildings reflect this requirement. Other climatic factors may affect temperature perception, such as relative humidity or air movement. For example, the same temperature is perceived as hotter when the percentage of humidity is high and colder when it is low.

It is therefore essential to distinguish the neural mechanisms (on the surface of the skin) that enable us to perceive temperature, the feeling of temperature according to thermal comfort and the ambient temperature perceived through clothes.

So-called “thermal comfort” (i.e. what counts as “pleasant temperature”) normally spans 4–5°C and is included in the range of 20–29°C, but may differ both among individuals and overall among groups of people. The main factor behind this variation among groups of people is the climatic environment (Burton & Edholm 1969: 1175–1179; Edholm 1978: 51). For instance, inhabitants of tropical countries show a lower sensitivity to heat than those living in countries of Europe. It is however never pleasant to endure temperatures that are very away from those which are physiologically tolerable.

2.2 Thermal comfort and cultural representations of climatic temperatures

From a cultural viewpoint, one can easily accept that the subjective representation of a social group toward the phenomenon of temperature depends on the average temperatures that this group experiences. So, the more these temperatures are different from the thermal comfort zone which characterises this group, the more these temperatures are experienced negatively. For instance, in Central France, the average annual temperature is around 9.5°C (Météo-France 2009). France is also characterised by a temperate climate involving four seasons (a hot and dry season, a cold and humid season and two intermediate seasons). So, for French people, the need for thermal comfort requires resisting the cold (by being obliged to wear warm clothes and to live in insulated houses equipped with heating systems) especially during the winter, which is also called *la mauvaise saison* (‘the bad season’). The only moment during which the French live with temperatures close to thermal comfort – that is to say without having to struggle against the climatic environment – is during the summer, *la belle saison* (‘the beautiful season’). In conclusion, concerning the relationship of climate and annual temperature, French people share representations which are more negative for cold than for heat, since the average temperatures they undergo are clearly below the degree of thermal comfort (see Figure 1).

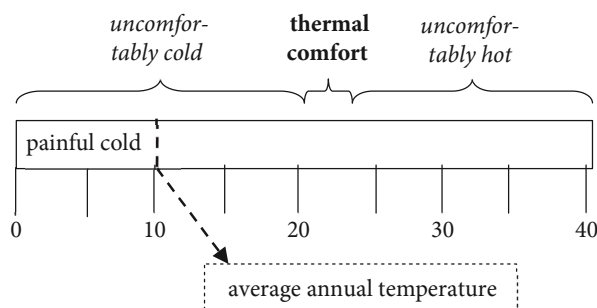


Figure 1. French culture and thermal comfort

On the other hand, Senegal is characterised by two seasons: a rainy season (called *nawet*) and a dry season (*noor*). The annual average temperature is around 25°C; but even during the rainy season, each day reaches a peak of heat (between 37° and 45°C) because of the blazing sun (Roux & Sagna 2000). The problem is not only the intensity of this peak of heat, but also its duration. Actually, it is the sun that controls the ambient temperature. Wolof has two different words for the sun: *jant*, which refers to the star (*jant bi fenk na* ‘the sun has risen’), and *naaj*, which refers to the heat (*naaj wi tàng na* ‘the sun is hot’). Thus, every day is hot in Senegal, and even more so from the end of the morning, which is also explicit in the polysemy of *naaj* (‘hot’ sun’ and ‘end of the morning’). The only cooler time of the year, from

December to January, at the beginning of the dry season, is really appreciated by the Senegalese, although they find the early mornings of this period (which never go below 17°C) to be unpleasantly cold. But the rest of the time, Senegalese people have to bear the heat.¹ They are still sensitive to irritability when the temperature increases. In consequence, since the temperatures they experience are generally higher than the degree of thermal comfort, Senegalese people tend to have a more positive opinion of cold than warmth (see Figure 2).

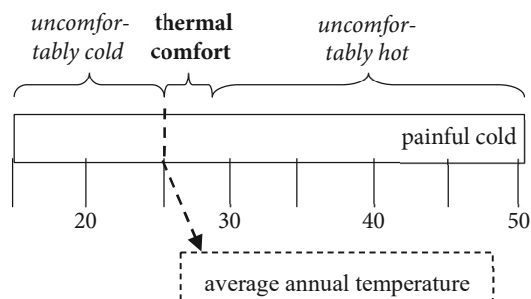


Figure 2. Senegalese culture and thermal comfort²

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To conclude, what a French and a Senegalese call 'cold' does not designate exactly the same temperature. Indeed, Senegalese people are not familiar with ambient temperatures below 17°C, which are equivalent to a relatively bearable cold temperature for the French. Therefore, it is definitely the apprehension of the variation of temperatures, according to thermal comfort, which is relevant.

3. Presentation of the systems

I now present the systematic organisation of temperature terms for each of the two languages to be compared. As has been mentioned previously, this analysis is restricted to the study of predicates (verbs as well as adjectives) used in a predication or a noun modification relating to qualifying temperatures.

There are no adjectives in Wolof (Perrin 2008: 182–183); there are only qualitative verbs (also called quality-verbs, e.g. *tàng* 'to be warm/hot'/'to feel warm/hot', *nugg* 'to be lukewarm'). French, in contrast, massively resorts to qualitative adjectives (e.g. *chaud* 'hot/warm') but can also use present or past participles (e.g. *brûlant* 'burning (hot)', *gelé* 'iced/frozen') and some verbs as well (*cailler* 'to curdle' and *geler* 'to freeze').

Among all these predicative terms, some of them are not typical temperature terms; and some develop their temperature reference only when they occur in particular syntactic constructions. For example, the French adjective *bon* 'good' only expresses a temperature reference when it occurs in an impersonal construction made up of the auxiliary verb *faire* 'to make': *il fait bon* 'it's (pleasantly) warm'. In the same way, the Wolof verb *liw* 'to feel cold, to be cold' can only explain a climate evaluation when it functions in an impersonal construction: *dafa liw* 'It's (really) cold'.

From a lexical viewpoint, I propose distinguishing between generic and specific temperature terms. Generic terms (e.g. the French adjective *chaud* 'hot/warm' or the Wolof quality verb *tàng* 'to be hot/warm'/'to feel hot/warm'), are linguistic units referring to the large range of temperature degree (in other words, the meaning of such terms is not very precise). On the other hand, *specific* temperature terms are those for which the reference to temperature degree is more precise (e.g. the French adjective *bon* '(pleasantly) warm' or the Wolof verb *saas* 'to be (very) hot').

3.1 The French lexical field of predicative terms relating to temperature

In French, there are 15 predicative terms (Table 1) including 9 qualifying adjectives: *chaud* 'hot/warm', *torride* 'torrid', *tiède* 'lukewarm', *doux* 'sweet', *froid* 'cold', *frisquet* 'chilly', *frais* 'fresh', *bon* 'good, (pleasantly) warm' and *glacial* 'freezing' (derived from the verb *glacer* 'to ice over'). There are also three participles that can function as qualitative adjectives. These are the present participles *brûlant* 'burning, burning hot' and *bouillant* 'boiling' (derived from the verbs *brûler* 'to burn' and *bouillir* 'to boil' respectively) and the past participle *glacé* 'iced (icy)' (also derived

¹ There is no appliance for lowering the temperature except air conditioning; but this is a recent innovation, and beyond the reach of most Senegalese.

² The range of 25°–29°C that is given here is a hypothesis. We have no exact measurement of the Senegalese thermal comfort zone. We just know that it is higher than the French range.

from the verb *glacer* ‘to ice over’) and *gelé* ‘frozen’ (from *geler* ‘to freeze’). Among the French temperature terms there are also two verbs, which both show a double syntactic functioning: *geler* ‘to freeze’/*se geler* ‘to freeze oneself (to be freezing)’ and *cailler* ‘to curdle (to freeze)’/*se cailler* ‘to curdle oneself (to be freezing)’.

Table 1. French predicative terms referring to temperature

	Ambient evaluation	Tactile evaluation	Personal feeling
Warm	<i>chaud</i>		
	<i>torride</i>		
	<i>brûlant</i>		
		<i>bouillant</i>	
	<i>bon</i>		
Neutral	<i>tiède</i>		
	<i>doux</i>		
Cold	<i>froid</i>		
	<i>frisquet</i>		
	<i>frais</i>		
	<i>geler/gelé</i>		<i>(se) geler/gelé</i>
	<i>cailler</i>		<i>(se) cailler</i>
	<i>glacial</i>		
	<i>glacé</i>		

Note that French resorts to the past participle *gelé* ‘frozen’ derived from the verb *geler*; whereas the past participle derived from *cailler* (*caillé*) is never used in the context of a temperature reference. It is also interesting to note that the participle functioning as a qualitative adjective *glacé* ‘iced’ involves a temperature reference, whereas the verb *glacer* ‘to ice over’ cannot be considered as a temperature term. And finally, just like the verbs *cailler* and *geler*, the adjective *bon* differs from the other adjectives in the sense that it refers to a temperature only when it occurs in an impersonal construction involving the auxiliary *faire* ‘to make’.

Five of the terms (*chaud*, *torride*, *brûlant*, *bouillant* and *bon*) may refer to warm temperature; two others (*tiède* and *doux*) refer to lukewarm, and the last eight terms (*froid*, *frisquet*, *frais*, *(se) geler/gelé*, *(se) cailler* and *glacé/glacial*) describe cold temperatures. Some of them, like *chaud*, *tiède* or *froid* are used for several types of evaluations whereas others, like *frisquet*, are only used for a specific one.

