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**“ISSUES AND MAIZE BREAD TASTE GOOD WHEN THEY’RE COOL”:
TEMPERATURE TERMS AND THEIR METAPHORICAL EXTENSIONS IN
KAMBAATA (CUSHITIC)**

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This paper is an analysis of the basic and extended meanings of temperature lexemes and the grammar of temperature expressions in Kambaata in comparison to related Highland East Cushitic languages of Ethiopia. Globally, Kambaata has a system of two opposing temperature values, ‘cold’ vs. ‘warm/hot’. The lexeme *iib-* ‘be(come) warm/hot’ contrasts with *caal-* ‘be(come) tactile cold’ in the tactile frame of temperature evaluation, while it contrasts with *gid-* ‘be(come) non-tactile cold’ in the domain of ambient (weather) and personal-feeling (inner) temperature. In addition to these central lexemes, Kambaata has a number of terms that are semantically more restricted, are less frequent and/or have an unequivocal positive or negative connotation, including, e.g., *sigg-* ‘be(come) comfortably cold or warm, cool’ and *buss-* ‘burn (tr.); be dangerously, excessively hot’. Irrespective of the temperature value, the expression of personal-feeling temperature is constructionally different from that of ambient temperature and tactile temperature; for the former a transitive, for the latter an intransitive construction is used. As for the extended uses of temperature terms, Kambaata maps warmth/heat onto freshness, busyness, and anger, and links burning heat to anger, spiciness and raging thirst. Unlike many other languages in the world, Kambaata does not relate warmth/heat to affection. Furthermore, Kambaata conceptualizes inactivity, ineptness and fear as tactile cold but the absence of emotional and physical pain as non-tactile cold. Coolness is linked metaphorically to calmness and absence of thirst. In the Highland East Cushitic branch of languages, ‘warm/hot’ is the most stable term, whereas six seemingly non-cognate roots are used for ‘tactile cold’ and/or ‘non-tactile cold’.

Keywords: lexical semantics, temperature, metaphor, Cushitic, Kambaata

1. Introduction

All languages can be assumed to have means of expressing the sensation of heat and cold, as exemplified in examples (1)-(2) from Kambaata,¹ a Highland East Cushitic (HEC) language spoken by more than 600,000 speakers (Central Statistical Agency 2007: 74) in the Kambaata-Xambaaro Zone in the South of Ethiopia.

¹ Iso-code: [ktb](#), glottolog code: [kam1316](#).

- (1) Haláab-u **íib-a-a**
 PN-mNOM warm/hot-mPRED-mCOP2
 (Speaking about the climate of a town in the lowlands) ‘Halaaba is hot.’
- (2) Hangácc-u **gíd-a-a**
 PN-mNOM cold-mPRED-mCOP2
 (Speaking about the climate of a town in the highlands) ‘Hangacca is cold.’

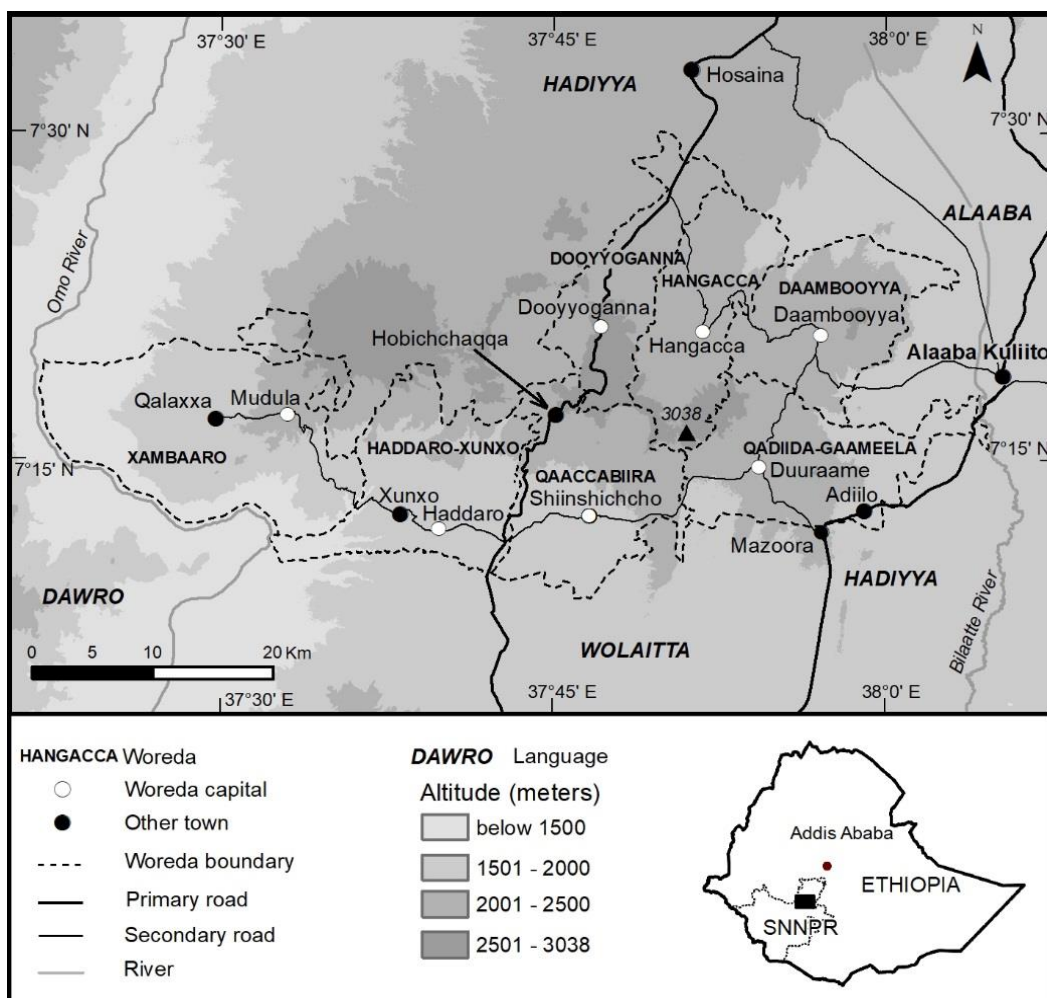
Recent lexical typological works under the direction of Maria Koptjevskaja-Tamm (2015a) have shown that languages differ significantly in:

- how they carve up the lexical field of temperature terms, e.g. some languages have a system of only two temperature values (COLD-HOT), while others distinguish up to five values;
- whether different temperature term systems are used to evaluate different classes of entities, seeing that languages have more elaborate systems for the evaluation of water temperature;
- whether different temperature lexemes (or constructions) are used for tactile, ambient (weather) or personal-feeling (inner) temperature.

No systematic description of temperature terms has so far been attempted for any Ethiopian language, and no Cushitic language has been considered in the existing typological works on the expression of temperature. This paper aims to provide the first detailed empirical account of the semantic and grammatical aspects of temperature expressions in Kambaata. Section 2 provides general background information on word classes and their inflectional potential. Section 3 gives an overview on how the lexical field of temperature terms is structured (§3.1), introduces the reader to the morphological derivation of temperature terms (§3.2), and includes a general note on the citation forms of temperature terms (§3.3). Section 4 discusses the interaction of lexicon and grammar in the expression of temperature. It proceeds from the tactile (§4.1), via the ambient (§4.2), to the personal-feeling frame (§4.3) of temperature evaluation. For each of these frames, we consider which temperature lexemes are used for which evaluated items and spell out the morphological and morphosyntactic characteristics of the different constructions. In Section 5 we turn to the semantic extensions of temperature terms and the conceptual metaphors in which they are used. Section 6 presents the results of a comparative study of temperature terms across the Highland East Cushitic language group; we assemble information on central temperature values, discuss lexicalization patterns and show which terms are cognate across the genetic unit. Section 7 concludes the paper.

The Kambaata zone covers an area whose altitude ranges from below 1500m to above 3000m (Figure 1). The central area of the zone lies at an altitude between 2000m and 2500m. Here the temperatures hardly ever rise above 30°C even during the daytime of the hottest months and never fall below zero during the nights of the coldest months. Very occasionally, ground frost may be observed in areas of very high altitude on the Hambarichcho mountain massif (peak: 3038m).

Figure 1. Map of the Kambaata-Xambaaro Zone and its districts (*woredas*)²



The Kambaata data used for this paper comes from the first author’s fieldwork corpus, a corpus of local publications, including Alemu’s (2016) Kambaata dictionary, and the second author’s native speaker expertise. The data originates predominately from the Qadiida-Gaameela district of the Kambaata-Xambaaro Zone. The collection of supplementary elicited data has been guided and encouraged by Koptjevskaja-Tamm’s temperature questionnaire (2018). If not otherwise indicated, the second author is the source of the examples.

The Kambaata data is transcribed using the official orthography (Treis 2008: 73-80, Alemu 2016), with the addition of accents to indicate phonemic stress. The following graphemes are not in accordance with IPA conventions: <ph> /p’/, <x> /t’/, <q> /k’/, <j> /dʒ/, <c> /tʃ/, <ch> /tʃ/, <sh> /ʃ/, <y> /j/ and <’> /ʔ/. Geminate consonants and long vowels are marked by doubling, e.g. <shsh> /ʃ:/ and <ee> /e:/.

² Map designed by Jérôme Picard, CNRS, LLACAN 2016, Sources: Aster GDEM, a product of METI and NASA; ESRI Data and Maps; Data.humdata.org; all boundaries are unofficial.

2. Morphosyntactic background

Kambaata is agglutinating-fusional and strictly suffixing. Its constituent order is consistently head-final; the final element in a sentence is usually a fully finite main verb or a copula. The following open word classes can be defined on morphosyntactic grounds: nouns, adjectives, verbs, ideophones, and interjections. Kambaata is a nominative-accusative language. The nominative is the subject case; the accusative marks direct objects and certain adverbial constituents, and also serves as the citation form of nouns. Nouns distinguish nine case forms (Table 1) and are marked for two genders (masculine vs. feminine). Nouns are categorized into altogether 21 declensions.

Table 1. Case paradigm of a masculine noun (declension M1 in *-á*) and a feminine noun (declension F2a in *-í-ta*)

Case	<i>gid-á</i> (m.) 'non-tactile cold'	<i>quxal-í-ta</i> (f.) 'bitter ambient cold'
Accusative	<i>gid-á</i>	<i>quxal-í-ta</i>
Nominative	<i>gid-u</i> – cf. (26)	<i>quxál-i-t</i> – cf. (37)
Genitive	<i>gid-í</i>	<i>quxal-é</i>
Dative	<i>gid-íi(-ha)</i>	<i>quxal-ée(-ha ~ -ta)</i>
Ablative	<i>gid-íichch</i>	<i>quxal-éechch</i>
Instrumental/comitative/perlative	<i>gid-íin</i>	<i>quxal-éen</i>
Locative	<i>gid-áan</i> – cf. (44)	<i>quxal-éen</i>
Oblique/vocative	<i>gid-a</i>	<i>quxál-e</i>
Predicative (with COP2)	<i>gid-a</i>	<i>quxál-i</i>

In their prototypical use as modifiers in the NP, members of the word class of adjectives show case and gender agreement with the head noun. In this function, three case forms are distinguished: accusative, nominative and oblique (Table 2). Adjectives fall into five declensions.

Table 2. Case/gender inflection of an adjectival modifier: The example of *iib-á(ta)* 'warm/hot' (declension A1)³

Case form	m	f
Accusative	<i>iib-á</i>	<i>iib-áta</i>
Nominative	<i>íib-u</i>	<i>íib-at</i>
Oblique	<i>íib-a(a)</i>	<i>íib-a(ta)</i>

The oblique form signals agreement with a non-nominative, non-accusative head noun; see *íib-aa* 'warm/hot' before the locative noun in (3).

³ All temperature adjectives discussed in this paper are members of A1, the largest adjectival declension (Treis 2008: 256).

- (3) Ku háqq-u **ĩib-aa** baad-óon
 A_DEM1.mNOM tree-mNOM warm/hot-mOBL land-mLOC
 xall-áan le'-áno-a
 only-mLOC grow-3mIPV.REL-mCOP2
 'This tree (species) only grows in hot countries (/areas).'

An adjective can also function as the head of an NP. As such, it has the same case-marking potential as a noun and is marked for one of the nine nominal cases (Table 1). As NP head, the adjective adopts the gender of the omitted head noun; in (4), the adjective *caal-á* 'tactile cold' is masculine because the missing head noun, *mirind-á* (m) 'type of soft drink', is masculine. See also *iib-á* 'warm/hot (one)' in (13) and *sigg-á-s* 'the cool (one)' in (17).

- (4) A: Híkka mirind-á aat-tá'nne?
 A_DEM1.mACC drink_sp-mACC give-2fICO<1sO>
 'Can you pass on that Mirinda (= soft drink) to me?'
 B: Hákka-s?
 which.mACC-DEF
 'Which one?'
 A: **Caal-á** áass-e'e
 Tactile_cold-mACC give-2sIMP-1sO
 'Give me the cold (one)!'