3.1.1 The three generic temperature terms

Among all these terms, three of them make explicit the three main zones of the temperature scale. These are *chaud* ‘hot/warm’, *tiède* ‘lukewarm’ and *froid* ‘cold’. The meaning of these terms is relatively wide; besides *chaud* and *froid* can refer to a disagreeable and even painful or dangerous temperature as well as a pleasant one. Further, these three adjectives do not have restrictions of usage depending on the frame of temperature evaluations (personal feeling, tactile perception and ambient perception), with the exception of the adjective *tiède* which cannot be used to express a personal feeling; in fact it is impossible to express a lukewarm temperature relating to a personal feeling in French. But the syntactic constructions in which these three terms occur are not the same; for instance, whenever the temperature adjective functions as a complement in a verbal predication, the relation between the qualified noun and this adjective is expressed (a) by means of the auxiliary *avoir* ‘to have’ in the case of personal feeling (Example 1), and (b) by means of the auxiliary *être* ‘to be’ in the cases of tactile perception (Example 2) and ambient perception (Example 3).

- (1) *C’est* *vrai que* *j’avais*³
 it be.pres.3sg true that I have.imperf.1sg

³ abbreviations: ante Anterior, aor Aorist, appl Applicative, cf Complement Focus, conn Connector, fut Future, fp Focus Particle, ideo Ideophone, imperf Imperfective, imper Imperative, neg Negation, oblig Obligative, papa Past Participle, perf Perfective, pl Plural, prep Preposition, pres Present, presco Present Conditional, presen Presentative, rel Relative marker, sf Subject Focus, sg Singular, vf Verb Focus, lit Literally.

chaud dans mes bottes de neige.

hot in my boots of snow

'It is true that I *felt hot* (had hot) in my snow-boots.'

- (2) *J' ai bien le droit,*
I have.pres.1sg really the right
en tant que mari, de dire que, pour moi,
as husband to say that for me
la soupe est trop chaude.

the soup be.pres.3sg too hot

'I am entitled, as a husband to say that, to my mind, this soup *is* too *hot*.'

- (3) *La cuisine de cette maison est bien froide.*
the kitchen of this house be.pres.3sg really chilly

'The kitchen of this house *is* really *chilly*.'

Besides, if the speaker wants to refer to the ambient temperature of a place (following an ambient perception), there is also the possibility of using an impersonal construction involving the auxiliary verb *faire* 'to make' followed by a temperature adjective (Example 4). This syntactic construction is actually typical of the reference to the ambient temperature of a place since it is compatible with most of the terms (whether adjectives or verbal participles) also used to describe this (see further).

- (4) *Qu' est- ce qu' il fait froid*

what be.pres.3sg it that it make-pres.3sg cold

dans cette cuisine!

In this kitchen

'How *chilly it is* (cold it makes) in this kitchen.'

Secondly, when the noun modifier occurs in a noun phrase as an attribute, and in the cases of tactile (Example 5) or ambient (Example 6) perception, the adjective appears in close proximity to the qualified noun (directly before or after), like any French qualitative adjectives.

- (5) *C' est du café chaud que vous buvez?*

it be.pres.3sg some coffee hot that you drink-pres.2pl

'Is it *hot* coffee that you are drinking?'

- (6) *Il faut moins d'énergie pour*

It take.pres.3sg less some energy to

Réchauffer une pièce froide que pour la chauffer constamment

warm.up a room cool than to it heat continuously

'It takes less energy to warm up a *cool* room than to heat it continuously.'

On the other land, this attributive construction is impossible in the case of a personal feeling expression (Example 7). One therefore has to resort to a verbal construction involving the auxiliary *avoir* 'to have' and insert it into a relative clause.

- (7) *Un homme qui a chaud doit*

a man who have.pres.3sg hot must-pres.3sg

avoir la fièvre.

have the fever

'A man who *feels hot* (has hot), must have a fever.'

Table 2 sums up these various syntactic constructions.

Table 2. Types of temperature evaluation and syntactic constructions in French

	verbal predication	noun phrase
Ambient perception	1. noun + <i>être</i> 'to be' + adjective (entity or place) <i>le vent est froid</i> 'the wind is cold' <i>ta chambre est froide</i> 'your room is cold'	noun + adjective <i>une chambre froide</i> 'a cold room' <i>une atmosphère chaude</i> 'a cold atmosphere'
	2. <i>il</i> (imperson.) + <i>faire</i> 'to make' + adjective (place only) <i>Il fait chaud dans ta chambre</i> 'how cold it is (it makes) in your room' <i>Il fait froid dehors</i> 'it is (makes) cold outside'	
tactile perception	noun + <i>être</i> 'to be' + adjective <i>la soupe est chaude</i> 'the soup is hot'	noun + adjective <i>une soupe chaude</i> 'a hot soup'
personal feeling	sujet + <i>avoir</i> 'to have' + adjective <i>Paul a froid</i> 'Paul is (has) cold'	noun + rel. + <i>avoir</i> 'to have' + adjective <i>Paul qui avait froid</i> 'Paul who was (had) cold'

3.1.2 The specific temperature terms

By comparison with these three generic adjectives, the temperature reference of the eleven other terms in the French temperature system – *torride* 'torrid', *doux* 'sweet', *frisquet* 'chilly', *frais* 'fresh', *bon* 'good', *brûlant* 'burning (hot)', *bouillant* 'boiling', *glacé* 'iced', *glacial* 'icy', (*se*) *geler* 'to freeze (oneself)/*gelé* 'frozen' and (*se*) *cailler* 'to curdle (oneself), to freeze (oneself)' – is slightly more precise. Moreover, their meaning is not only more precise from the temperature viewpoint, but also from the viewpoint of the different kinds of temperature evaluation (i.e. tactile, ambient or personal feeling). The domain of ambient perception is well developed in French since all the terms can at least refer to this kind of evaluation, with the exception of *bouillant*, which only functions in tactile perception.

Only four of these words, *torride*, *frisquet*, *frais* and *glacial*, are primary temperature terms, whereas the reference to temperature in the other terms, like *brûlant*, *doux*, *glacé* or *cailler*, is secondary. Moreover, the reference of these non-primary terms to temperature may be restricted to particular syntactic constructions, especially the adjective *bon* 'good' and the verbs (*se*) *cailler* 'to curdle (oneself)' and (*se*) *geler* 'to freeze (oneself)' (see below). All these terms will be discussed according to the temperature scale, from the hottest to the coldest.

Three terms refer to strong heat (unpleasant or painful heat as well as dangerous heat). First there is the adjective *torride* 'torrid' which is used to describe a very strong heat following an ambient evaluation; for instance a very strong sun (*un soleil torride* 'a torrid sun') as well as an unbearably hot atmosphere (*la chaleur torride de cette fin d'été* 'the torrid heat of this end of summer'). But *torride* cannot be used to refer to the heat of places (?*une pièce torride* 'a torrid room'). There are also two present participles *bouillant* 'boiling' and *brûlant* 'burning (hot)'. *Bouillant* is only used to qualify a liquid (e.g. *une cuve d'eau bouillante* 'a tank full of boiling water') and therefore only occurs in contexts involving tactile evaluation. On the other hand, *brûlant* 'burning (hot)' can be used to refer to tactile evaluation to qualify a solid (Example 8) as well as a liquid (Example 9); but it can also be used in the case of an ambient evaluation (Example 10). But, like *torride* which also functions in the case of an ambient evaluation, *brûlant* 'burning (hot)' cannot be used to refer to the heat of a place. Therefore, it cannot occur in impersonal constructions either (**il fait brûlant*), since these are typical of such evaluations.

- (8) *Ne touche pas le fer à repasser,*
neg touch-2sg.imper neg the iron to smooth.out
il est brûlant!
it be.pres.3sg burning
'Do not touch the iron; it is burning (hot)!'

(9) *L' eau de ton bain est brûlante.*
the water of your bath be.pres.3sg burning
'Your bath water is burning (hot).'

(10) *D'abord, il invente la chaudière*
firstly he inventer-pres.3sg the boiler

tubulaire, procédé consistant à faire passer l'
 tubular process consisting to make go the
air brûlant à travers une série de tubes.
 air burning through a series of tubes

'Firstly, he invented the tubular boiler, using a process which involved driving *burning* (hot) air through a series of tubes.'

To describe a pleasant atmosphere, it is possible to use the adjective *bon* 'good'. Of course, this adjective is not exactly a temperature term; it is a general term referring to anything that is suitable or pleasant. Its thermal reference is only expressed when *bon* is used in the impersonal construction involving the auxiliary *faire* 'to make': *il fait bon ici* 'it's warm in here'.

As for thermal neutrality, there is only one specific to express this concept: the adjective *doux* 'sweet/soft/mild' is only used to refer to a neutral outside atmosphere, or, to be more precise, a moderate temperature with regard to the seasonal average, like 'mild' in English (Example 11). Like *bon*, *doux* can also occur in an impersonal construction involving the auxiliary verb *faire* 'to make' to refer to the temperature of a place (*il fait doux ce matin* 'it's mild this morning').

- (11) *L'air était encore frais et un*
 the air be-imperf.3sg still fresh and a
vent doux venu du sud
 wind gentle come.papa from.the south
soufflait sur eux.
 blow-imperf.3sg on them

'The air was still fresh, and a *gentle* wind from the south blew toward them.'

French has seven terms for expressing specific types of cold: the adjectives *frais* 'fresh', *frisquet* 'chilly', *glacial* 'icy' (Example 12) and *glacé* 'iced' (Example 13) as well as the verbs (*se*) *cailler* 'to curdle (oneself), to be freezing' and (*se*) *geler/gelé* 'to freeze (oneself)'/ 'frozen'. In principle, all are able to refer to an ambient evaluation.

- (12) *Malgré un vent glacial, l'équipe*
 despite a wind icy the team
est parvenue à monter la station.
 be.pres.3sg managed to assemble the structure

'Despite an *icy* wind, the team managed to assemble the structure.'

- (13) *Chaque fois que les vents soufflent*
 each time that the winds blow-pres.3pl
du Nord, ils apportent l'atmosphère
 from.the North they bring-pres.3pl the atmosphere
glacée du pôle.
 iced of.the Pole

'Whenever the winds blow from the North, they bring the *iced* (icy) atmosphere of the North Pole.'

Nevertheless, only two adjectives – *frais* 'fresh' and *frisquet* 'chilly' – and two verbs – *cailler* 'to curdle' and *geler* 'to freeze' – can function in impersonal constructions, which are typical of the evaluation of the temperature of places. Besides, the reference to a climate evaluation of the verbs *cailler* 'to curdle' (Example 14) and *geler* 'to freeze' is restricted to these constructions. As for the adjectives *frais* 'fresh' and *frisquet* 'chilly', they are introduced by the auxiliary verb *faire* 'to make' (Example 15), but they can also occur with the neuter pronoun *ce* and the auxiliary être 'to be': *c'est frisquet* 'it's chilly'.

- (14) *Ça/Il caille ici!*
 that/it curdle-pres.3sg here
 'It is *freezing* (curdling) here!'

- (15) *Il fait* *plutôt frisquet* *ce matin*
 It make-pres.3sg rather chilly this morning
 'It is (makes) rather chilly this morning.'

The verbs *cailler* 'to curdle' and *geler* 'to freeze', as well as the past participle *gelé* 'frozen' (Example 16) can also be used in the case of a personal feeling evaluation (*je caille* or *je gèle/je suis gelé* 'I am freezing'). Moreover, still in the particular case of a personal feeling evaluation, these two verbs can also occur in reflexive constructions in which agent (represented by the subject) and patient (represented by the object) are the same: *se cailler* 'to curdle oneself' (Example 17), *se geler* 'to freeze oneself' (Example 18).

- (16) *Je me* *suis* *gelé* *là-bas.*
 I myself be.pres.1sg frozen there
 'I got frozen (froze myself) down there.'
- (17) *Je me* *caille* *à cause de la* *climatisation.*
 I myself curdle-pres.1sg because of the air.conditioning
 'I am frozen (curdling myself) because of the air conditioning.'
- (18) *Comment faire* *quand on* *se gèle* *au bureau?*
 how do when one oneself freeze-pres.3sg at.the office
 'What shall we do when we are frozen (freeze ourselves) at the office?'

The adjective *frisquet* 'chilly' (Example 15, 19) which is used to refer to a slightly unpleasant cold is the only temperature term which occurs with only one type of evaluation: the ambient evaluation (e.g. *un vent frisquet* 'a chilly wind'). There is also the adjective *frais* that can be used in the cases of ambient (Example 20) and tactile evaluation. Nevertheless, its tactile usage is limited to taste (Example 21). It can designate a disagreeable (Example 20) as well as a pleasant cold (Example 21) or sometimes even a lukewarm temperature. Actually, the appreciation of the degree of temperature depends on the nature of the valued entity and on the temperature scale which is characteristic of this entity.

- (19) *Les matinées sont* *agréablement* *chaudes*
 the mornings be.pres.3pl pleasantly warm
et les soirées sont *légèrement* *frisquettes.*
 and the evenings be.pres.3pl mildly chilly
 'Mornings are pleasantly warm and evenings are mildly chilly.'
- (20) *Le lendemain, une brise fraîche a*
 the next.day a breeze fresh have.pres.3sg
surgit du nord, et le temps est
 spring.up.papa from.the north and the weather be.pres.3sg
maintenant devenu brumeux et intensément froid.
 now become.papa hazy and intensely cold
 'The next day, a fresh breeze sprang up from the north, and the weather has now become hazy and intensely cold.'
- (21) *J'aimerais une boisson fraîche.*
 I like-presco.1sg a drink cool
 'I'd like a cool drink.'

By contrast with *frisquet* 'chilly' and *frais* 'fresh', the verbs (*se*) *cailler* 'to curdle (oneself)' and (*se*) *geler* 'to freeze (oneself)', the adjective *glacial* 'icy' as well as the past participles *gelé* 'frozen' and *glacé* 'iced (icy)' (derived from the verbs *geler* 'to freeze' and *glacer* 'to ice over') may refer to an unbearable or even dangerous cold.

The participle *glacé* 'iced (icy)' and the adjective *glacial* 'icy' share the same thermal reference but they differ in the sense that *glacial* only refers to an ambient evaluation relating to places or the air. The semantic functioning of the past participle *glacé* 'iced' is, on the other hand, more developed. Indeed, this term is not only used in situations involving every kind of ambient evaluation (Example 22), but unlike *cailler* 'curdle', *geler/gelé* 'to freeze'/'frozen' and above all

glacial 'icy', *glacé* can also be used in the case of tactile evaluation even if the use of this past participle is rare because the style is rather literary. Furthermore, in the particular case of a taste evaluation, it is important to notice that *glacé* may refer to a particularly unpleasant cold (Example 23) as well as a refreshing cold (Example 24). Here again, like *frais*, the appreciation of the degree of temperature depends on the nature of the valued entity and on the temperature scale which is characteristic of this entity.

- (22) *Il aspirait avec précaution l' air glacé.*
 he breath-imperf.3sg with caution the air iced
 'He was breathing the iced air in cautiously.'
- (23) *J' ai dormi dans des draps glacés.*
 I have.pres.1sg sleep.papa in some sheets frozen
 'I slept in frozen sheets.'
- (24) *Un café glacé s' il vous plait!*
 a coffee iced if it you like-pres.3sg
 'An iced coffee please!'

Figure 3 shows the distribution of the semantic field of temperatures in French according to the kind of evaluation (ambient perception, tactile perception and personal feeling):

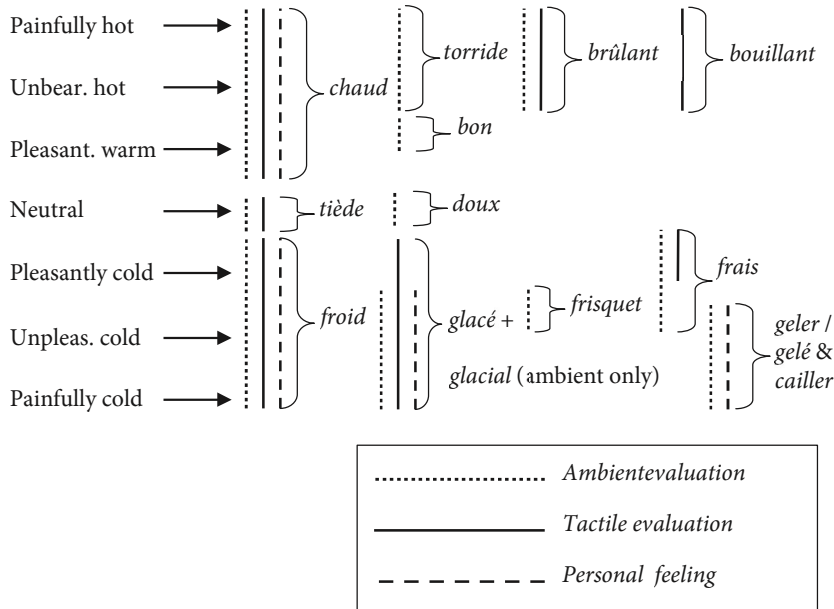


Figure 3. The semantic map of temperature predicative terms in French

3.2 The Wolof lexical field of predicative terms relating to temperature

The system of predicates relating to temperature in Wolof is expressed by means of quality verbs. A quality verb is a state verb qualifying a noun. Such linguistic units, also called adjective verbs, can function as ordinary verbs with TAM specifications (Example 25) as well as a noun modifier in a relative construction (Example 26 & 27):

- (25) *Kafe bii tàng na.*
 coffee this be.warm 3sg.perf
 'This coffee is warm.'
- (26) *kafe bu ñuul*
 coffee rel be.black
 'a coffee which is black' ('a black coffee')
- (27) *kafe bu tàng*
 coffee rel be.warm
 'a coffee which is warm' ('a warm coffee')

The Wolof lexical field of terms relating to temperature (Table 3) is less extensive than the French (see Table 1), being composed of only six quality verbs: two terms for heat (*tàng* ‘to be warm/hot’/‘to feel warm/hot’ and *saas* ‘to be very hot (to be burning hot)’), two for neutral temperatures (*nugg* ‘to be lukewarm’ and *feex* ‘to be mild’) and two for cold (*sedd* ‘to be chilly/cold’ and *liw* ‘to be cold’/‘to feel cold’).