Adjectival predicates agree with their subject in gender, are marked for the predicative case and combine with the copula *-(h)a(a)* (mCOP2) / *-ta(a)* (fCOP2) (1).

Kambaata has not only a large class of basic adjectival lexemes but also several productive derivational mechanisms to create adjectives on the basis of nouns, verbs and ideophones, i.e. the proprietive, agentive, resultative, privative, approximative and similitive derivations (Table 3).

Table 3. Adjectival derivations

Derivation	Morphological structure	Example
Proprietary	Noun- <i>aam</i> -Case+Gender	e.g. <i>orc-á</i> 'mud' > <i>orc-aam-ú/-íta</i> 'muddy'
Agentive	Verb/Noun- <i>aan</i> -Number-Case+Gender	e.g. <i>dimb-</i> 'be(come) drunk' > <i>dimb-aan-ch-ú(ta)</i> 'drunkard'
Resultative	Ideophone- <i>eem</i> -Case+Gender	e.g. <i>dákk=y-</i> 'be hidden' > <i>dakk-eem-á(ta)</i> 'hidden'
Privative	Noun- <i>beel</i> -Case+Gender	e.g. <i>wozan-á</i> 'heart' > <i>wozan-beel-ú(ta)</i> 'forgetful (lit. heartless)'
Approximative	Adjective/Verb/Noun- <i>lab</i> -Case+Gender	e.g. <i>mux-á(ta)</i> 'wet' > <i>mux-(i)lab-á(ta)</i> 'a bit wet'
Similitive	Noun- <i>agud</i> -Case+Gender	e.g. <i>bun-á</i> 'coffee' > <i>bun-agud-á(ta)</i> 'coffee-like/-colored'; cf. also (47)

All verbs apart from verbal nouns carry subject indexes. Furthermore, verbs inflect for aspect (imperfective, perfective, perfect, progressive), mood (declarative, imperative, jussive, benedictive, apprehensive), polarity (affirmative, negative) and dependency status (main verbs, relative verbs, converbs – see e.g. the final perfective main verb, marked PFV, and the perfective converb, marked PCO, in (5)). Direct and indirect objects can optionally be expressed by suffixed pronouns at the right edge of the inflected verb; see *-se* 3fO ‘her’ in (5). The expression of temperature experiencers as accusative object pronouns is discussed in §4.3.1.

- (5) (...) fiit-ichch-óoha-n-s **sigg-á** wo’-á
 flower-SG-fDAT-L-3mPOSS cool-mACC water-mACC
 éebb-i=ké’ ag-íshsh-o-se
 bring-3mPCO=SEQ drink-CAUS1-3mPFV-3fO
 ‘(...) he brought fresh (/cool) water for his flower and watered it (lit. her).’ (Saint-Exupéry 2018: 31)

For the ensuing discussion it is important to keep in mind that all simple, underived adjectival stems in the language have a corresponding inchoative-stative property verb of the same root, e.g. *caal*-Case+Gender [ADJ] ‘tactile cold’ – *caal*-Subject+TAM [V] ‘be(come) tactile cold’. It is still unclear whether one should assume that adjectives are derived from inchoative-stative verbs (or vice versa) through conversion, or that the word class of property concepts is not predetermined, allowing for both adjectival and verbal inflection (Treis 2008: 269).

3. Temperature term system

Section 3.1 gives an overview of how the lexical field of temperature terms is structured and introduces a distinction between domain-central and domain-peripheral terms. The morphological derivation of temperature terms is addressed in §3.2. A note on the citation forms of temperature terms is provided in §3.3.

3.1. Lexical field. The three domain-central temperature terms (in the sense of Koptjevskaja-Tamm 2015b: 27) are systematized in Table 4, where Kambaata is seen to have a system of two opposing temperature values, ‘cold’ vs. ‘warm/hot’.⁴ The domain-central terms are most semantically unmarked, minimally restricted, most frequently occurring and without inherent positive or negative connotation. Koptjevskaja-Tamm (2015b: 13) distinguishes three main frames (i.e. kinds) of temperature evaluation: (i) tactile: evaluation of the temperature of other entities through touching, (ii) ambient: evaluation of the atmospheric/air temperature and (iii) personal-feeling: evaluation of one’s own thermal comfort. In the cold domain, Kambaata displays a frame-specific opposition between ‘tactile cold’ and ‘non-tactile (= ambient and personal-feeling) cold’. As elaborated in §4, the expression of personal-feeling temperature is – both in the cold and hot domains – constructionally different from the expression of ambient temperature, even though the lexemes are shared in the two frames. For the expression of tactile and ambient temperature both adjectival and verbal forms can be used, while personal-feeling temperature only allows a verbal construction, namely an underived verb form in the cold domain and a causativized verb form in the hot domain.

⁴ We have chosen to translate *iib-á(ta)*, i.e. the lexeme that opposes ‘cold’, not simply as ‘hot’ but as ‘warm/hot’, in order to signal that it is semantically broader than English *hot* (see discussion below).

Table 4. Domain-central temperature terms

‘cold’	‘warm/hot’	Frame of evaluation
<i>caal-á(ta)</i> [ADJ]~ <i>caal</i> -[V]	<i>iib-á(ta)</i> [ADJ]~ <i>iibl</i> -[V]	TACTILE
<i>gid-á(ta)</i> [ADJ]~ <i>gid</i> -[V]		AMBIENT
<i>gid</i> -[V]+DO _{experiencer}	<i>iibb-is</i> -[V-CAUS1] +DO _{experiencer}	PERSONAL-FEELING

Apart from the three central temperature terms given in Table 4, a handful of terms exist that are (slightly or significantly) more peripheral to the temperature domain (Table 5). The first two terms in Table 5 are frequently attested in our database and widely applicable but always have an inherently negative or positive connotation. We must admit that our decision not to consider these terms as domain-central is tentative. The inclusion of *buss*- [V] and *sigg-á(ta)* [ADJ] ~ *sigg*- [V] into the domain-central terms would significantly alter the typological categorization of Kambaata and make it a language with a four-value rather than a two-value temperature system. The terms below the bold line in Table 5 can indisputably be considered domain-peripheral, as they are infrequently attested and are restricted in their applicability, as shown in §4.1.

Table 5. Domain-peripheral temperature terms

Domain-peripheral terms	Translation	Section
<i>buss</i> - [V]	‘[tactile] burn (tr.); be dangerously, excessively hot’	§4.1.2.1
<i>sigg-á(ta)</i> [ADJ] ~ <i>sigg</i> - [V]	‘[tactile, ambient] comfortably cold or warm, cool’	§4.1.2.2 + §4.2.2.2
<i>gummuut-á(ta)</i> [ADJ] ~ <i>gummuut</i> - [V]	‘[tactile, of liquids] lukewarm’	§4.1.2.3
<i>gic-á(ta)</i> [ADJ] ~ <i>gic</i> - [V]	‘[tactile, of fire] not burning properly, not hot (enough), not (too) hot’	§4.1.2.3
<i>qabad-á(ta)</i> [ADJ] ~ <i>qabad</i> - [V]	‘[tactile] extremely cold’	§4.1.2.4
<i>quxal-íta</i> [N] ~ <i>quxal</i> - [V]	‘[ambient] bitterly cold’	§4.2.2.3
<i>faar-á</i> [N] ~ <i>faar</i> - [V]	‘[tactile, ambient] extremely hot’	§4.1.2.1, §4.2.2.1

Kambaata seems to have no domain-peripheral terms for personal-feeling temperature.⁵

A dedicated onomatopoeic interjection, *hatatá*, expresses that the speaker is freezing cold (6) (see also Alemu 2016: 454).⁶ There is no dedicated interjection for when one feels terribly hot.

⁵ This would confirm Koptjevskaja-Tamm’s hierarchy of temperature elaboration (2015b: 19), where the lexical field of personal-feeling is assumed to be the least elaborated.

⁶ In the neighboring language of Hadiyya, the corresponding interjection is *hatitta* (Dilamo Markos p.c. 2019, correcting the entry *hadíd* from Plazikowsky-Brauner 1964: 155). To the best of our knowledge, cold and heat interjections have not yet been systematically examined cross-linguistically.

- (6) Haml-áan **hatatá** y-ee'í-i
 July-mLOC INTJ say-3mPFV.REL-NMZ1.mNOM
 haag-úun haat-úta qulx-áno
 dry_season-mLOC roasted_grain-fACC long_for-3mIPV
 'The one who says "brrr" in July (= coldest month in Kambaata) longs for roasted grain
 in the dry season.' (Alamu & Alamaayyo 2017: 70)

3.2. Morphological derivation. None of the temperature adjectives introduced in Tables 4 and 5 are the result of derivation; they are all morphologically simple. So far we have only come across two derived temperature adjectives: Alemu (2016: 865) lists the propriative adjective *quxal-aam-ú* (f: *quxal-aam-íta*) 'bitterly ambient cold', based on the noun *quxal-íta* (f) 'bitter ambient cold' (see Table 1 and §4.2.2.3). Furthermore, simple temperature adjectives can be the input of the approximative derivation, e.g. *iib-á(ta)* 'warm/hot' > *iib-(i)lab-á(ta)* 'slightly hot, warmish', which has an attenuating function on property lexemes.

The morphological simplicity of Kambaata temperature adjectives is noteworthy because cognate adjectives in related HEC languages may be derived (§6).

The temperature adjectives of §3.1 have corresponding temperature nouns (Table 6), which fall into two groups: (i) nouns that are based on the same stem as the corresponding adjectives and only differ from them with respect to their inflectional morphology – see 'warm/hot' and 'non-tactile cold', and (ii) nouns that are derived from temperature adjectives by the productive quality noun derivation *-im*. The derived quality nouns end in *-áta* (declension F1a) in their citation form (Treis 2008: 154f).

Table 6. Temperature adjectives and their corresponding nouns

Adjective	Translation	Noun	Translation	Ex.
<i>iib-á(ta)</i>	'warm/hot'	<i>iib-á</i>	'warmth/heat; fever'	(8)
<i>gid-á(ta)</i>	'[non-tactile] cold'	<i>gid-á</i>	'[non-tactile] cold'	(50)
<i>caal-á(ta)</i>	'[tactile] cold'	<i>caal-im-áta</i>	'[tactile] cold'	(7)
<i>sigg-á(ta)</i>	'[tactile, ambient] comfortably cold or warm, cool'	<i>sigg-im-áta</i>	'[tactile, ambient] comfortably cold or warm temperature, coolness'	
<i>gummuut-á(ta)</i>	'[tactile, of liquids] lukewarm'	<i>gummuut-im-áta</i>	'[tactile, of liquids] lukewarmth'	(7)
<i>gic-á(ta)</i>	'[tactile, of fire] not hot (enough), not (too) hot'	<i>gic-im-áta</i>	'[tactile, of fire] insufficient, reduced heat'	
<i>qabad-á(ta)</i>	'[tactile] extremely cold'	<i>qabad-im-áta</i>	'[tactile] extreme cold'	

The use of temperature nouns is exemplified in (7) and (8).

- (7) Ka ciil-á aansh-itú'nna m-íi-ma
 A_DEM1.mACC infant-mACC wash.CAUS1-2fNEG4 what-mDAT-PRAG4
 dás-si-la? Wó'u **gummuut-im-áachch**
 be_late-2fPCO-PRAG2 water-mNOM lukewarm-QU-fABL
caal-im-á=b-a door-ámm
 tactile_cold-QU-fGEN=PLC-mACC change-PASS.3mPCO
 fajj-óo-'nnu?
 leave-3mPFV.VV-PRAG3
 'Why did it take you so long before you (were ready to) wash the child? The water has
 (now) turned from being lukewarm to being tactile cold, hasn't it?'
- (8) Iitt-itúmb-u-a **iib-ahá-a** arriichch-uhá-a
 love-2sNEG5-mPRED-mCOP2 warmth/heat-mACC-ADD sunlight.SG-mACC-ADD
 (Verse from a poem) 'You (m) (= the enset plant)⁷ are someone who doesn't like the heat
 and the sun.' (Geetaahun 2002: 216)

All but one of the temperature verbs presented in §3.1 are morphologically simple. The verb *buss-* 'burn (tr.); be dangerously, excessively hot' (Table 5) is the simple causative derivation of the verb *bub-* 'burn (itr.)', which is itself not used for the expression of temperature. In the formation of *buss-*, the morpheme *-(i)s* (CAUS1) assimilates to the stem-final consonant of the root *bub-*, i.e. **bub-s-* > *buss-*.

In the same way as all other inchoative-stative property verbs, the morphologically simple temperature verbs in Tables 4 and 5 can be extended by the causative derivation *-(i)s* (CAUS1). The resulting forms display certain phonological and semantic irregularities, which is a common feature of the Kambaata causative derivation in general. In (9), the use of *caal-s-* 'make tactile cold', derived form of *caal-* 'be(come) tactile cold', is exemplified.