On the other hand, the reference to the type of thermal perception of some French temperature terms may depend on the syntactic construction in which they occur; whereas the syntactic constructions involving Wolof temperature verbs are identical and do not vary depending on the type of evaluation.

Table 3. Wolof predicative terms referring to a temperature

	Ambient	Tactile	Personal feeling
Warm		<i>saas</i>	
	<i>tàng</i>		
Lukewarm	<i>nugg</i>		
	<i>feex</i>		
Cold	<i>sedd</i>		
	(<i>liw</i>)		<i>liw</i>

To refer to warm temperatures, Wolof uses the verb *tàng* ‘to be warm/hot’/‘to feel warm/hot’. Its use is equivalent to the French adjective *chaud* in the sense that it can designate every shade of heat and occurs in each kind of evaluation: ambient perception (Example 28), tactile perception (Example 29) or personal feeling (Example 30).

- (28) *Dafa tàng ba ëpp.*
 3sg.vf be.hot until be.excessive
 ‘It’s excessively hot.’
- (29) *Cere jii, meew mu tàng laa koy booleel.*
 couscous this, milk rel. be.warm 1sg.cf it-imperf put.together
 ‘This couscous, I would serve it with warm milk.’
- (30) *Dama tàng!*
 1sg.vf be.hot
 ‘I feel hot!’

There is also the verb *saas* ‘to be burning hot’ that expresses disagreeable or painful heat, but only in the case of tactile perception.

- (31) *Teg feer bu saas ci sooy! teyeef la!*
 put iron rel be.burning.hot prep silk provocation 3sg.cf
 ‘Putting a hot iron on silk! That’s a provocation!’

There are two verbs that refer to the concept of “lukewarm”. The first one is used in the case of an ambient (Example 32) or tactile perception (Example 33): *nugg*. As for the other term, *feex* ‘to be sweet’/‘mild’, it is only used to describe the ambient temperature of places (Example 34). This latter verb actually refers to an atmosphere experienced as being pleasant since it corresponds to a small drop in temperature after a period of excessive heat (for instance, at the end of a journey).

- (32) *Néeg bii dafa nugg.*
 room this 3sg.vf be.lukewarm
 ‘This room is lukewarm (is a little bit warm).’
- (33) *Danga-y xooj sa-y tank ci ndox mu nugg.*
 2sg.vf-imperf dip your-pl foot prep water rel be.lukewarm
 ‘You will dip your feet in lukewarm water.’
- (34) *Tey féex na.*
 today be.mild 3sg.perf
 ‘It’s mild today.’

Lastly, Wolof has two verbs for referring to cold: *sedd* ‘to be cold/chilly’/‘to feel cold/ chilly’ which refers to the notion of cold in general whatever the kind of evaluation (Example 35 & 36), like *froid* in French; and *liw* ‘to feel cold’ which occurs when the evaluation relates to a personal feeling (Example 37). *Liw* can also be used to refer to the weather: ‘to be cold’. But this meaning, which is rarely attested, is only observed in impersonal predications (Example 38).

- (35) *dafa sedd, sàng ko.*
 3sg.vf be.cold, cover him
 ‘It’s chilly; cover him!’
- (36) *Sa kafe gi di-na sedd.*
 your coffee the imperf.-3sg.perf be.cold
 ‘Your coffee will be cold.’
- (37) *Kenn d-u ni liw nga ak*
 anybody imperf-neg s ay feel.chilly 2sg.perf with
yëre yi nga tegle!
 clothe rel.pl 2sg.aor stack
 ‘Nobody says you feel chilly with the clothes you heap on!’
- (38) *Tey dafa liw!*
 today 3sg.vf be.cold
 ‘How cold it is today!’

Wolof makes also use of ideophones to indicate intensification, in the manner of adverbs like *très* ‘very’ in French. An ideophone is a sound representation evoking an impression relating to sensations or sensory perceptions. The main feature of Wolof ideophones is that each one is related to a small number of verbs (or even only one verb). Thus, the ideophone *guy* only functions with the verb referring to the concept of cold (with *sedd*, Example 39); and the ideophone *jér* only functions with the verb referring to the concept of heat (with *tàng*, Example 40).

- (39) *Sa cat-u akkan ba-a ngi sedd guy.*
 your tip-of nose the-fp presen be.sedd ideo
 ‘The tip of your nose is very cold.’
- (40) *Dafa tàng jér, jél-al l-oo ko jàpp-e.*
 3sg.vf be.hot ideo take-2sg.imper rel-2sg.aor it catch-appl
 ‘It is extremely hot; use something to take it.’

Figure 4 represents the map for the semantic field of Wolof predicative terms relating to temperature:

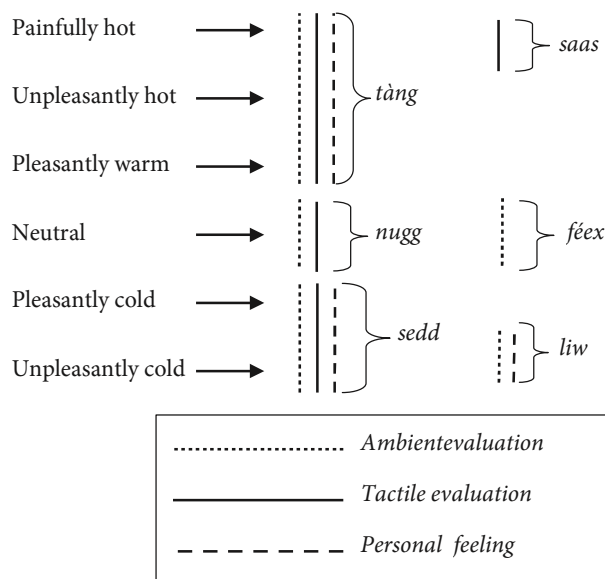


Figure 4. The semantic map of temperature predicative terms in Wolof

3.3 Comparison of the systems

At first, from a semasiological viewpoint, concerning the counting of predicative terms on the temperature scale (warm/lukewarm/cold) according to the different types of evaluations (tactile perception, ambient perception and personal feeling), the French system shows a more developed lexical organisation than Wolof: French is indeed composed of thirteen terms including three generic terms (i.e. *chaud* 'warm/hot', *tiède* 'lukewarm' and *froid* 'cold') and eleven terms specific to a more precise temperature degree and/or to a particular kind of evaluation (e.g. the adjective *torride* 'torrid' for strong heat relating to ambient perception; the verb *cailler* 'to curdle' for disagreeable cold relating to ambient perception and personal feeling). On the other hand in Wolof, the temperature system also counts three generic terms (*tàng* 'to be/feel warm'/'to feel hot/warm', *nugg* 'to be lukewarm' and *sedd* 'to be chilly/cold'/'to feel chilly/warm') but only three specific terms (*saas* 'to be burning hot', *féex* 'to be mild (for the thermal atmosphere of a place)' and *liw* 'to feel cold' or 'to be cold (for the thermal atmosphere of a place)').

Secondly, from an onomasiological viewpoint and as regards the global understanding of the temperature scale, French and Wolof temperature systems are both ternary since they are composed of three levels of temperatures (*chaud* and *tàng* for warm temperatures, *tiède* and *nugg* for neutral temperatures and *froid* and *sedd* for cold temperatures). As for the expressible scale of temperature degrees, it is clear that the French system can refer to a wider range since for example, it distinguishes between several kinds of cold (e.g. *frais* 'fresh/cool' for a pleasant or unpleasant cold, *frisquet* 'chilly' for an unpleasant cold and '*cailler* 'to curdle' for an unbearable cold...); Wolof on the other hand does not contain so many words. But all these considerations do not mean that Wolof speakers are unable to differentiate between slight differences of temperature since it is always possible to resort to ideophones involving temperature references (e.g. *guy* 'very (cold)'; see Example 39 & 40).

Lastly, about the different frames of temperature perception (ambient evaluation, tactile evaluation or personal feeling), both French and Wolof have terms which can be used for only one kind of perception or which are limited to two kinds of frame. Indeed, to describe a hot temperature, French can use *torride* 'torrid' for ambient perception and *bouillant* 'boiling' for tactile perception. The Wolof verb *saas* 'to be burning hot' is only used in the case of tactile perception and *feex* 'to be mild' in the case of ambient evaluation. However, in French, the reference to a kind of perception may also involve particular syntactic constructions, whereas Wolof does not exhibit such grammatical restrictions. There are, for example, the verbs *cailler* 'to curdle' and *geler* 'to freeze' which can function in reflexive constructions when they refer to a personal feeling evaluation (i.e. *se cailler* 'to curdle oneself' and *se geler* 'to freeze oneself'). And there is also the impersonal construction involving the verb *faire* 'to make', which can be used when evaluating the temperature of a place. In fact, the reference to temperature in the term *bon* 'good' is only valid when this adjective occurs in this kind of construction.

To conclude this comparison of the two lexical systems, even though French is lexically more developed than Wolof in terms of number of terms expressing temperature, both are composed of three generic terms defining the basis of the temperature scale and both contain terms or particular syntactic constructions involving a more precise reference with regard to the degree of temperature and the kind of frames of evaluation.