- (9) Ku cíil-u shah-éen wo'-á wórr
 A_DEM1.mNOM infant-mNOM tea-fLOC water-mACC put_in.3mPCO
caal-s-í kámm-o
 be(come)_tactile_cold-CAUS1-3mPCO do_completely-3mPFV
 'The child poured water into the tea and cooled it.'

Regarding the causative form of *iib-* 'be(come) warm/hot', *iibb-is-* 'warm/heat (tr.)', it is worth nothing that the root-final consonant of the derived form is geminate (*bb*).⁸ Causativized temperature verbs also allow for an additional middle extension, which is marked by *-'* / *-aqq* and has a reflexive or benefactive reading; see *iibb-is-* CAUS1 'warm/heat (something)' > *iibb-icc-* CAUS1.MID (i) 'warm/heat oneself up' (10), (ii) 'warm/heat (something) for oneself' (11). Note that *-is* CAUS1 + *-'* MID results in *-icc* according to a regular morphophonological rule.

⁷ *Waas-á* (m) 'enset' (*Ensete ventricosum*) is a food plant cultivated in the highlands of southern Ethiopia.

⁸ Diachronically, the underived form has probably degeminated from *bb* to *b* (§6).

- (10) Pheextróos-i-n isso'óoni-n barg-ámm uurr-í
 PN-mNOM-N 3pICP-N add-PASS.3mPCO stand-3mPCO
iibb-icc-áyyoo íkke
 be(come)_warm/hot-CAUS1.MID-3mPROG PST
 'And Peter stood with them and warmed himself (by the fire).' (John 18: 18)
- (11) Hítt gíir-a-s ful-táa lám-it
 A_DEM2.fNOM fire-fNOM-DEF go_out-3fIPV.REL two-fNOM
 dúun-n-at (...) qurs-á-s
 mountain-PL1-fNOM breakfast-mACC-3mPOSS
iibb-icc-íi abb-ís-s
 be(come)_warm/hot-CAUS1.MID-mDAT be(come)_much-CAUS1-3fPCO
 kaa'll-itáa-si-ta íkke
 help-3fIPV-3mO.REL-fCOP2 PST
 'These two volcanoes (lit. mountains from which the fire goes out) were useful for him to heat up his breakfast.' (Saint-Exupéry 2018: 34)

The use of causative temperature terms is illustrated in §4.3.1 for personal-feeling temperature and in §§5.1.2-4 and §§5.2.4-6 for the extended uses of temperature terms.

3.3. Citation forms. The following notation conventions are applied for the presentation of data in the running text: Adjectives are cited in their masculine accusative form, with the feminine marker added in brackets, e.g. *sigg-á(ta)* 'comfortably cold or warm, cool'; inflectional and derivational morphology is always separated from the stem by a hyphen. Verbs are cited as roots or stems without inflectional morphology, e.g. *buss-* 'burn (tr.); be dangerously, excessively hot'. Nouns are given in their accusative form, e.g. *gid-á* (m) 'non-tactile cold' and *caal-im-áta* (f) 'tactile cold'. As mentioned in §2, all underived adjectives have corresponding inchoative-stative property verbs of the same root; the former take gender/case morphology, while the latter are marked for aspect, mood, polarity and dependency status, and are indexed for the subject. If reference is made to a temperature lexeme irrespective of its realization as adjective or verb, the lengthy citation forms found in Table 4 and 5, e.g. *iib-á(ta)* [ADJ] 'warm/hot' ~ *iib-* [V] 'be(come) warm/hot', are replaced by a citation form in small capital letters, e.g. *IIB-* 'warm/hot'.

4. Lexicon-grammar interaction in the expression of temperature

This section brings together information on the lexicon-grammar interaction in the expression of temperature. It investigates which simple or derived temperature terms and which morphosyntactic constructions are used in which frames of temperature evaluation. We proceed from the tactile (§4.1), via the ambient (§4.2) to the (constructionally most diversified) personal-feeling frame of temperature evaluation.

4.1. Tactile temperature. The construction for the expression of tactile temperature is schematized in Table 7.

Table 7. Tactile temperature construction

SBJ _{thing}	Predicate	
	‘tactile cold’ <i>caal-á(ta)</i> [ADJ] ~ <i>caal-</i> [V]	‘warm/hot’ <i>iib-á(ta)</i> [ADJ] ~ <i>iib-</i> [V]

4.1.1. Domain-central temperature terms. In the frame of tactile evaluation, the lexeme *IIB-* ‘warm/hot’ is in opposition to *CAAL-* ‘tactile cold’, as seen in (12)-(13).

- (12) A: Kóo, kú-s m-á cáall
 2mVOC A_DEM1.mNOM-DEF what-mACC be(come)_tactile_cold.3mPCO
 bá’-ee-haa kín-u-la!
 get_lost-3mPRF.REL-mCOP2 stone-mPRED-PRAG1
 (A and B are looking for stones on which to rest) ‘Hey, this stone is terribly cold (lit. this is what (kind of) lost⁹-cold stone)!’
- B: Ku kín-u íib-a-a,
 A_DEM1.mNOM stone-mNOM warm/hot-mPRED-mCOP2
 isóon-ta-s afúu’lI-i
 3mLOC-L-DEF sit-2sIMP
 ‘This stone (here with me) is warm, sit on this one (lit. him).’

- (13) **Caal-á** wo’-á has-soontí=da gamball-á
 tactile_cold-mACC water-mACC want-2sPFV.REL=COND black-mACC
 úl-i, **iib-á** has-soontí=da ammóo
 touch-2sIMP warm/hot-mACC want-2sPFV.REL=COND however
 biishsh-á-s úl-i
 red-mACC-DEF touch-2sIMP
 (Speaker explaining the use of a wash-basin) ‘If you want cold water, use the blue (lit. black) (tap), if you want hot (water) use the red (tap).’

IIB- ‘warm/hot’ is also opposed to *CAAL-* ‘tactile cold’ when one speaks about hot and cold dishes and drinks.

4.1.2. Domain-peripheral temperature terms. Apart from the two domain-central lexemes for tactile evaluation, Kambaata has several lexemes that we interpret as domain-peripheral – either because they are only applied to a certain category of objects, because they are inherently positive or negative, or because they are rare and only used when temperatures are extreme.

⁹ The verb *ba’-* ‘get lost’ has grammaticalized into an intensifier; it is not restricted to temperature terms.

4.1.2.1 Dangerously hot. If the temperature of an object is extreme and a person touching this object risks being injured, the object is qualified with the verb *buss-* ‘burn; be dangerously, excessively hot’ (14). The same verb is used to qualify the body of a child with fever (15).

- (14) **Buss-itáa** dist-íta táff=a’-í-yan
 burn.CAUS1-3fIPV.REL pot-fACC touch=do-1sPCO-DS
 ang-á-’i giir-tóo-’e
 hand-fACC-1sPOSS burn-3fPFV-1sO
 ‘I touched a hot (lit. burning) pot and burnt my hand.’

- (15) Ka ciil-í ál-u **buss-áyyoo’u** (*bub-áyyoo’u)
 A_DEM1.mOBL child-mGEN body-mNOM burn.*(CAUS1)-3mPROG
 ‘This child is hot (lit. this child’s body is burning).’

The verb *buss-* ‘burn; be dangerously, excessively hot’ is the causative derivation of the verb *bub-* ‘burn (itr.)’, which is itself not used for the expression of temperature and is considered unacceptable in contexts such as (14)-(15). Although the experiencer is not overtly expressed as the direct object argument of *buss-* in (14)-(15), it can be assumed to be the implicit object of the transitive verb. Unlike all other temperature terms discussed in this paper, no corresponding adjectival form exists for the temperature verb *buss-*; accordingly, a relative verb form needs to be used when the temperature term functions as an NP modifier (14).¹⁰

Given that the verb *buss-* is still commonly used with the source meaning ‘burn (tr.)’, (16), one could question our decision to regard this lexeme as a genuine temperature term, but the decision is based on the observation that the verb is found in opposition to and in the same contexts as other temperature terms.

- (16) Billaww-á aphph-ití-i xit-á
 knife-mACC hold.MID-3fPCO-ADD soot-mACC
buss-ití-i ful-táa’u
 burn.CAUS1-3fPCO-ADD go_out-3fIPV
 ‘Holding a knife and burning (a tuft of grass smeared with) soot, she (= the new mother) goes out (to the toilet).’ (EK2016-02-23)

In (17), *buss-* contrasts with the temperature term *sigg-á(ta)* ‘comfortably cold or warm, cool’ (§4.1.2.2) in an exchange between a child (A) and its mother (B). Both ‘burn (tr.); be dangerously, excessively hot’ and ‘cool’ are used as NP heads in (17). As a verb, *buss-* needs to be nominalized in this context, while the adjective *sigg-á(ta)* can be used as NP head without any morphological measures being taken.

¹⁰ Cross-linguistically, it is not uncommon for languages to have temperature systems that encompass terms from different word classes (Koptjevskaja-Tamm 2015b: 3).

- (17) A: Lam-ínta dist-íta áff dand-aam-ba'ii-'nnu
 two-fACC<N> pot-fACC take.1sPCO can-1sIPV-NEG1.VV-PRAG3
 'I cannot carry both pots!'
- B: Wáashsh-i! **Buss-ítaa-sí-íta** án
 bring-2sIMP burn.CAUS1-3fIPV-DEF.REL-NMZ1.fACC 1sNOM
 af-áan-ke, **sigg-á-s** áti-n áf-i
 take-1sIPV-2sO cool-mACC-DEF 2sNOM-N take-2sIMP
 'Give (it to me)! I carry the (dangerously) hot one for you, and you carry the one that
 has cooled down.'

Apart from *buss-* 'burn (tr.); be dangerously excessively hot', we also find the noun *faar-á* (m) 'boiling, extremely hot thing' in our data. This lexeme is used to characterize drinks as having a temperature that even exceeds a state describable by *buss-*; see the hyperbolic exclamation in (18). The noun *faar-á* shares the root with the verb *faar-* 'boil (e.g. of water, coffee)'. The verb is seen in (19) in a statement about an alarmingly high fever; compare this example with (15).

- (18) Ka **faar-á** hátt=a'-í
 A_DEM1.mACC boiling_thing-mACC how.IDEO=do-3mPCO
 ágg xóoff-o-la!?
 drink.3mPCO finish-3mPFV-PRAG1
 (Speaker is surprised that a child has finished a hot drink so quickly and calls out): 'How
 quickly has he finished drinking this boiling thing!?'
- (19) Kánn ciil-í ál-u **faar-áyyoo'u**
 A_DEM1.mOBL infant-mGEN body-mNOM boil-3mPROG
 'This child has very high fever (lit. this child's body is boiling).'

4.1.2.2 Comfortably cold or warm.¹¹ The lexeme *SIGG-* has an unequivocally positive connotation. In order to keep the glosses simple, it is translated as 'cool' in the examples, even though *SIGG-* should not simply be equated with English *cool*. The Kambaata term cannot always be paraphrased as 'slightly cold'. Instead, it is most appropriately translated as 'cooled down sufficiently (for handling, use, consumption), comfortably warm; comfortably cold, refreshing; of a pleasant temperature'. The examples show that *SIGG-* is used for temperatures at the cold and hot end of the scale: In (5) it designates the temperature of refreshing water that has just been fetched from a well. In (17) it expresses the temperature of a cooking pot, which has cooled down sufficiently so as not to be dangerous for a child. *SIGG-* characterizes food (e.g. soup) or drink (e.g. tea) that, having been heated on the fire, has cooled down sufficiently to be eaten or drunk without burning the tongue (20). In (17) and (20), *SIGG-* is in opposition to a lexeme expressing extreme heat, whereas (5) contains an implicit contrast to lukewarm water.

¹¹ In our analysis of a corpus of local publications, we noted that the lexeme *SIGG-* 'comfortably cold or warm, cool' is not attested in publications from northern Kambaata, neither in its basic nor its extended uses (see especially Geetaahun 2002 and Brook & Yonathan 2013). Instead, *GID-* 'non-tactile cold' occurs where we would have expected *SIGG-*. It would be interesting to investigate whether dialectal differences in the use and meaning of temperature terms occur across the Kambaata-speaking area.

- (20) A: Ī shah-íta
 take_from_speaker's_hands.2sIMP tea-fACC
 'Here, take (this) tea!'
- B: Ka faar-á hátt=a'-ámami-la?
 A_DEM1.mACC boiling_thing-mACC how.IDEO=do-1sIPV-PRAG1
 afúushsh-i, **sigg-ítun**
 put_down-2sIMP become_cool-3fJUS
 'How can I handle this boiling thing?! Put it here and let it (first) cool down (a bit).'

If food and drink that are meant to be consumed warm or hot have cooled down too much and are no longer pleasant to consume, they are characterized as *CAAL-* 'tactile cold' (§4.1.1) or *QABAD-* 'extremely tactile cold' (§4.1.2.4); the positive *SIGG-* would be misplaced in this context. In our corpus, *SIGG-* 'cool' is not limited to a particular type of object. It can qualify the temperature of refreshingly cool water, warm/hot (as opposed to dangerously hot) food, drinks and cooking utensils; shady, cool places; and people's bodies. In Kambaata school textbooks, the causative verb *sigg-is-* 'cool (tr.)' is commonly used in the context of refrigeration.