Because of the fact that the temperature never drops below 18°C in Senegal, Wolof people do not know what dangerous cold is and only experience temperatures relating to a pleasant or unpleasant cold. The proof is that their clothes are made solely of lightweight fabrics, and if they were really bothered by the cold, their clothes would be thicker. This suggests a motivation for the fact that there are no Wolof words equivalent to the French terms like *gelé* 'freeze', *glacé* 'iced' / *glacial* 'icy', (*se*) *cailler* 'to curdle (oneself)', (*se*) *geler* 'to freeze (oneself)' or even *frisquet* 'chilly'. So one might assume that the reason the French system is more developed is that French speakers experience a wider range of temperatures than the Senegalese.

4. Temperatures and polysemantic patterns

This section presents the polysemous patterns generated from the terms presented above. Except for *frisquet* 'chilly' in French and *nugg* 'to be lukewarm' in Wolof, all these terms are polysemous.

First, I will present for each language the polysemous patterns related to heat, lukewarm and cold.

4.1. Theoretical frameworks

I define a *polysemous pattern* (or *polysemantic pattern*) as being the relationship between the different values (or notions) expressed by a single linguistic unit. These semantic patterns can be considered in two different ways: following either a synchronic view or a diachronic view. In the first case, the aim is to analyse the different semantic values expressed by an item at a precise moment in time. For instance, currently, the French adjective *torride* ‘torrid’ is used to refer to a very strong heat, but it can also be used to describe situations involving intense sexual arousal. Linguistic units characterised by several meanings are called polysemous terms. In the second case, the aim of a diachronic analysis is to study the semantic evolution (or *semantic shift*) of the values expressed by an item through the time; for example, the fact that the adjective *torride* ‘torrid’ comes from the Latin *torridus* which means ‘dried out’.

It is difficult to study the semantic shift of a particular lexical domain in an oral language such as Wolof because there is no documentation of its earlier forms. Indeed, Written Wolof dates only from the end of the 20th century. Therefore, this paper only analyses the semantic associations of words referring to temperature from a synchronic perspective.

Following Jacquet et al. (2005), two kinds of polysemous terms can be distinguished: firstly, there is polysemy with *synonymy*, when one of the different meanings of a polysemous word is also expressed by another (Figure 5). Secondly, there is *strict* polysemy when there is no other word (i.e. no synonym) to express the different meanings of a polysemous word (see Figure 6). Following Haspelmath (2003: 239), whenever two notions are expressed by a single linguistic unit in a given language while these same notions are expressed by two different linguistic units in another, this is evidence of a polysemous phenomenon.

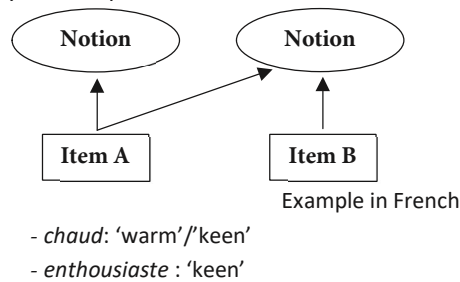


Figure 5. Polysemous synonymy

The process relating to the development of a new meaning which underlies each polysemantic pattern results from a cognitive operation. Following Blank (2000: 59–74), ten mental operations can generate polysemous patterns. In the analysis that follows, I will use four of these: metaphor, metonymy, generalisation and specialisation. These various operations may also need linguistic support in order to embody these polysemous patterns (Koch 2000). For instance, there are cases for which the semantic patterns are obtained by assembling (i.e. compounding or idiom). For example, in Wolof, the idiom *tàng-xol* (literally, ‘to be.hot-heart’) means ‘to be frustrated’. There are also cases for which the semantic pattern is embodied through a particular syntactic construction. This is the case with the French adjective *bon* ‘good’ that only involves a temperature reference when it occurs in an impersonal construction involving the auxiliary verb *faire* ‘to make’: *il fait bon* ‘it’s warm’. Lastly, in some cases, there is no need for a linguistic transformation to build the semantic pattern; the two connected notions are expressed by a single linguistic unit without morphological and/or syntactic modifications, like the French adjective *torride* ‘torrid’ which also means ‘sensual’ (e.g. *une chaleur torride* ‘a torrid heat’, *un baiser torride* ‘a torrid [sensual] kiss’).

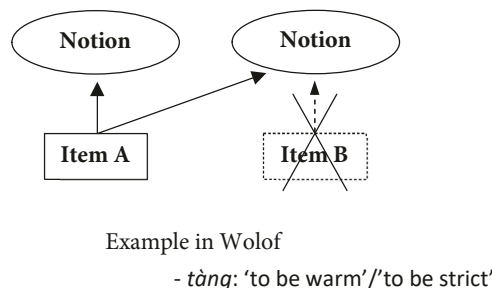


Figure 6. Strict polysemy

4.2 Polysemous patterns involving the notion of heat

4.2.1 In French

The polysemous usages of the adjective *chaud* 'warm/hot' can be divided into four parts. First, *chaud* commonly suggests the idea of agitation or excitement, in other words a heightening of feelings and emotions. With this type of usage, *chaud* may characterise the excitement of individuals. In this case, the nature of the heightening relates to a psychological state (e.g. 'passionate', 'keen'.../Example 41) as well as to a state of mind (e.g. 'excited', 'nervous', 'restless'...). Also *chaud* often assumes an erotic nature (Example 42). But *chaud* may also characterise the excitement of groups to describe a heightening relating to political and/or social tension that may turn violent (Example 43). Moreover, the connotations of most of these uses are usually positive (e.g. 'excited', 'passionate', 'enthusiastic') but they can also be negative (e.g. 'angry', 'violent'). In this sense, the verbal expression *avoir le sang chaud* can mean 'to have a short fuse' ('irritable'), 'to be hot-headed' ('impetuous') as well as 'to be hot-blooded' ('sensual').

(41) *Daniel est un chaud partisan de la voiture électrique.*
 Daniel be.pres.3sg a warm fan of the car electric
 'Daniel is a warm (dedicated) fan of the electric car.'

(42) *Voilà une vidéo très chaude où une charmante demoiselle brune va se donner en spectacle devant sa caméra.*
 this a video very hot where a charming young.lady brown go.pres.3sg herself give in show in.front.of her camera
 'This is a very hot (erotic) video in which a charming brunette is going to do a show in front of the camera.'

(43) *A cause des élections, le mois de février sera chaud.*
 because.of.the elections the month of February be.fut.3sg hot
 'Because of elections, the month of February will be hot (politically instable).'

In the second type of polysemous usages, the term *chaud* is used to refer to the notion of danger in colloquial French. This kind of polysemous pattern can be observed in spontaneous use as well as in idioms such as the expression *chaud devant!* (lit. 'warm in front') which means 'out of the way'⁴.

(44) *Cassons-nous Paulo, ça devient chaud!*
 break-1pl.imper ourselves Paulo it become-pres.3sg hot
 'Let's push off Paulo, it's getting hot (dangerous)!'

In the third type of usage, *chaud* refers to breaking news.

(45) *Une nouvelle chaude est une nouvelle reliée à l'actualité immédiate.*
 a news hot be.pres.3sg a news connect.papa to the topicality current
 'Hot (up-to-the-minute) news is news that is connected to current events.'

These three types of polysemous patterns displayed by *chaud* can be combined. For instance, *un quartier chaud* (lit. 'a hot district') can designate a neighborhood associated with the sex business ('a red-light district') and/or a dangerous place. *Un dossier chaud* (lit. 'a hot file') refers to a topical file and one that has to do with a critical and sensitive issue.

Finally, in a last type of polysemous usage, the adjective *chaud* designates bright colors, as does 'warm' in English:

(46) *Les couleurs chaudes semblent s'*
 the colors warm seem-pres.3pl oneself

⁴ Note that this expression is only used in the specific context of serving food (originally used by waiters and then extended to domestic usage).

avancer dans le paysage et semblent
 move in the landscape and seem-pres.3pl
plus proches qu'elles ne le sont vraiment.
 more closer than they neg it be.pres.3pl really
 'Warm colors appear to stand out in the landscape, and seem closer than they really are.'

For the most part, the polysemous usages of the other terms relating to warm temperatures are similar to those developed by *chaud*; but their conceptual domain of application is more limited in comparison. For instance, the adjective *torride* 'torrid' which normally refers to very strong heat in ambient perception, can also designate excitement – like *chaud* – but only in relation to example 47. In other words, it communicates erotic ecstasy:

(47) *Patrizia D'Addario, rendue célèbre après avoir*
 Patrizia D'Addario become.papa famous after have
révélé avoir passé une nuit torride
 reveal.papa have spend.papa a torrid night
avec Silvio Berlusconi, raconte ses
 with Silvio Berlusconi tell-pres.3sg her
ébats avec le chef du gouvernement.
 lovemaking with the head of.the government
 'Patrizia D'Addario, famous for revealing that she had spent a *torrid* (sexually exciting) night with Silvio Berlusconi, tells of her lovemaking with the head of government.'

In the same way, the present participle functioning as an adjective *brûlant* 'burning' often used to designate a disagreeable or painful heat, can also be used to qualify a fact which stands out either because of its passionate character (Example 48) and/or its topicality (*un sujet brûlant* 'a burning (topical) issue'): two polysemous values already developed by the adjective *chaud*.

(48) *A peine arrivées dans la chambre, nous*
 barely arrived in the room we
nous sommes étreints pour échanger
 ourselves be.pres.1pl embrace.papa to exchange
un baiser brûlant.
 a kiss burning
 'Just after entering the room, we embraced and exchanged a *burning* (passionate) kiss.'

The other present participle referring to a painful heat – *bouillant* 'boiling' – can also qualify a notion relating to a heightening of feeling, but this usage is limited to the temperament of an individual:

(49) *Le bouillant et fantasque colonel Mouammar*
 the boiling and whimsical Colonel Muammar
Kadhafi, autoproclamé "roi des rois
 Gaddafi proclaim.himself.papa "king of.the kings
traditionnels d'Afrique", était alors le
 traditional of Africa be-imperf.3sg then the
doyen des dirigeants arabes et africains.
 doyen of.the leaders Arab and African
 'The *boiling* (hot-headed) and whimsical Colonel Muammar Gaddafi, who proclaimed himself "king of African traditional kings", was the leader of Arab and African leaders at this time.'

4.2.2 In Wolof

We have already seen that in Wolof only two words may refer to heat: *tàng* 'to be/ feel hot/lukewarm' and *saas* 'to be very hot (burning)' which only functions in tactile perception. Most of the polysemous patterns developed by the verb *tàng* 'to be hot' can also be observed in French. Firstly, like *chaud* 'warm/hot, *tàng* can refer to a strong agitation

or an excitement. Nevertheless, in comparison with *chaud*, these semantic patterns systematically have a negative connotation like ‘to be nervous’ or ‘to be irritable/grumpy’ (Example 50). So, in wolof, *dafa tàng* (literally ‘he feels hot’) can also mean ‘he’s nervous’. And when these polysemous usages concern the behaviour of a group rather than an individual, *tàng* means ‘to be fierce’ in conflict (e.g. a fight or an election), as illustrated in Example 51:

- (50) *Goor gii, dafa tàng, moo tax nit*
 man that 3sg.vf be.warm 3sg.sf cause people
ñi bàyyi ko ak màrsandiis-am.
 the leave him with merchandise-his
 ‘That man is really hot (grumpy), that’s why people left him with his merchandise.’
- (51) *Bère bi Mustafa Gë ak Tyson tàng-oon na.*
 struggle the Mustapha Guë and Tyson be.warm-past 3sg.perf
 ‘The struggle between Mustapha Guë and Tyson was hot (fierce).’

In addition to these notions of nervousness/irritability, one can further observe the more general idea of having to bear someone’s difficult behaviour, or even difficult constraints relating to strict rules (Example 52).

- (52) *Reegalmaa bi dafa tàng.*
 rule the 3sg.vf be.warm
 The rules are hot (strict).

In the same way, there are metaphorical verbal expressions based on the heat of an entity. For instance, there is the expression *tàng-diine* (literally ‘to be.hot-religion’) which means ‘to be strict and (therefore) tiresome (for a person)’. There is also the expression based on the heat of the stomach, *tàng-mbàq* (lit. ‘to be.hot-stomach’) ‘to fall out’, ‘to quarrel’:

- (53) *Omar dafa tàng diine.*
 Omar 3sg.vf be.warm religion
 ‘Omar is hot-religion.’ (‘It is difficult to live with Omar.’)

Lastly, there is also a second semantic value which can be expressed by *tàng* when it functions in a verbal expression referring to the heat of an organ also: *tàng-xol* (literally ‘to be.hot-heart’), which refers to a person’s frustration. The noun *xol* ‘heart’ used with the verb *tàng* can also form an adverbial expression that means ‘unwillingly’, *cixol-bu-tàng* (literally ‘in a heart which is warm’).

As for the verb *saas*, its polysemous value can only describe a spicy taste. But this reference is also shared by the verb *tàng*, as we can notice in the following example:

- (54) *Ag kaani, lu mu tàng tàng,*
 a chili rel 3sg.aor. be.warm be.warm
doom ba gën koo saas!
 seed the be.more it-conn be.burning
 ‘A chili pepper, however hot [hot] (spicy) it is, its seed is even more burning (spicy)!’

4.3 Polysemantic patterns and neutral temperature terms

4.3.1 In French

The adjective *doux* ‘sweet’, used to refer to a mild atmosphere, is not primarily a temperature term. In fact, this adjective is normally used to designate a pleasant experience relating to sensory perception in general (*une douce caresse* ‘a sweet caress’), or taste perception (*doux comme le miel* ‘as sweet as honey’). It may also distinguish a fact or an entity as moderate (*une pente douce* ‘gentle slope’). And this kind of usage also concerns air temperature:

- (55) *Un hiver doux donne un été*
 a winter mild give-pres.3sg a summer
pluvieux, tandis qu’ un véritable hiver
 rainy whereas a real winter

amène un été sec.
bring-pres.3sg a summer dry
'A mild winter will be followed by a rainy summer; whereas a real winter brings a dry summer.'

Lastly, this adjective may describe a calm person who is pleasant to live with:

(56) *Un caractère doux supporte un*
a temperament sweet bear-pres.3sg a
caractère impétueux, s' il n' est
temperament impetuous if it neg be.pres.3sg
pas dépourvu de bonté.
neg devoid of kindness
'A sweet (calm) temperament can bear an impetuous one if its owner is not devoid of kindness.'

As for the adjective *tiède* 'lukewarm', its polysemous usages are limited and only indicate a lack of excitement:

(57) *Elle est restée tiède à mes avances.*
she be.pres.3sg keep.papa lukewarm to my advances
'My advances left her lukewarm (half-hearted).'

4.3.2 In Wolof

In Wolof, two terms may refer to lukewarm temperature – *nugg* 'to be lukewarm' and *féex* 'to be cool', but only the latter is polysemous. Whereas the verb *feex* originally refers to cool air temperature, its polysemy is connected to the notion of freedom, or to be more precise, an absence of constraint. But it seems that this polysemous development only concerns individuals or places and nothing else. This concept can be divided into four groups. Firstly, the meaning of *féex* is related to the notion of inactivity for either a person (Example 58) or a room (Example 59). So it can be translated by 'to be free' or 'to be vacant':

(58) *Tey, féex naa, mën nañu dem tefes.*
today be.cool 1sg.perf can 3pl.perf go beach
'Today, I am cool (am free); we can go to the beach.'

(59) *Dem-leen ca néeg bale, féex na.*
go-2pl.imper prep room that.over be.cool 3sg.perf
'Go to that room over there; it is cool (it's vacant).'

Next, this concept of absence of constraints can also convey a notion of wellbeing (Example 60) as well as a notion of quietness relating to a place (*bërëb bu féex* 'a peaceful place, literally 'a place which is cool'):

(60) *Léegi bi ma simm-ee s ama-y dàll, féex naa.*
now when 1sg.aor take.off-ante my-pl shoe be.cool 1sg.perf
'Now when I take off my shoes, I am cool (I feel comfortable).'

Moreover, based on generalisation of this last meaning, *féex* can refer to an easy person, someone who easily bears life's constraints as well as a person who is pleasant to live with since he does not impose constraints on others (Example 61). Nevertheless, *féex* can also describe a person who is casual or inconsiderate towards other people (Example 62):

(61) *Sa xarit bi moom dafa rekk féex*
your friend the him 3sg.vf only be.cool
'Your friend is really cool (easy/casual).'

(62) *Ku féex la, fu mu jot tēdd.*
who be.cool 3sg.cf where 3sg.aor arrive lie.down
'This one is really cool (casual), wherever he goes, he lies down.'

Lastly, based on an expression referring to a 'fresh head', the verb *féex* can express the fact that somebody is relieved after a headache:

- (63) *Tey kay sama bopp bi féex na;*
 today really my head the be.cool 3sg.perf
démb dafa d-oon metti bu baax.
 yesterday 3sg.vf imperf-past be.hard rel be.well
 ‘Today my head *is cool*; yesterday it was very hard (Today my headache is better; yesterday it hurt a lot).’

4.4 Polysemantic patterns and cold temperature terms

4.4.1 In French

Across the range of its polysemous usages the French adjective *froid* ‘cold’ describes an absence of agitation (as well as motion) or a lack of excitement (*un style froid* ‘a bloodless style’). From this viewpoint, this term once again functions as the antonym of the adjective *chaud* ‘hot’. Nevertheless, *froid* differs from *chaud* in that its polysemy usually characterises the behaviour of individuals (Example 64). But this is not a systematic rule: the idiom *guerre froide* ‘cold war’ proves this, although it is a loan translation from English.

- (64) *Il est resté froid devant ce spectacle.*
 he be.pres.3sg stay.papa cold in.front.of this sight
 ‘He stayed *cold* (was unmoved) by this sight.’

This absence of agitation has two connotations, positive and negative. In the first case, *être froid* can be translated by ‘to be calm’ or ‘to be in control of oneself’. This latter meaning can also be observed in the idiom *garder son sang froid* ‘stay calm’ (lit. ‘to keep one’s cold blood’) which is the antonym of the idiom *avoir le sang chaud* ‘to be hot-headed’ (lit. ‘to have hot-blood’). But *froid* can also have negative connotations that are translated by the adjectives ‘indifferent’ or ‘aloof’ in English (Example 65). There is also the idiom *être en froid avec quelqu’un*, literally ‘to be cold towards somebody’, which refers to conflict between people (Example 66). Lastly, there is the adverbial expression *de sang-froid* ‘cold-bloodedly’ (lit. ‘in cold blood’), which is usually used to refer to the fact that a murder had been committed in a deliberate and resolute way.