In contrast to the equivocally positive *SIGG-* 'comfortably cold or warm, cool', the temperature terms that we consider domain-central (§4.1.1) are attested in both positive and negative contexts; see, for instance, that *CAAL-* 'tactile cold' is used for a positively cold entity in (4) and for a negatively cold entity in (12).

4.1.2.3 Lukewarm. We know of two terms for medium temperature in Kambaata. The lexeme *GUMMUUT-* 'lukewarm, tepid' is only used for liquids – as the monolingual definition in Alemu (2016) confirms.

- (21) dun-am-aa[n]-ch-ú ík
 pour-PASS-AG-SG-mACC become.3mPCO
caal-í gardab-íich hígg iiib-á
 cold-mGEN level-mABL pass.3mPCO warm/hot-mACC
 (Definition of *gummuut-á* 'lukewarm, tepid') 'If it is a liquid (lit. being something that is poured), (it means) warm, having passed the cold level.' (Alemu 2016: 401; translation, segmentation, glosses and stress marks ours)

Babies can be washed with lukewarm water, *gummúut-a(a) wo'-íin* {lukewarm-mOBL water-mICP}. Tea that one has forgotten to drink and beer that has been out of the fridge for too long are lukewarm (22)-(23).

- (22) Shah-í-'i ag-ú'nna hább agúrr-i-yan
 tea-fACC-1sPOSS drink-1sNEG4 forget.1sPCO leave-1sPCO-DS
gummúut-t fad-dóo'u
 be(come)_lukewarm-3fPCO do_completely-3fPFV
 'I completely forgot to drink my tea, now it's lukewarm.'

- (23) Firiij-íichch mát-o saat-í qunx-íichch bir-íta
 fridge-mABL one-mOBL hour-mGEN about-mABL front-fACC
 fushsh-inoommí bíir-u tées-u
 take_out-1sPFV.REL beer-mNOM now-mOBL
gummúuchch fájj-ee'u
 be(come)_lukewarm.3mPCO do_completely-3mPRF
 'The beer that we took out of the fridge about an hour ago is now lukewarm.'

The second lexeme expressing medium temperature, *GIC-* 'not burning properly, not hot (enough), not (too) hot', is primarily used for the fire, but also attested with objects that are placed on the fire, e.g. the griddle (*mixaad-ú* m.) on which bread is baked and grain is roasted. *GIC-* usually implies that the fire was properly burning and sufficiently hot before but is no longer, so its connotation is often negative. However, it can have a positive connotation in a context where cooking over a small flame is advisable (24).

- (24) Gíir-at qah-úinka **gíc-cun,**
 fire-fNOM small-mACC<N> be(come)_not_too_hot-3fJUS
 xorósh-u huruur-ókkoo'u
 maize_bread-mNOM turn_black-3mAPPR
 'The fire shouldn't be too hot, (otherwise) the maize bread might turn black.'

It is difficult to decide whether *GIC-* should be considered a true temperature term or as a verb expressing a type of burning¹² – more data is required to answer this question. Note that, in §5, terms for hot temperature and burning have the same metaphorical extensions.

4.1.2.4 Extremely cold. The lexeme *QABAD-* 'extremely tactile cold, uncomfortably tactile cold, too tactile cold (e.g. for consumption)' qualifies the cold of an object as extreme and has a negative connotation. It is used in the context of food that needs to be reheated before consumption (25), feet that are ice-cold because they were not kept under the blanket at night (26) or hands that are numb after playing with hail.

- (25) Ku wáas-u **qabájj-ee'u,**
 A_DEM1.mNOM enset_bread-mNOM be(come)_extremely_cold-3mPRF
 quum-u'nnáan it-is-áno-ba'a
 steam_on_griddle-3mNEG4 eat-CAUS1-3mIPV-NEG1
 'This enset bread is too cold (to eat), it is inedible (lit. it does not make eat) unless it is reheated (on the griddle).'
- (26) Anka'rr-ó gíd-u lokk-á-'i
 last_night-fGEN non_tactile_cold-mNOM feet-fACC-1sPOSS
qabad-íshsh gashsh-ée'u
 be(come)_extremely_cold-CAUS1.3mPCO pass_the_night.CAUS1-3mPRF
 'Last night's cold made me pass the night with ice-cold feet.'

¹² Alemu (2016: 371) defines *gic-* as a type of burning: *giiráta ikk léelan búb-* 'if it is a fire, (it means) burn slowly' (English translation and stress marking ours).

4.2. Ambient temperature. The construction for the expression of ambient temperature is schematized in Table 8.

Table 8. Ambient temperature construction

SBJ _∅ ~ SBJ _{place/time}	Predicate	
	‘non-tactile cold’ <i>gid-á(ta)</i> [ADJ] ~ <i>gid-</i> [V]	‘warm/hot’ <i>iib-á(ta)</i> [ADJ] ~ <i>iib-</i> [V]

4.2.1. Domain-central temperature terms. In the frame of ambient evaluation, the lexeme *iib-* ‘warm/hot’ (27)-(28) is in opposition to *gid-* ‘non-tactile cold’ (Table 8). Kambaata makes a distinction between ‘tactile cold’ and ‘non-tactile (= ambient, personal-feeling) cold’ but not between ‘tactile warm/hot’ and ‘non-tactile warm/hot’. If the ambient temperature term is the predicate, the subject slot can either be empty (27) or occupied by the polysemous noun *ir-á* ‘land, farm, area; weather, (atmospheric, political) situation; time, occasion’ (28).

(27) Arrfíich-ut ful-táa j-áata **iib-áno**
sun.SG-fNOM come_out-3fIPV.REL time-fACC be(come)warm/hot-3mIPV
‘When the sun comes out, (it) gets warm.’ (Kambaatissata 1989: 2.49)

(28) Kabar-é ír-u **iib-a-a**
today-mGEN land-mNOM warm/hot-mPRED-COP2
‘It’s hot today (lit. today’s land is hot).’

Alternatively, the subject slot of an ambient temperature expression can be filled with a place name (1)-(2), a common place noun such as *baad-ú* ‘country’ or *min-í* ‘house’ (29), a place nominalization (30), or a temporal noun such as *sann-á* ‘week’ (31), *max-óo* ‘rainy season’, *hag-úu* ‘dry season’ or the names of the months. Regarding (29), it is important to point out that the use of *CAAL-* ‘tactile cold’ with *min-í* ‘house’ is not excluded. Note, however, that a house qualified as *GID-* ‘non-tactile cold’ has necessarily a cold room temperature, whereas a house described as *CAAL-* ‘tactile cold’ would have something cold about it, for instance, a cold floor.

(29) A: Ku mín-u m-í
A_DEM1.mNOM house-mNOM what-mDAT
gid-áyyoo’u?
be(come)_non_tactile_cold-3mPROG
‘Why is it (so) cold in this house (lit. why is this house (ambient) cold)?’
B: Án maskoot-á fánn-i-yane-et
1sNOM window-mACC open-1sPCO-DS-COP3
‘It’s (because) I have opened the window.’

- (30) Ku át he'-aantf=b-eechch-u
 A_DEM1.mNOM 2sNOM live-2sIPV.REL=PLC-SG-mNOM
 abb-íshsh-i=ké'
 be(come)_much-CAUS1-3mPCO=SEQ
gid-áno-a
 be(come)_non_tactile_cold-3mIPV.REL-mCOP2
 'It is very cold where you live (lit. this place where you live is one which is very cold).'
 (Saint-Exupéry 2018: 32)
- (31) Sánn-unku-s **gid-a-a,**
 week-mNOM<N>-DEF non_tactile_cold-mPRED-mCOP2
 kabár-e-et xáll-a-ba'a
 today-mOBL-COP3 only-mOBL-NEG1
 'The (whole) week was cold, not only today.'

Furthermore, in (32) we see that wind, a factor that decisively influences the ambient temperature, is not characterized as *CAAL*- 'tactile cold' but as *GID*- 'non-tactile cold'. As the verbal temperature term is used as a modifier to *bobir-á* 'wind' in (32), it occurs in a relative verb form.

- (32) Hád-a abb-íshsh
 outside-fOBL be(come)_much-CAUS1.3mPCO
gid-áyyoo
 be(come)_non_tactile_cold-3mPROG.REL
 bobir-á bobir-s-áyyoo'u, min-i-sí áaz-u
 wind-mACC wind-CAUS1-3mPROG house-mGEN-DEF interior-mNOM
 ammóo íbb cúlu=ass-áyyoo'u
 however be(come)_warm/hot.3mPCO nice.IDEO=do-3mPROG
 'Outside a very cold wind (lit. a wind which is being non-tactile cold) is blowing, but in the house it is nice and warm.'

In the frame of ambient evaluation, Koptjevskaja-Tamm (2015b: 16) makes a distinction between non-referential ambient temperature, in which no reference is made to any participant of the temperature event, and quasi-referential ambient temperature, that makes reference to places and times. In Kambaata the ambient temperature expressions with an empty-subject (27) are non-referential, while the other examples quoted in this section can be categorized as quasi-referential.

4.2.2. Domain-peripheral temperature terms. In the frame of ambient evaluation, it is not common to find examples with lexemes other than *IIB*- 'warm/hot' and *GID*- 'non-tactile cold', even though these are by far the most central terms.

4.2.2.1 Dangerously hot. In statements about extreme heat we find the lexemes already encountered in the tactile frame of evaluation, *faar-á* (m) 'boiling, extremely hot thing' and *buss-* 'burn; be dangerously, excessively hot' (§4.1.2.1) (33).

- (33) A: Ka'íin ír-u hattíg-o-ot?
P_DEM3.mICP land-mNOM how-mOBL-COP3
Nii=b-eechch-íin xeen-á ub-áyyoo'u
1pGEN=PLC-SG-mICP rain-mACC fall-3mPROG
(Context: A and B talking over the phone) 'How is the weather (lit. land) on the other
(side)? In our area it is raining (lit. (it) is falling rain).'
- B: Kám kú=b-u
INTJ A_DEM1.mNOM=PLC-mNOM
fáar-a-a, arríichch-u m-íi
boiling_thing-mPRED-mCOP2 sun.SG-mNOM what-mGEN
qax-á-ndo **buss-áyyoo'u**
extent-mACC-Q burn-3mPROG
'Gee, here it's boiling (lit. this place is something boiling), the sun is burning hot (lit.
to what extent burning)!'

We are hesitant to interpret *buss-* in (33) as expressing ambient temperature; rather, it seems that it is used here with its source meaning 'burn (tr.)', with the subject *arríichch-u* (mNOM) 'sun' as the agent. Whereas the domain-central ambient temperature terms (§4.2.1) can all take the non-referential *ír-u* (mNOM) 'land' as subject (28), **ír-u buss-áyyoo'u* {land-mNOM burn.CAUS1-3mPROG}, with the intended meaning 'it is very hot', is unacceptable. In contrast, the verb *faar-* 'boil (itr.)' and the noun *faar-á* 'boiling, extremely hot thing' are attested with a non-referential subject *ír-u* (mNOM) 'land' (34).

- (34) Kabár ír-u **fáarr-ee'u** ~ **fáar-a-a**
today.mOBL land-mNOM boil-3mPRF boiling_thing-mPRED-mCOP2
'Today it is extremely hot.' (First variant volunteered by native speaker consultant in
2002)

4.2.2.2 Comfortably cold or warm. As in the tactile frame of evaluation (§4.1.2.2), *sigg-* 'comfortably cold or warm, cool' can be used for a pleasant, not too hot (or no longer too hot) ambient temperature (35)-(36). In (35), the temperature term is used as the predicate, and in (36) as a case and gender-agreeing modifier.

- (35) Kabár ír-u-s **sígg-a-a,** ber-é
today.mOBL land-mNOM-DEF cool-mPRED-mCOP2 yesterday-mACC
abb-íshsh iib-áyyoo-haa íkke
be(come)_much-CAUS1.3mPCO be(come)_warm/hot-3mPROG.REL-mCOP2 PST
'Today the weather is pleasant(ly warm), (while) yesterday it was very hot.'
- (36) Lal-í az-úta afuushsh-eennó=b-u
cows-mGEN milk-fACC put-3honIPV.REL=PLC-mNOM
sígg-á=bb-a ikk-ó=da xúm-a-a
cool-mACC=PLC-mACC become-3mPFV.REL=COND good-mPRED-mCOP2
'It is good if the place where the cow milk is stored is a cool place.' (Kambaatissata 1989:
4.25)

4.2.2.3 Extremely cold. For the expression of extremely cold ambient temperatures, Kambaata does not seem to make use of the tactile lexeme *QABAD-* (§4.1.2.4);¹³ the utterance **ír-u qabájj-ee ’u* {land-mNOM be_extremely_cold-3mPRF} with the intended meaning ‘it is extremely cold’ is unacceptable. Instead extreme cold can be expressed with the help of the noun *quxal-íta* (f) ‘bitter, freezing ambient cold, frost’ (37) or the corresponding verb *quxal-* ‘be(come) bitterly, freezing ambient cold, frosty’, e.g. *ír-u quxállee ’u* ‘it (lit. the land) is bitterly ambient cold’.

- (37) Ir-áan híil-at **quxál-it** úbb-ee’u
 land-mLOC bad-fNOM bitter_cold-fNOM fall-3mPRF
 ka sann-á
 A_DEM1.mACC season-mACC
 ‘This season is bitterly cold (lit. bad bitter cold has fallen on the land this season).’

Alternatively, extreme cold weather is described as being nose-cutting (38).

- (38) Ku ír-u **san-úta** **mur-áyoo’u**
 A_DEM1.mNOM land-mNOM nose-fACC cut-3mPROG
 ‘It is bitterly cold (lit. This land is cutting the nose).’ (Volunteered by a native speaker in 2007)

Weather terms may conflate temperature and humidity, e.g. *ciimool-* ‘be(come) (ambient) cold and rainy (and muddy)’.

4.3. Personal-feeling temperature. Under personal-feeling temperature we subsume expressions of thermal comfort, e.g. ‘I’m feeling hot’, ‘I’m freezing’ (§4.3.1), and expressions evaluating the temperature of one’s own body parts, e.g. ‘my nose is cold’, ‘my feet are warm’ (§4.3.2). In expressions of personal-feeling temperature, the persons (or animate beings) experiencing a particular sensation are encoded overtly. As indicated in Table 9, the experiencer occurs either as the direct object (DO) of a temperature verb or as the possessor (POSS) of a subject that refers to a particular body part. Expressions of thermal comfort (Personal-feeling type I) are modeled on – but are not identical to – ambient temperature expressions, lit. ‘it colds me’, whereas body part temperature (Personal-feeling type II) is expressed by the tactile temperature construction, lit. ‘my feet are cold’.

Personal-feeling type I/II is an alternative way of expressing thermal comfort (§4.3.3). As the label reflects, it combines features of the personal-feeling construction types I and II. On the one hand, like type I, it takes the lexeme *gid-* ‘non-tactile cold’ (and not *caal-* ‘tactile cold’) as the predicate; on the other hand, like type II, ‘body’ serves as the subject and the experiencer is expressed as the possessor of the subject.

¹³ Note, however, that Alemu (2016: 788) lists the idiom *qabad-á max-óo* {extremely_cold-mACC rainy_season-mACC}, which is unknown to the second author. Alemu defines the entry as *abbíshsh gidanó sammá* ‘season which is very non-tactile cold’ (English translation and stress marking ours).

Table 9. Comparison of personal-feeling temperature constructions (∅ = empty non-referential subject)

Frame of evaluation	Subject	Predicate	Lexical opposition ‘cold’ vs. ‘warm/hot’	Examples
Ambient temperature (§4.2)	∅ ~ place/time	temperature V/Adj	<i>GID</i> vs. <i>IIB-</i>	(28)-(32)
Personal-feeling temperature – Type I: Thermal comfort (§4.3.1)	∅ ~ clothing	temperature V- DO _{experiencer}	<i>gid-</i> vs. <i>iibb-is-</i>	(39)-(44)
Personal-feeling temperature – Type I/II: Thermal comfort (§4.3.3)	body- POSS _{experiencer}	temperature V	<i>gid-</i> vs. <i>iib-</i>	(47)-(48)
Personal-feeling temperature – Type II: Body parts (§4.3.2)	body part- POSS _{experiencer}	temperature V/Adj	<i>CAAL-</i> vs. <i>IIB-</i>	(45)-(46)
Tactile temperature: Things (§4.1)	thing	temperature V/Adj	<i>CAAL-</i> vs. <i>IIB-</i>	(12)-(13)

The constructional variation found in the domain of personal-feeling temperature may be conceptually and perceptually motivated. Personal-feeling temperature can either be conceptualized as an inner bodily experience or as an external tactile experience made via one’s skin. Whereas construction type I is restricted to the expression of one’s own inner temperature, constructions I/II and II can be used either for the inner evaluation of one’s own body (part) temperature or for the tactile evaluation of somebody’s body (part) temperature by another individual.

4.3.1. Personal-feeling temperature type I: Thermal comfort

Table 10. Personal-feeling temperature – construction type I

SBJ _∅ / SBJ _{clothing}	Predicate	
	‘non-tactile cold’ <i>gid-</i> [V] + DO _{experiencer}	‘warm/hot’ <i>iibb-is-</i> [V-CAUS1] + DO _{experiencer}

For the expression of thermal comfort (Table 10) Kambaata makes use of the same lexical material as in the expression of ambient temperature (§4.2). However, we observe morphological and syntactic differences between the two frames of evaluation. For the expression of ambient temperature, the temperature lexemes can be used in their adjectival or in their verbal forms – recall (27) and (28). For the expression of thermal comfort, only verbs are permitted. In the hot domain, the experiencer is expressed as the direct object of the causativized temperature verb, *iibb-is-* ‘warm/heat (something)’,¹⁴ either by a pronominal suffix on the verb, see -’e 1sO in (40), or by both a pronominal suffix and an accusative (pro)noun phrase, see *ées* and -’e in (39). The hypothetical

¹⁴ The verb *iibb-is-* ‘warm/heat (tr.)’ is the simple causative of *iib-* ‘be(come) warm/hot’ (§§4.1.1, 4.2.1).

form **iib-áyyoomm* {be(come)_warm/hot-1sPROG} with the intended meaning ‘I feel hot’ is ungrammatical.¹⁵

(39) *Ées kabár iibb-is-áyyoo-’e*
 1sACC today.mOBL be(come)_warm/hot-CAUS1-3mPROG-1sO
 ‘I feel hot today (lit. (it) is heating me today).’

(40) *Dagujj-oommí án dagud-án wáall-eemmi=tannée*
 run-1sPFV.REL 1sNOM run-1sICO come-1sPRF.REL=REAS1
m-í qax-á-ndo iibb-íshsh-o-’e
 what-mGEN extent-mACC-Q be(come)_warm/hot-CAUS1-3mPFV-1sO
 (Context: A asks B why he is sweating so much. B replies:) ‘I have come running (nonstop), that’s why I feel very hot (lit. because a running me came running, to what extent did (it) heat me).’

The subject slot remains empty when atmospheric conditions or physical exercises are the reasons for the experiencer’s high body temperature (39)-(40). The subject slot can, however, be filled if clothing keeps the experiencer warm (41).

(41) *Ku jaakkéett-u iibb-is-áyyoo-’e,*
 A_DEM1.mNOM jacket-mNOM be(come)_warm/hot-CAUS1-3mPROG-1sO
fushsh-áamm
 take_off-1sIPV
 ‘This jacket is (too) warm (lit. it warms/heats me), I will take it off.’

In the cold domain, the experiencer of personal-feeling temperature is expressed as the direct object of the underived temperature verb *gid-* ‘be(come) non-tactile cold’, again, only encoded either by an object suffix on the verb (42) or by an object suffix and a full object (pro)noun phrase simultaneously (43). It is noteworthy that the verb *gid-* is here not extended by a causative morpheme;¹⁶ *gid-* thus represents the only true labile (intransitive-transitive) verb that we have come across in the language. In (42)-(43), *gid-* is used as the main verb, in (44) as a subordinate verb, more precisely as a different subject converb.

¹⁵ The underived verb root *iib-* cannot be used to express personal-feeling temperature. A verb form such as *iib-áyyoo-’e* {be(come)_warm/hot-3mPROG-1sO} can only be interpreted as expressing tactile temperature, with the object pronoun referring to a dative beneficiary, i.e. ‘(something masculine) is becoming warm/hot for my benefit’.

¹⁶ The causative verb *gid-is-* lit. ‘make non-tactile cold’ is never used in temperature expressions. The verb does exist though; it is found in blessings to the family of a deceased (§5.2.4).

- (42) *Áaz-u-’i* *fayy-á* *ih-ú*
interior-mNOM-1sPOSS healthy-fACC become-mACC
hoogg-ó=tannée
not_do-3mPFV.REL=REAS1
kánn *arriichch-ooní-i* ***gid-áyyoo-’e***
A_DEM1.mOBL sun.SG-fLOC-ADD be(come)_non_tactile_cold-3mPROG-1sO
‘As I am not feeling well (lit. my interior is not healthy), I even feel cold in the sun (lit. it even “colds” me in the sun).’
- (43) *Má’nn-inti-s* *abb-ís-s*
place-fNOM<N>-DEF be(come)_much-CAUS1-3fPCO
gid-dáa-taa,
be(come)_non_tactile_cold-3fIPV.REL-fCOP2
eesí-i ***gíjj-o-’e***
1sACC-ADD be(come)_non_tactile_cold-3mPFV-1sO
‘The place is very cold, and I am cold (lit. (it)¹⁷ “colded” me), too.’
- (44) *Mán-ch-u* *gid-áan* *uurr-í-yan*
people-SG-mNOM non_tactile_cold-mLOC stand-3mPCO-DS
gíjj-i-yan-s *hux-áyyoo’u*
be(come)_non_tactile_cold-3mPCO-DS-3mO shiver-3mPROG
(Description of a picture in a schoolbook) ‘A man is standing in the cold, he is freezing (lit. (it) has “colded” him), and he is shivering.’ (Sayinsa 1995: 1.5)

4.3.2. Personal-feeling temperature type II: Body parts

Table 11. Personal-feeling temperature – construction type II

SBJ _{body part} -POSS _{experiencer}	Predicate	
	‘tactile cold’ <i>caal-á(ta)</i> [ADJ] ~ <i>caal-</i> [V]	‘warm/hot’ <i>iib-á(ta)</i> [ADJ] ~ <i>iib-</i> [V]

For the expression of the temperature of one’s own body parts, Kambaata uses a construction (Table 11) that is formally identical to the tactile temperature construction (see §4.1). This formal resemblance has consequences for the lexeme choice in the cold domain: *CAAL-* ‘tactile cold’, rather than *GID-* ‘non-tactile cold’, is used to qualify cold body parts (45)-(46). The body part occurs as the subject of a temperature predicate (adjective or verb), and the experiencer is encoded as the possessor of the subject.

- (45) *Lókk-a-’i* ***cáal-tee’u*** (**gíd-dee’u*)
foot-fNOM-1sPOSS be(come)_tactile_cold-3fPRF
‘I have cold feet (lit. my feet are cold).’

¹⁷ The feminine noun *má’nn-inti-s* ‘the place’ is not the subject of the final masculine temperature verb.

- (46) Xon-éechchi-n áff hikkánn kin-óon
 before-mABL-N take.1sPCO A_DEM2.mOBL stone-mLOC
 afuu'll-í-yan fagáar-u-'i **caall-ee'u**
 sit-1sPCO-DS bottom-mNOM-1sPOSS be(come)_tactile_cold-3mPRF
 'I have been sitting on this stone for a while and now I have a cold bottom (lit. my bottom is cold).'

In case of extreme coldness, body parts can also be characterized with *badar-* 'be(come) numb (of cold) (e.g. because of cold weather or because of having touched something cold)'.

4.3.3. Personal-feeling temperature type I/II: Thermal comfort

Table 12. Personal-feeling temperature – construction type I/II

SBJ _{body} -POSS _{experiencer}	Predicate ¹⁸	
	'non-tactile cold' <i>gid-</i> [v]	'warm/hot' <i>iib-</i> [v]

The construction for body part temperature described in §4.3.2 can also be applied to express thermal comfort (Table 12), in which case the body as a whole occurs as the subject (47), again with the experiencer as the possessor.

- (47) (...) ál-u-se **iibb-ó** saat-ahá-a
 body-mNOM-3fPOSS be(come)_warm/hot-3mPFV.REL time-mACC-ADD
 tees-ó hamiil-agud-á agud-dáa'u
 now-fGEN cabbage-SIM-mACC resemble-3fIPV
 (Speaking about a grammatically feminine chameleon) '(...) and when its (lit. her) body is warm (i.e. it feels warm), it (lit. she) looks cabbage-colored.' (TD2016-02-11_001)

However, unlike the expression of body part temperature (45)-(46), speakers use *GID-* 'non-tactile cold' rather than *CAAL-* 'tactile cold' if 'body' is the subject in contexts such as (48). Thus the personal-feeling construction type I/II shares syntactic features with the body part temperature construction (= personal-feeling construction type II) but lexical features with personal-feeling construction type I (recall Table 9).

- (48) ál-u-se **gijj-ó** (?caall-ó)
 body-mNOM-3fPOSS be(come)_non_tactile_cold-3mPFV.REL
 saat-ahá-a
 time-mACC-ADD
 (Example elicited on the basis of (47)) '(...) and when her body is cold (i.e. she feels cold)'

When speaking about fever, a structurally parallel temperature expression with 'body' as the subject can be used (49).

¹⁸ So far, only examples in which 'body' occurs with a verbal temperature predicate are attested in our corpus.