- (65) *Il a été très froid avec nous ; il ne nous a quasiment rien dit.*
 he have.pres.3sg be.papa very cold towards us he neg us have.pres.3sg virtually anything say.papa
 ‘He was very *cold* (reserved) towards us; he said virtually nothing.’
- (66) *Je suis en froid avec ma belle-mère.*
 I be.pres.1sg in cold towards my mother-in-law
 ‘I am *cold* towards my mother-in-law.’ (‘I am on bad terms with my mother-in-law.’)

Among the six other French terms referring to the cold, *cailler*, *geler/gelé* and *glacé* share the specificity that their meaning does not primarily refer to the notion of temperature. Nevertheless, *geler (gelé)* and *glacé* are indirectly related to the domain of cold since the verb *geler* originally means ‘to turn something from a liquid to a solid state by lowering the temperature’ (Example 67). And *glacé* ‘iced’ is the past participle of the verb *glacer* ‘to solidify by lowering the temperature, to convert into ice’ (Example 68), which is derived from the noun *glace* ‘ice’. The adjective *glacial*, which is also derived from *glace* ‘ice’, differs from the participle *glacé* in that it is intrinsically a temperature term.

- (67) *Le froid a gelé les premières fleurs.*
 the cold have.pres.3sg freeze.papa the first flowers
 ‘The cold has *frozen* the first flowers.’
- (68) *Le froid était assez intense pour glacer le vin.*
 the cold be-imperf.3sg enough intense to freeze the wine
 ‘The cold was intense enough to *freeze* the wine.’

As for the verb *cailler*, it originally means ‘to coagulate/to form curds’ (of milk). There is a semantic similarity with the verbs *geler* and *glacer*, because all three involve a transformation into a solid state.

- (69) *La pressure est utilisée pour faire*
 the rennet be.pres.3sg use.papa for make
du fromage en caillant du lait.
 some cheese by curdling some milk
 'Rennet is used for making cheese by *curdling* milk.'

The verb *cailler* has not developed other polysemous extensions; and those which concern *geler/gelé* and *glacé/glacial* are limited. Still, the past participle *glacé* and the adjective *glacial* can also indicate lack of interest relating to the social behaviour of an individual or a group or even hostile indifference (Example 70). This meaning has also been developed by the adjective *froid* 'cold'. Lastly, *glacé* is also used to refer to the feeling of fear as in the idiom *être glacé d'épouvante*, literally 'to be icy with fear' which means 'to be terror-struck' as well as the idiom *faire froid dans le dos* in the Example 71:

- (70) *A notre arrivée, nous avons reçu*
 at our arrival we have.pres.1pl receive.papa
un accueil glacé.
 a welcome iced
 'On our arrival, we received an *iced* (icy) welcome.'
- (71) *Ton histoire lui a fait froid dans le dos.*
 your story him have.pres.3sg make.papa cold in the back
 'Your story sent *chills down* her spine.'

As for the verb *geler*, it can also indicate that an activity (usually connected to finance) has been interrupted (Example 72). Both these meanings convey an idea of stillness, a notion which is iconically driven since the cold slows down our movements.

- (72) *Les crédits accordés par la Banque Mondiale*
 the credit granted by the World Bank
à la Côte d'Ivoire ont déjà été gelés.
 to the Cote d'Ivoire have.pres.3pl already be.papa frozen
 'The credit granted to Cote d'Ivoire by the World Bank has already been *frozen* (stopped).'

The meanings developed by all these terms of cold temperature (i.e. absence of agitation, lack of interest, feeling of fear, interrupted activity) convey an idea of stillness, a notion which is iconically driven since the cold slows down our movements.

Finally we discuss the adjective *frais* 'chilly (and humid)' for which the temperature meaning is secondary. Indeed, this term is at first used to refer to recently gathered plants (*des fleurs fraîches* 'fresh flowers') or recently made food (*beurre frais* 'fresh butter') as well as something new which is not dry yet (*peinture fraîche* 'wet paint' & Example 73).

- (73) *La blessure est encore fraîche.*
 the wound be.pres.3sg still chilly
 'The wound is still *chilly* (recent).'

Based on the notion of novelty, *frais* is also used to qualify recent things or facts, and more generally news (Example 74), as well as something or somebody who has preserved or regained her strength or vitality (Example 75). Such a meaning can also be observed in the idiom *être frais comme un gardon* 'to be on top form' (lit. 'to be as fresh as a roach').

- (74) *J'ai reçu des nouvelles fraîches.*
 I have.pres.1sg receive.papa some fresh news
 'I have some *fresh* (recent) news.'
- (75) *Je ne me sens pas trop frais ce matin.*
 I neg myself feel.pres.1sg neg too fresh this morning
 'I don't feel too *fresh* (well) this morning.'

4.4.2 In Wolof

The Wolof verb *sedd* 'to be/feel cold/chilly' is also characterised by a polysemous functioning, but not as productive as its antonym, the verb *tàng* 'to be/feel warm/hot'. Most of its semantic patterns characterise the mental and psychological state of a human being. Thus, without morphosyntactic modification, *sedd* can mean 'to be calm' (Example 76) as well as 'to be dead' (Example 77).

(76) *Sa doom jii, aka sedd.*
Your child this how be.cold
'How cold (calm) is your child.'

(77) *Boo rend-ee ganaar gi, nanga*
When cut.throat-ante chicken the 2sg.oblig
nég mu sedd, nga sog koo suqi.
wait 3sg.aor. be.cold 2sg.aor do.then it-conn pluck

'When the throat of the chicken is cut, you wait until it *is cold* (it gives no sign of life), then you pluck it.'

Then, like *tàng*, the verb *sedd* also occurs in various metaphorical constructions based on a cold 'heart', *xol* in Wolof⁵. Such constructions may refer to the fact that a person (the owner of the heart) is 'satisfied' (Example 78 & 79) as well as to express an action that has been accomplished gladly, as in the adverbial expression *ci xol bu sedd*, literally 'in a heart which is cold'.

(78) *sama xol sedd na ci liggéey bi mu def.*
my heart be.cold 3sg.perf prep work which 3sg.aor do
'My heart *is cold* (I am satisfied) with the work he did.'

(79) *Fu ngërëm am, xol a fa sedd.*
where thanks exist heart pf there be.cold
'Where there is gratitude, the heart *is cold* (somebody is satisfied).'

4.5 Comparison

Across the range of semantic patterns developed by temperature predicates in French and Wolof, it is interesting to note that many polysemous patterns involving the concepts of heat and cold are identical between the two languages or semantically very close. Indeed, the terms related to the expression of heat have a clear tendency to refer to nervousness, excitement and more generally an excess of agitation (e.g. *chaud* in French and *tàng* in Wolof 'hot'/'impetuous'). As for the terms relating to the expression of cold, they tend to refer to a lack of (re-)action (e.g. *froid* in French, *sedd* in Wolof 'cold'/'indifferent'). From this perspective, I notice that the polysemous notions connected to each of these two concepts retain the antonymic relation which defines temperature terms (e.g. in Wolof, *tàng* 'to be hot'/'unwilling' vs. *sedd* 'to be cold'/'gladly' or in French *chaud* 'hot'/'keen' vs. *froid* 'cold'/'indifferent').

There are of course some patterns which have developed in one of the two languages and which have no counterpart in the other. For example, based on the notion of excitation, the French adjective *chaud* can also refer to the sensuality or agitation that can also have an immediate and/or dangerous connotation. In Wolof, through the concepts of nervousness and irritability, the verb *tàng* associates with the notions of argument and (psychological or moral) stiffness, as well as frustration and lack of enthusiasm.

It is also interesting to note that some of the associations that have developed around the concepts of heat and cold in each of these languages can sometimes diverge. This is the case with the pattern 'hot'/'enthusiastic' in French, which is the antonymic opposite of the combination 'cold'/'unwilling'. In Wolof, on the other hand, the notion of 'cold' is associated with 'glad', and 'hot' with 'unwilling'.

In fact, what differentiates these languages is that the French polysemous patterns involving the concept of heat have connotations which can be positive (e.g. 'sensual', 'passionate', 'enthusiastic') or negative (e.g. 'irritable', 'impetuous'), whereas in Wolof, they all have negative connotations (e.g. 'nervous', 'irritable', 'strict', 'frustrated'). With the concept of cold, the opposite is true: the polysemous patterns involving the concept of cold in Wolof have both

⁵ Compare the idiom *tàng-xol* 'to be frustrated', literally 'to be.hot-heart' and the adverbial locution *ci-xol-bu-tàng* 'unwillingly', literally 'in a heart which is warm'.

connotations positive (e.g. 'gladly', 'satisfied') and negatively (e.g. 'dead'). Moreover, Wolof also shares the pattern between 'cold' and 'calm'. As for French, its polysemous patterns all have negative connotations (e.g. 'indifferent', 'on bad terms'). Of course, the French combination 'cold'/'calm' could be seen as an exception, but from a pragmatic viewpoint, this reference to calmness by means of the adjective *froid* 'cold/chilly' is always used in contexts for which it is necessary to maintain one's self-control despite the circumstances (*garder son sang froid* 'stay calm', literally 'to keep his cold blood'); or when a murder has been committed impassively (*de sangfroid* 'cold-bloodedly', literally 'in cold blood'): two situations negatively connoted.

Based on the generic terms *chaud* 'warm' and *froid* 'cold' in French and *tàng* 'to be warm/hot, to feel warm/hot' and *sedd* 'to be chilly/cold, to feel chilly/cold' in Wolof, Figure 7 sums up this analysis by displaying the polysemous patterns shared by the two languages as well as the patterns of divergence.