- (49) Ka ciil-í ál-u **iib-áyyoo'u** /
 A_DEM1.mOBL child-mGEN body-mNOM be(come)_warm/hot-3mPROG
buss-áyyoo'u / **faar-áyyoo'u**
 burn-3mPROG boil-3mPROG
 'This child has a fever/has high fever (lit. this child's body is burning) / has an extremely high fever (lit. this child's body is boiling).'

4.3.4. Extreme personal-feeling temperature. Apart from the construction types that were discussed in §§4.3.1-3 and schematized in Table 9, two little attested alternative constructions occur in our database. Both constructions express extreme body temperature. Firstly, temperatures themselves can be said to be on/in or act on the experiencer; temperature nouns (§3.2) thus serve as the subject of the clause. In (50), cold is said to kill the experiencer. When speaking about fever, heat can be said to be (or not be) in/on the body of the patient (51) (compare with the alternative fever expression in (49)).

- (50) **Gíd-u** sh-áayyoo-kkee-'nnu? Giir-á=b-a
 non-tactile_cold-mNOM kill-3mPROG-2sO.VV-PRAG3 fire-fGEN=PLC-mACC
 hínc=y-ít guba'-ánti-ba-ndo?
 close.IDEO=say-2fPCO warm_oneself_up-2sIPV-NEG1-Q
 'You are freezing terribly (lit. non-tactile cold is killing you), aren't you? Don't you (want to) move closer to the fire to warm yourself up?'
- (51) Al-éen-ta-s híil-u **iib-u** yóo-ba'a
 body-mLOC-L-3mPOSS bad-mNOM warmth/heat-mNOM COP1-NEG1
 'He has no fever (lit. on/in his body there is no bad/dangerous heat).'

Secondly, extreme bodily cold can be expressed by equating the experiencer with a cold thing that is subject to tactile evaluation, i.e. whose body is so cold that this should be evident by touching them, or whose body is as cold as a corpse. Consequently, the construction for tactile temperature (§4.1) is applied, the experiencer becomes the subject of the clause, and the lexeme *CAAL-* 'tactile cold' (and not *GID-* 'ambient, personal-feeling cold') is used as the predicate. By the use of a lexeme and a construction type that is usually not associated with personal-feeling temperature, hyperbole is expressed (52).

- (52) Ka jaakkeet-á odd-aqq-eemmíich
 A_DEM1.mACC jacket-mACC wear-MID-1sPFV.ABL
 téma ál-u-'i iib-áyyoo'u.
 now body-mNOM-1sPOSS be(come)_warm/hot-3mPROG
 Wóna-'nnu **cáall-eemmi-a** **íkke**
 first.OBL-PRAG3 be(come)_tactile_cold-1sPRF.REL-mCOP2 PST
 'Now that I have put on this jacket, my body is warming up. I was feeling terribly, deadly cold before.'

If (52) were a neutral (non-hyperbolic) expression of bodily cold, the predicate would have been *gíjj-ee-'e-a íkke* {be(come)_non_tactile_cold-3mPRF-1sO.REL-mCOP2 PST}, lit. 'it "colder" me' (§4.3.1).

4.4. Interim summary. Kambaata temperature constructions fall into different types according to Pustet's (2015) morphosyntactic typology of temperature predications. The tactile temperature construction (§4.1) is a simple intransitive construction, in which the entity whose temperature is evaluated, the stimulus, occurs as the subject of an adjectival or verbal predicate; the predicate reflects the person and gender of the stimulus; recall (12).

For the expression of ambient temperature (§4.2), Kambaata also applies an intransitive strategy (Pustet 2015: 904ff), which comes, however, in three sub-types: In the first sub-type, the subject slot is empty and the temperature predicate carries a default third person masculine subject index (27); in the second sub-type, the subject slot is filled by the non-referential noun *ir-á* (m) 'land' (28), which also triggers a third person masculine index on the predicate. In the third sub-type, the subject is a referential noun of place or time, with which the predicate agrees in person and gender; refer to (29) and (43), which contain a masculine and a feminine place noun, respectively.

The situation is most complex in the frame of personal-feeling temperature. Here we can distinguish four construction types, arranged roughly from most to least frequent:

(A) In a pseudo-transitive construction, the experiencer of temperature of his/her own body is expressed as the accusative object of a causative or labile temperature verb. The subject slot remains empty. The temperature verb is by default indexed for a third person masculine subject, which lacks, however, an extra-linguistic referent. The construction translates literally as '(it) "colds" or warms/heats the experiencer', as in (39), (40), (42)-(44), and corresponds to Pustet's Non-referential Subject Strategy (2015: 893-896). The pseudo-transitive construction of personal-feeling temperature is a coding format that is uncommon elsewhere in the language.

(B) Personal-feeling construction types I/II and II are intransitive (§§4.3.2-3); here a body part or the whole body is the overt subject of a temperature verb, while the experiencer is encoded as the possessor of this subject. It translates literally as 'experiencer's body (part) is cold or warm/hot' (45)-(48). This does not correspond to any separate type in Pustet (2015).

(C) In the second type of intransitive construction, which is marginally used for extreme personal-feeling temperature cold (§4.3.4), the experiencer is expressed as the subject of a temperature verb, i.e. 'experiencer "colds"' (52) (Pustet 2015: Experiencer as Intransitive Subject Strategy).

(D) Kambaata occasionally resorts to a truly transitive construction for the expression of extreme personal-feeling cold. Here a temperature noun functions as subject and the experiencer as accusative object, i.e. 'non-tactile cold kills the experiencer' (50) (Pustet 2015: Experiencer as Transitive Object Strategy).

5. Semantic extensions of temperature terms

Many temperature terms are not exclusively used to express temperature; their meaning has been extended to other semantic domains. From cross-linguistic studies (e.g. Koptjevskaja-Tamm 2015b: 31ff) we know that temperature terms are frequently used to characterize other sensations (taste, vision) as well as emotions and intellectual capabilities. In the cognitive literature, temperature-related (near) universal conceptual metaphors such as AFFECTION (or: CARING) IS WARMTH, INTENSITY OF ACTIVITY IS HEAT, and ANGER (or: LACK OF CONTROL) IS HEAT or, more generally, INTENSITY OF EMOTION IS HEAT have been proposed; see, among others, Grady (1997: 290, 293, 295), Lakoff & Johnson (1999: 50), Kövecses (1995), and Vejdemo & Vandewinkel (2016). As

pointed out by Koptjevskaja-Tamm (2015b: 3), the empirical, cross-linguistic basis for the universality of these metaphors is still limited and the semantic extensions of temperature terms beyond Indo-European are still little studied. Therefore, this section attempts to give as exhaustive an account as possible of the extended uses of temperature terms in Kambaata.

5.1. Semantic extensions of WARM/HOT and BURNING HOT. The temperature terms *iib-* ‘warm/hot’ and *buss-* ‘burn (tr.); be dangerously, excessively hot’ are metaphorically and metonymically extended as follows:

- FRESHNESS IS WARMTH/HEAT
- INTENSE ACTIVITY IS WARMTH/HEAT
- ANGER IS BURNING HEAT
- SPICINESS IS BURNING HEAT
- RAGING THIRST IS BURNING HEAT

5.1.1. FRESHNESS IS WARMTH/HEAT. The term *iib-* ‘warm/hot’ is used to qualify certain food types as ‘fresh, recently produced’. Kambaata differentiates three types of milk: *iib-áta* (f) ‘unprocessed, fresh milk’, *gimm-áta* (f) ‘churned milk’ and *ge'in-ú* (m) ‘soured milk, yoghurt’. Irrespective of its objective temperature, unprocessed and unfermented fresh milk is called *iib-áta* ‘warm/hot (one)’ (53). The term *iib-* ‘warm/hot’ can also be applied to bread even if it has been out of the oven for a while and is no longer warm as regards its temperature (54).

(53) Xaaq-úmb-u **iib-áta** qulx-áno-ba'a
 breed-3mNEG5-mNOM warm/hot-fACC desire-3mIPV-NEG1
 (Proverb) ‘Someone who doesn’t breed (cattle) (should not) desire fresh milk.’
 (Geetaahun 2002: 114)

(54) A: Dáabb-ut eger-táa-taa-ndo?
 bread-fNOM stay-3fIPV.REL-fCOP2-Q
 ‘Has the bread been lying around for a while?’
 B: **Íib-a-ta**
 warm/hot-fPRED-fCOP2
 ‘(No,) it’s fresh.’

All food types that are qualified as fresh by *iib-á(ta)* were warm when they came into existence. The term *iib-* is not applied, for instance, to qualify the freshness of fruits. The motivation for the extension of *iib-* is thus still transparent.

5.1.2. INTENSE ACTIVITY IS WARMTH/HEAT. Busyness, bustling activity and vivacity is associated with warmth/heat. One can commonly overhear speakers qualify a bustling market as warm/hot (55) (compare with (66)). Similarly, electrifying music that carries people away (56) and captivating, trending news (57) (cf. English *hot topic*) are ‘warm/hot’.

- (55) A: Kabaráé antabee'-í díkk-ut **íib-bee'u**
 today-mGEN chicken-mGEN market-fNOM be(come)_warm/hot-3fPRF
 'Today's chicken market is bustling/crowded (lit. warm/hot).'
- B: Áchche ayyáan-u ga'-áa hamús-i-a
 DM holiday-mNOM tomorrow-fGEN Thursday-mGEN-mCOP2
 bār-i-bala!
 day-mPRED-PRAG2
 'The holiday is next Thursday (as you are supposed to know)!'

 (56) Shál-at **íib-bóo=da** dín-u korj-áno
 music-fNOM warm/hot-3fPFV.REL=COND lame-mNOM jump-3mIPV
 (Proverb) 'When the music is electrifying (lit. has become warm/hot), (even) a lame
 (person) dances (lit. jumps).' (Alamu & Alamaayyo 2017: 143)

 (57) Híkku haasáaww-u ka sann-á
 A_DEM2.mNOM talk-mNOM A_DEM1.mACC week-mACC
íibb-ee'u
 be(come)_warm/hot-3mPRF
 'That news has been trending (lit. has become warm/hot) this week.'

Bustling activity expressed as warmth/heat can be considered positive or negative. However, in the collocation 'warm/hot talk', the temperature term has a negative connotation. In contrast to *warm words* in English, Kambaata *iib-* 'warm/hot' is not linked to affection but rather means 'animated but without consequences, meaningless, void' (58). Consequently, people who overstate and exaggerate are advised as in (59).

- (58) Ís **íibb-íshsh** haasáaww-u-a
 3mNOM be(come)_warm/hot-CAUS1.3mPCO talk-mPRED-mCOP2
 bagáan huj-é al-éen yóo-ba'i-a
 CNTR work-fGEN top-mLOC COP1.3-NEG1.REL-mCOP2
 'He is (only good at) animated talk but he doesn't work (lit. He warms/heats up (and)
 talks but he is not on top of work).'
- (59) Kám **íibb-ís-soot-i**
 INTJ be(come)_warm-CAUS1-2sNEG2-IMP
 'Hang on, don't get carried away (lit. don't warm/heat (it) up)!'

Grady (1997: 290) proposes INTENSITY OF ACTIVITY IS HEAT as a primary metaphor.

5.1.3. ANGER IS BURNING HEAT. Burning heat is often linked to anger, and the Kambaata data is no exception to the cross-culturally widespread conceptual metaphor ANGER IS HEAT (see e.g. Kövecses 1995, 2000, or INTENSITY OF EMOTION IS HEAT in Grady 1997). Words or actions that arouse someone's anger are said to burn him/her, which is conveyed by the causative of *bub-* 'burn (itr.)' > CAUS1 *buss-* 'burn (tr.)'; the experiencer is expressed as the direct object (60).

- (60) Ís esáan ber-é daqq-ámm-i=ké'
 3mNOM 1sICP yesterday-mACC find.MID-PASS-3mPCO=SEQ
buss-ée-’e qáx-u!
 burn-3mPRF-1sO.REL extent-mNOM
 (Exclamation) ‘He made me (incredibly) angry when we met yesterday (lit. the extent to which it burnt me when he met with me yesterday)!’

The noun *bub-áta* (f) ‘blaze’, which contains the same root as the verb *buss-* (*bub-s-) ‘burn (tr.); be dangerously, excessively hot’, has the extended meaning ‘rage, anger’ (Alemu 2016: 157). Revenge for an act that enraged a person is expressed with the idiom ‘exit, go out to one’s rage’ (61).¹⁹

- (61) Ber-é boroor-too-’é qood-á
 yesterday-mACC insult-3fPFV-1sO.REL share-mACC
 kabár márr-i=ké’ **bub-á-’i** full-óomm
 today.mOBL go-1sPCO=SEQ anger-fACC-1sPOSS come_out-1sPFV
 ‘Today I went and made her pay / took revenge (lit. I came out/exited to my anger) for her insults of yesterday.’

A short-tempered person who gets angry quickly is said to be ‘nose-warm/hot’ (62).²⁰

- (62) Ís san-úta **ûb-a-a**
 3mNOM nose-fACC warm/hot-mPRED-mCOP2
 ‘He is short-tempered (lit. nose-warm/hot, warm/hot with respect to the nose).’

5.1.4. SPICINESS IS BURNING HEAT. Like many languages of the world (see e.g. Perrin 2016: 175 on Wolof), Kambaata describes the sensation triggered by chili pepper as burning heat (63).

- (63) Ku babbár-u **buss-áno-a**
 A_DEM1.mNOM chili_pepper-mNOM burn.CAUS1-3mIPV.REL-mCOP2
 ‘This chili pepper is hot (lit. is one that makes burn).’

5.1.5. RAGING THIRST IS BURNING HEAT. Kambaata also conceptualizes raging thirst as burning heat (64) (cf. (79)).

- (64) Háy **búbb-eemm**, wo’-á áass-e-’e
 please burn-1sPRF water-mACC give-2sIMP-1sO
 ‘Please, I am parched (lit. I’m burning), give me (some) water!’

5.2. Semantic extensions of COLD and COOL. The semantic extensions of the lexemes *CAAL-* ‘tactile cold’, *GID-* ‘non-tactile cold’, *SIGG-* ‘comfortably cold or warm, cool’ and *QABAD-* ‘extremely tactile cold’ are treated together in this section. We observe a certain overlap between the semantic

¹⁹ Another example is attested in Kambaatissata (1989: 4.78).

²⁰ This idiomatic expression is also attested in two proverbs from local Kambaata publications, see Geetaahun (2002: 102) and Alamu & Alamaayyo (2017: 141).

extensions of ‘comfortably cold or warm, cool’ and ‘non-tactile cold’, but notably not between ‘tactile cold’ and ‘non-tactile cold’. The following conceptual metaphors are treated in turn in this section.

- INACTIVITY IS TACTILE COLD
- INEPTNESS IS TACTILE COLD
- FEAR IS TACTILE COLD
- ABSENCE OF PAIN IS NON-TACTILE COLD OR COOLNESS
- CALMNESS IS COOLNESS OR NON-TACTILE COLD
- ABSENCE OF THIRST IS COOLNESS

5.2.1. INACTIVITY IS TACTILE COLD. Whereas intense activity and busyness are conceptualized as warmth/heat (§5.1.2), a sleepy, secluded place where not much is happening (65) or a little frequented, unusually quiet market in which prices have fallen due to low consumer demand (66), are qualified as ‘tactile cold’.²¹

(65) Hangácc-u **cáal-a-a**
 PN-mNOM tactile_cold-mPRED-mCOP2
 ‘Hangacca (= town in northern Kambaata) is (a) sleepy (place) (lit. cold).’

(66) Ír-u xoom-á íkk-i-yan
 land-mNOM fasting_period-mACC become-3mPCO-DS
 buur-í díkk-ut **cáal-tee’u** kabár!
 butter-mGEN market-fNOM be(come)_tactile_cold-3fPRF today.mOBL
 ‘It’s the fasting period,²² (and) not much is happening on the butter market (lit. the butter market is cold) today (i.e. there are no customers and the prices have fallen).’

A comparison of (65) and (2) reveals an important semantic difference: If a place is qualified as *GID*- ‘non-tactile cold’ its atmospheric temperature is low (compared to an implicit standard). However, if a place is said to be *CAAL*- ‘tactile cold’ then only a figurative interpretation, ‘sleepy, secluded’, is possible. Example (66) is antonymous to (55), where a warm/hot market is a busy market.

5.2.2. INEPTNESS IS TACTILE COLD. A person who is not communicative and socially inept is qualified as ‘tactile cold’ (67).

(67) Kám, ís **cáal-a-a**
 INTJ 3mNOM tactile_cold-mPRED-mCOP2
 ‘Gee, he is not communicative / socially inept (lit. cold).’

A related metaphor is found in Alemu (2016):²³ The term *qabad-á(ta)* ‘extremely tactile cold’ is semantically extended to qualify a person as dull and dimwitted, cf. the dictionary definition in (68).

²¹ Alternatively, an unusually quiet, little frequented market can be qualified as *GIC*- ‘(of fire, utensils on fire) not burning properly, not hot (enough), not (too) hot’ (§4.1.2.3).

²² In the fasting period of the Ethiopian Orthodox Church no meat and milk products are consumed.

²³ This semantic extension is not recognized by the second author.

- (68) Qabad-á: zah[h]-icc-i-sí²⁴ fayyím-at
 extremely_cold-mACC go_around-CAUS1.MID-mGEN-3mPOSS health-fNOM
 nann-is-sáa qax-á qall-ú manch-ú
 doubt-CAUS1-3fIPV.REL extent-mACC stupid-mACC person-SG-mACC
 ‘*Qabada*: a stupid person who makes (you) doubt their capacity to think’ (Alemu 2016: 788; translation, segmentation, glosses and stress marks ours)

Similar extensions of ‘cold’ have been reported for the Kwa languages Ewe and Selee (Ameke 2015: 61; Agbetsoamedo & Di Garbo 2015: 121f).

5.2.3. FEAR IS TACTILE COLD. A person who gets a fright is conceptualized as becoming cold. Consequently, Kambaata could be assumed to illustrate the cross-culturally common conceptual metaphor FEAR IS A DROP IN BODY TEMPERATURE (Shindo 1998: 36; see also Kryvenko 2015: 325 for Ukrainian). Interestingly, however, Kambaata does not use *GID*- ‘non-tactile (ambient, bodily) cold’ but *CAAL*- ‘tactile cold’ for the expression of fear.

- (69) Got-iichch-ú ír-a xúujj-i=ké’
 hyena-SG-mACC land-mOBL see-1sPCO=SEQ
cáall-eemmi mán-ch-u dagud-án wáall
 be(come)_tactile_cold-1sPRF.REL people-SG-mNOM run-1sICO come.1sPCO
 min-í aagg-óomm
 house-mACC enter-1sPFV
 ‘When I saw a hyena on (our) farm, I got a fright and ran home (lit. I, a/the man who has become cold, ran, came, entered the house).’

5.2.4. ABSENCE OF PAIN IS NON-TACTILE COLD or COOLNESS. The absence of emotional and physical pain is linked to non-tactile cold and coolness. Thus the lexemes *GID*- ‘non-tactile cold’ and *SIGG*- ‘comfortably cold or warm, cool’ are used with the extended meaning ‘consoled (after the death of a loved one); healed, without pain (after an injury)’ in blessings. A conventionalized blessing for the relatives of a recently deceased person and the conventionalized answer are given in (70).

- (70) A: Gid-is-seentá=r-u
 be(come)_non_tactile_cold-CAUS1-2pPFV.REL=NMZ4-mNOM
 gíd-u
 be(come)_non_tactile_cold-3mBDV
 (= visitor): ‘My sincere condolences (lit. May what you allowed to become non-tactile cold, be/remain non-tactile cold)!’
 B: Gíjj-ee’u
 be(come)_non_tactile_cold-3mPRF
 (= bereaved): ‘We are consoled (lit. (It) has become non-tactile cold).’

The metaphor ABSENCE OF PAIN IS TACTILE COLD or COOLNESS is equally reflected in the conventionalized circumcision blessing that is pronounced when the circumcised leaves the house

²⁴ The derived verb *zahn-icc*- ‘reflect, think, recognize’ is based on the motion verb *zahn*- ‘go around’.

for the first time after the surgery (71). In interviews about the old circumcision traditions, some speakers use *sigg-á*, while others employ *gid-á* with the meaning ‘healed’ – they can thus be considered synonymous in the context of blessings. In (72), we see *gid-á* ‘non-tactile cold’ being used in congratulations extended to a circumcised boy.

(71) **Sigg-á** [~ **gid-á**] háan-t fúl-i
 cool-mACC non_tactile_cold-mACC step-2sPCO go_out-2sIMP
 (Blessing) ‘Step out healed (lit. cool ~ non-tactile cold)!’

(72) **Gid-á** íkk-o-kke
 non_tactile_cold-mACC become-3mPFV-2sO
 (Congratulations) ‘You are healed (lit. (It) has become non-tactile cold for you).’ (AN2016-02-19)

If somebody encounters something negative and is shocked to learn about somebody’s illness, accident or dispute, a common reaction is the utterance in (73).

(73) **Gid-á** íh-u, ís!
 non_tactile_cold-mACC become-3mBEN 3mNOM
 ‘Heaven forbid (lit. May it be(come) non-tactile cold)!’

Absence of pain is also connected to cold in the Gur language Gureñ (Atintono 2015: 99), just as having a cold of heart expresses a feeling of comfort in the Kwa language Ewe (Ameka 2015: 59f).

5.2.5. CALMNESS IS COOLNESS or NON-TACTILE COLD. Whereas a ‘tactile cold’ person is socially inept and an ‘extremely tactile cold’ person stupid (§5.2.2), the application of *SIGG-* ‘comfortably cold or warm, cool’ to a person is unequivocally positive and characterizes him/her as calm and composed (74). This semantic extension is attested in various languages around the world.

(74) Ís **sígg-a-a** adab-áa
 3mNOM cool-mOBL-mCOP2 boy-mPRED
 ‘He is a calm (lit. cool) boy (e.g. he thinks before he talks).’

A problematic issue that has been settled (75) and anger that has been calmed (76) are said to have cooled down. The proverb in (75) plays with the basic and metaphorical meanings of *sigg-* 1. ‘be(come) cool’, 2. ‘be settled’.

(75) Xáh-uhu-u xorósh-uhu-u
 issue-mNOM-ADD maize_bread-mNOM-ADD
sígg-ée=da xe’-áno
 be(come)_cool-3mPFV=COND taste_good-3mIPV
 (Proverb) ‘Issues and maize bread taste good when they’re cool.’ (Alamu & Alamaayyo 2017: 163)

- (76) Harraashsh-i amúrr-it waal-tóo bar-í
 timid-mGEN anger-fNOM come-3fPFV.REL day-mACC
 sarb-ít **sigg-itáa-ba'a**
 do_quickly-3fPCO be(come)_cool-3fIPV-NEG1
 'The anger of a timid (person) does not subside (lit. cool down) easily once it has come
 (to the surface).' (Alamu & Alamaayyo 2017: 73)

Calming down can also be expressed with the causative verb *gid-is-*, lit. 'make non-tactile cold', as seen in the following proverb.²⁵

- (77) Máash-at arráb-it amurr-íta **gid-is-sáa'u**
 kind-fNOM tongue-fNOM anger-fACC be(come)_non_tactile_cold-CAUS1-3fIPV
 'A kind tongue (i.e. kind words) calms anger.' (Kambaatissata 1989: 4.45)

Quarrelling parties are blessed as in (78). The example is also interesting from a grammatical perspective, as it illustrates the use of a plurativized temperature adjective. As head of an NP and in reference to a plural number of people, the adjective receives here the morpheme *-aakk*.

- (78) **Gid-aakk-áta** ikk-é
 non_tactile_cold-PL2-fACC become-2pIMP
 (Blessing for quarrelling parties) 'May your problem be settled/your anger be calmed (lit. May you (p) become non-tactile cold ones)!'

5.2.6. ABSENCE OF THIRST IS COOLNESS. Excessive thirst is conceptualized as burning heat (64). Water quenches the experiencer's thirst and is literally said to 'cool the heart', as seen in the excerpt from a poem in (79). The same metaphor is also attested in non-poetic data.

- (79) Wozan-á **sigg-is-án** mannoom-áta
 heart-mACC be(come)_cool-CAUS1-3mICO body-fACC
 táshsh=a'-fiha /
 comfortable.IDEO=do-mDAT
 Wó'-u abb-íshsh tam-áno
 water-mNOM be(come)_much-CAUS1.3mPCO be_useful-3mIPV
 re'-is-éen it-fiha
 get_ready-CAUS1-3honICO eat-mDAT
 (Verse from a poem) 'To cool the heart and to make the body feel good / To cook and
 (then) eat, water is very useful.' (Kambaatissata 1989: 3.66)²⁶

5.3. Interim summary. This section has shown that Kambaata extends the use of terms from the domain of temperature sensation to those of other bodily sensations, emotions and character traits. Warmth/heat is connected to freshness, busyness (intense activity) and anger. Excessive heat maps onto anger, spiciness and raging thirst. Tactile cold is associated with inactivity, ineptness and fear,

²⁵ It seems that *gid-is-* is preferred to *sigg-is-* in northern parts of Kambaata. Cf. footnote 11.

²⁶ The main verb in this example is found sentence-medially, because the regular head-final constituent order can be changed in poems.

whereas non-tactile cold stands for the absence of emotional and physical pain (i.e. consolation and healing). The extensions of tactile cold are always negative while those of non-tactile cold only positive. Coolness stands especially for calmness and the absence of thirst – both the basic and the extended meanings of the temperature term are unequivocally positive. However, not all Kambaata temperature terms have metaphorical extensions; we are, for instance, unaware of any extended uses of *GUMMUUT*- ‘tactile lukewarm (of liquids)’ and *QUXAL*- ‘bitterly ambient cold’.