It is possible to correlate the polysemous behaviour of temperature terms with the cultural representations relating to the perception of climate. I previously showed that French speakers share representations which are more negative for cold than for heat, since the average temperatures they experience are clearly below the degree of thermal comfort. Senegalese people, on the other hand, share a positive attitude towards cold, in comparison to warmth, since the temperatures they experience are generally higher than the degree of thermal comfort. Therefore I conclude that the environment can have a certain influence on the development of semantic associations by directing them towards notions that are in keeping with an appropriate cultural symbolism.

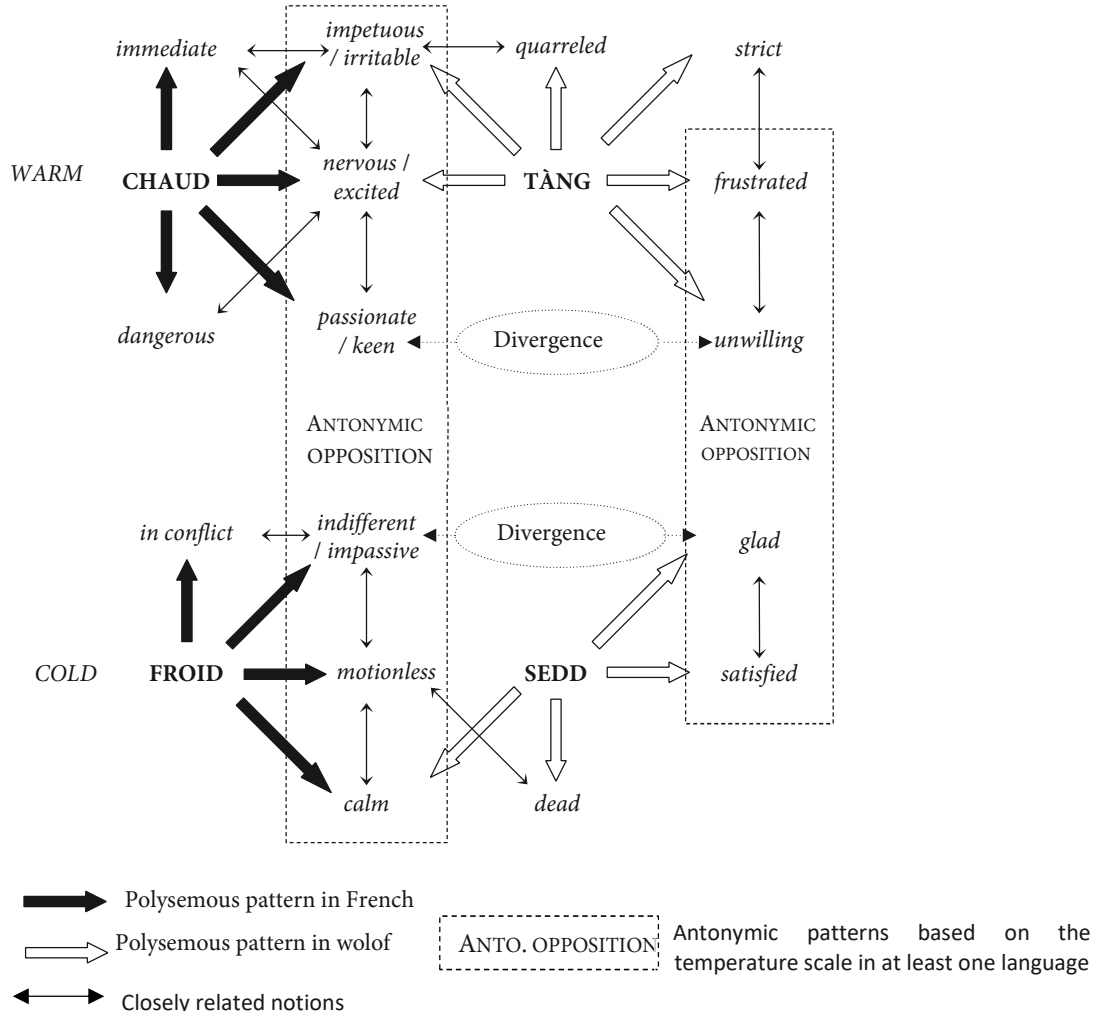


Figure 7. Semantic map of the main polysemous patterns observed in French and Wolof

The symbolism of heat is very important in Wolof culture. For instance, at the end of the 19th century, Cheik Ahmadou Bamba, a Senegalese Muslim saint, founded Touba, a town located in the hottest part of the whole Wolof region. This place was chosen because according to Bamba, the only way to improve oneself is to live a hard life. He

had these words to say: “Expect from me neither shelter to protect from the sun nor any other material possession”. Moreover, some Wolof people think that Holy Fridays are hotter than the other days because these days are opportunities given by Bamba to improve oneself.

The polysemous patterns displayed by the terms referring to neutral temperatures (i.e. the Wolof verb *féex* ‘to be mild’ and the French adjective *tiède* ‘lukewarm’) are also interestingly different. The polysemous usages of the term *tiède* are defined according to the antonymic scale ‘hot’/‘excitation’ – ‘cold’/‘impassive’ in the sense that *tiède* can also refer to a moderate attitude (neither excited nor inactive). In contrast, the polysemous associations developed by *féex* have no relation with this antonymic opposition since the associated notions are rather related to the concept of absence of constraints (e.g. ‘free’, ‘vacant’, ‘easy (for a person)’, ‘inconsiderate’). But note also that the French adjective *doux* ‘sweet’/‘mild’, which is not originally a temperature term shares a semantic pattern – ‘sweet’/‘gentle’ – that is very close to *féex*.

In fact, these two terms (*doux* and *féex*) are related to neutral temperatures but they do not share the same contextual reference since *doux* may refer to an ambient temperature which is moderate in comparison with the seasonal average (neither too hot nor too cold), whereas *féex* refers to the drop of temperature which follows a period of heat – a phenomenon that is experienced as a real relief. Here again, I conclude that the physico-cultural experience of climate may affect the polysemous functioning of temperature words.

□. Conclusion

First of all, concerning the lexical organisations, there is a similar type of system in both languages built on a three-way contrast between hot, cold and neutral temperatures. For each of the two languages, I distinguished between two kinds of temperature terms: (i) those with a generic reference (i.e. the terms referring to a general evaluation of the temperature and in accordance with the three basic levels of thermal reference, like *chaud* ‘hot/warm’ in French or *sedd* ‘to be/feel chilly/cold’ in Wolof) and (ii) those with a specific reference (i.e. the terms involving a reference to more precise degrees of temperature, like *glacé* ‘frozen’ in French or *liw* ‘to feel cold/chilly’ in Wolof). The generic terms can be used whatever the frame of perception (tactile, ambient or personal feeling), whereas the specific terms involve a reference to a more precise method of evaluation.

The French system can be seen as being quantitatively richer (fifteen words in contrast with six in Wolof) but we should remember that the temperature scale that French people experience (which can go below 0°C) is wider than the Senegalese one (which never goes below 17°C). This is exemplified by the French terms like *gelé* ‘freeze’, *glacé* ‘iced’/‘glacial’ ‘icy’, (*se*) *cailler* ‘to curd (oneself)’ and (*se*) *geler* ‘to freeze (oneself)’. Lastly, Wolof has also developed specific and more accurate references relating to degrees of temperature by means of ideophones.

Now concerning the semantic patterns developed by the two languages, I have noted that in French and Wolof, most of the patterns hinge on concepts relating to excitement and nervousness for heat or lack of reaction and quiet for cold.

Nevertheless, French and Wolof polysemous patterns also diverge. Despite the antonymic agreement, the connotations of patterns involving the concept of heat are generally negative in Wolof, whereas they may be positive or negative in French. Conversely, the connotations of patterns involving the notion of cold are generally positive in Wolof and rather negative in French. Moreover, the fact that the notions of enthusiasm and satisfaction (as well as their antonymic correlates) are successively associated with the notion of heat in French and with the notion of cold in Wolof is a curious and interesting phenomenon but difficult to explain. It is as if there were a particular connection between scale of temperature and scale of contentment with no matter how the poles of the two antonymic scales are connected, apart from the cultural symbolism.

As for the hypothesis of a possible influence of culture on the semantics of temperatures terms, this analysis suggests that it seems acceptable given that it is possible to establish correlations between the cultural representations relating to the perception of climate and the semantic behaviour of temperature terms. Nevertheless, culture does not seem to affect the organisation of temperature systems; with the exception of French terms like *gelé* ‘freeze’, *glacial* ‘icy’ justified by a wider range of cold temperatures: this lexical variety is actually the expression of a certain preoccupation with regard to cold temperature. For example, it does not seem possible to draw a parallel between culture and the type of opposition (binary temperature system vs. ternary temperature system) that the organisation hinges on. Moreover, the influence of culture on language seems to be much more significant regarding polysemous

patterns. But, here again, this impact must not be seen as a guiding principle. It is as if the language organises itself following a symbolic consistency but does not hesitate to override this principle whenever a semantic pattern is relevant, as is the case with the Wolof verb *sedd* 'to be/feel cold' which can refer to willingness as in the adverbial expression *ci xol bu sedd* (literally 'in a heart which is cold') and which can also mean 'to be dead'.

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