We observe certain symmetries in the semantic extensions of temperature terms. Just as intense activity is warmth/heat, its opposite, inactivity, is tactile cold; just as anger is burning heat, calmness is coolness; and just as raging thirst is burning heat, its opposite, absence of thirst, is coolness. However, such pairings cannot be found for all extensions, and an antonymic temperature schema is not always mapped onto an antonymic target domain. See, for instance, that an uncommunicative, socially inept person is tactile cold, but that a communicative and social person is not warm/hot. Instead, a warm/hot person is agitated.

Given that most (possibly all) semantic extensions presented for Kambaata above are also attested in other languages of the world and are thus by no means unique, it is especially important to underline that some otherwise cross-linguistically common extensions are absent in Kambaata. There is notably no evidence for the use of temperature terms in the domain of vision (e.g. *cold colors*), sex (e.g. *hot* for ‘sexually aroused’) and affection (e.g. *warm words*, *warm-hearted*). The latter observation is especially remarkable, as the metaphor AFFECTION IS WARMTH is often tacitly assumed to be universal.²⁷ Furthermore, despite our best efforts, we could find hardly any extended uses of body-related temperature expressions, which Vejdemo & Vandewinkel (2016) hypothesize to be common to all human languages. In our data, only ‘cool the heart’ for ‘quench one’s thirst’ and ‘be nose-warm’ for ‘be short-tempered’ are attested.

6. Temperature terms in Highland East Cushitic

Kambaata belongs to the Highland East Cushitic (HEC) group of Cushitic, which encompasses the following languages: Hadiyya-Libido (i.e. the Hadiyya subgroup), Kambaata-Alaaba-K’abeena (i.e. the Kambaata subgroup), Sidaama, Gedeo and Burji.

²⁷ However, Koptjevskaja-Tamm (2015b: 3, 32) already expresses her doubts that this is sufficiently backed up by empirical evidence.

Figure 2. Highland East Cushitic languages²⁸



This section investigates whether Kambaata and its closest relatives carve up the semantic field of temperature in a similar way and whether they share cognate temperature lexemes. We concentrate on domain-central temperature terms and on the tactile and ambient frame of evaluation, because the available sources, i.e. entries in word lists and dictionaries as well as examples in grammars and text collections, contain no information on personal-feeling temperature. In order to allow for an easier comparison of the cognates, only bare lexical **roots** without derivational and inflectional morphology are given in Table 13.

²⁸ Map designed by Monika Feinen, 2009, all boundaries are unofficial.

Table 13. Temperature lexemes compared across HEC

Languages	‘warm/ hot’	‘tactile cold’	‘non-tactile cold’	Sources
Libido	<i>eepp’-</i>	<i>sigg-</i>	(no data)	Crass (n.d.)
Hadiyya	<i>iibb-</i>	<i>sigg-</i>	<i>k’iid-</i>	Sim (1989), Hudson (1989), Tadesse (2015)
Kambaata	<i>iib-</i>	<i>caal- /c’aal-/</i>	<i>gid-</i>	(authors’ data)
Alaaba	<i>iib-</i>		<i>k’iiz-</i>	Schneider-Blum (2007, 2009)
K’abeena	<i>iibb-</i>		<i>k’iiz-</i>	Crass (2005)
Sidaama	<i>iibb-</i>		<i>k’iid-</i>	Gasparini (1983), Hudson (1989), Kawachi (2007)
Gedeo	<i>eebb-</i>	<i>k’iid-</i>	<i>boojj-</i>	Hudson (1989), Wedekind (1990), Gasparini (1994), Eyob (2016)
Burji	<i>d’ayb- oyd’-</i>	<i>kabb-</i>	<i>sirg-</i>	Sasse (1982), Hudson (1989), Roba & Wedekind (2008)

All languages except Burji share a cognate lexical root for ‘warm/hot’,²⁹ which consists of a long close or mid vowel followed by a mostly geminate bilabial plosive. The root-final bilabial is ejective in Libido and degeminated in Kambaata and Alaaba. Hudson (1989: 81) has already proposed **iibb-a* as the proto-HEC form for ‘warm/hot’. While Kambaata uses the bare root *iib-* either as a verb, adjective or noun (with different sets of inflection), some HEC languages use the root ‘warm/hot’ only verbally and derive adjectives and nouns; see Alaaba *iib-aab-ú* ‘warm/hot’ and *iib-an-áta* ‘warmth/heat’³⁰ (Schneider-Blum 2007: 427). In Hadiyya, the root *iibb-* is used as a verb, whereas the adjective is a derived form *iibb-aall-a* ‘warm/hot’ (Hudson 1989: 284, Tadesse 2015: 352). The same is true of Sidaama, where yet another derivational morpheme generates the temperature adjective from the root: *iibb-ad-o* ‘warm/hot’ (Gasparini 1983: 172).

As for the lexeme ‘warm/hot’, Burji is the odd one out in Table 13. The language uses the derived middle verb *d’ayb-ad’-* for ‘warm/hot’ (Sasse 1982: 62); Hudson (1989: 81) and Roba & Wedekind (2008) provide the alternative ‘warm/hot’ lexeme *oyd’-*. As the consulted sources contain no sentence examples, we are unable to say whether the two lexemes for ‘warm/hot’ are restricted to different frames of temperature evaluation, objects or degrees of temperature. Neither of the two Burji ‘warm/hot’ lexemes can be related to the cognate lexical root that is shared by all other HEC languages.³¹

The domain of cold temperature is more complicated. As far as the limited data allows us to say, most languages distinguish between ‘tactile cold’ and ‘non-tactile cold’. If we assume that this distinction was already made in Proto-HEC, then it must have become neutralized in Alaaba, K’abeena and Sidaama. The examples in the literature show that Alaaba/K’abeena *k’iiz-* and

²⁹ Interestingly, Koptjevskaja-Tamm (forthc.) shows that ‘warm’ is the most stable temperature term in Slavic languages, both with regard to meaning and form.

³⁰ Kambaata also has a nominal derivational morpheme *-an-áta*, which is, however, not used for the derivation of ‘warmth/heat’ from ‘warm/hot’ (Treis 2008: 165).

³¹ This was already observed by Sasse (1982: 14): “[A] number of characteristic diagnostic roots of HEC are lacking in Burji, e.g. (Sid.) i[i]bb- ‘warm’ [...], k’iida ‘cold’.”

Sidaama *k'iid-* are used both in the tactile and ambient frames of evaluation; see *k'iiz-* for tactile cold in (80) and for ambient cold in (81).

Alaaba³²

(80) ʔiibb^o: mookóonⁱ, k'iizzh^o: ʔangáanⁱ
ʔiib-y^o: mook-óonⁱ, **k'iiz-y^o**: ʔang-áanⁱ
 be(come)_hot-3mPFV spoon-fLI be(come)_cold-3mPFV hand-fLI
 'If it [= the food] is hot, with a spoon; if it is cold, with the hand.' (Schneider-Blum 2009: proverb 56; glosses adapted)

(81) ʔarriih^a fusshiyéʔ^e k'i[i]ziih^a ʔaagisshéʔ^e
 ʔarr-íih^a fussh-i-yé-ʔ^e
 sunlight-mDAT leave.CAUS1-EP-2pIMP-1sO
k'i[i]z-íih^a ʔaag-is-yé-ʔ^e
 cold-mDAT enter-CAUS1-2pIMP-1sO
 'For the sun, take me out, for the cold, take me in!' (Schneider-Blum 2009: excerpt of proverb 56; glosses adapted)

For 'cold', we find five (or six) non-cognate lexical roots in Table 13. The most common is *k'iid-* in Hadiyya, Sidaama and Gedeo, which is cognate to *k'iiz-* in Alaaba and K'abeena. The root is used as a general term for 'cold' in Alaaba, K'abeena and Sidaama, for 'non-tactile cold' in Hadiyya and for 'tactile cold' in Gedeo. Hudson (1989: 43) and, more tentatively, Leslau (1980: 128) hypothesize that Alaaba/K'abeena *k'iiz-* and Hadiyya *k'iid-* are cognate with Kambaata *gid-* 'non-tactile cold'. We are not convinced that this is the case for the following reasons: Firstly, we are unaware of any other lexemes in which Alaaba/K'abeena *k'* (\cong Kambaata orthographic *q*) corresponds to Kambaata *g*. Secondly, whereas both Alaaba/K'abeena and Kambaata *z* regularly correspond to Hadiyya and Sidaama *d* (see Leslau 1980), we are unaware of lexemes in which Kambaata has retained the Proto-HEC **d* and Alaaba alone has weakened it to *z*. Finally, no other cases are known in which Alaaba/K'abeena long *ii* corresponds to Kambaata short *i*. It seems more plausible that Kambaata *gid-* 'non-tactile cold' is a lexical innovation, admittedly of unknown origin.

The root *sigg-* is used for 'tactile cold' in Libido and Hadiyya and linked to the root *sigg-* 'comfortably cold or warm, cool' (§4.1.2.2) in Kambaata. Sasse (1982: 166) considers the Burji lexical root *sirg-* 'non-tactile cold' a cognate of *sigg-*, a proposal which was later taken up by Hudson (1989: 43). Sasse (1982: 112) relates the Burji root *kabb-* for 'tactile cold' tentatively to the Proto-East Cushitic root **k'ab(-b)-* for 'cold'. The Kambaata lexical root *caal-* /*c'aal-* 'tactile cold' is used neither by its closest relative Alaaba nor by any HEC language to express 'cold'. However, a possible Sidaama cognate, *c'aal-* '(to) shade (something)', can be found in Gasparini (1983: 54). At this stage of documentation, we are unable to link the last remaining root for 'cold', namely Gedeo *boojj-* 'non-tactile cold', to any phonologically similar and semantically related HEC root.

Hudson (1989) assumes that there was a lexical distinction between two types of 'cold' in Proto-HEC, which he labels 'cold (of food)' and 'cold (of weather)'. For reasons that he does not elaborate on, Hudson (1989: 43) links the proto-form **sirga* to the meaning 'cold (of food)' (= 'tactile cold') and the proto-form **k'iida* to the meaning 'cold (of weather)' (= 'non-tactile cold'). Given the data in Table 13, such form-meaning links need to be considered as very tentative.

³² The superscript vowel represents a devoiced vowel.

In addition to lexical differences, one also observes morphological differences among the HEC lexemes for ‘cold’. In Hadiyya and Sidaama, for instance, the adjectives for ‘cold’ are morphologically derived. According to Tadesse (2015: 43), the Hadiyya adjective *k’iid-aam-o* ‘non-tactile cold’ (82) is derived from the noun *k’iid-a* ‘cold weather’.³³ Hadiyya shares the propriative morpheme *-aam* with Kambaata (cf. Table 3 in §2).

Hadiyya

- (82) ʔotoór-ⁱ dʒaadʒur-*f*inse k[ʔ]jiiid-aám-o
 Ootooro-NOM Jaajura-ABL non_tactile_cold-PROP-PRED
 ‘Ootooro (= place) is colder than Jaajura (= place).’ (Tadesse 2015: 139; glosses adapted)

Furthermore, we find the derivational morphemes *-aall* in Hadiyya *sigg-aall-a* ‘tactile cold’ (Sim 1989: 127) and *-ad* in Sidaama *k’iid-ad-o* ‘cold’ (Gasparini 1983: 262); compare with the derived adjectives for ‘warm’ in Hadiyya and Sidaama above.

Information on the extended uses of temperature terms in HEC languages is sparse. A small number of examples in grammars and dictionaries show, however, that certain semantic extensions are probably shared. In Tadesse (2015: 234, 237, 250), the Hadiyya lexeme *iibb-* ‘be(come) warm/hot’ is used, as in Kambaata (§5.1.2), with the meaning ‘get enlivened, animated’. Sidaama shares with Kambaata the metaphor ANGER IS BURNING HEAT— see *fõggala* ‘be hot, burning; get angry’ (Gasparini 1983: 101). Furthermore, the ‘cold bargains’ (for cheap bargains) in Sidaama are reminiscent of the ‘cold market’ in Kambaata (§5.2.1), where only few customers come and prices have plunged. However, the ‘cold knives’ (for blunt knives) of Sidaama are unaccounted for in Kambaata. The use of ‘make cold’ for ‘settle (a matter, a dispute)’ in Hadiyya (Tadesse 2015: 129, 241, 251) is only at first sight identical to the Kambaata metaphor (§5.2.5): whereas Hadiyya uses the causative verb *sigg-is-* ‘make tactile cold’, Kambaata resorts to the cognate, but semantically different *sigg-is-* ‘make cool’ or to *gid-is-* ‘make non-tactile cold’.

7. Conclusion

Although Kambaata only has a system of two opposing primary temperature values expressed through three terms (‘warm/hot’ vs. (‘tactile cold’ vs. ‘non-tactile cold’)), the temperature system is full of interesting complexities, because lexical, constructional (morphosyntactic) and morphological distinctions intersect and contribute to the creation of a fairly intricate system. Depending on the criteria applied, either (i) tactile (as opposed to non-tactile) temperature, or (ii) personal-feeling (as opposed to outer) temperature, or (iii) warm personal-feeling temperature can be singled out.

OPPOSITION TACTILE VS. NON-TACTILE TEMPERATURE: Kambaata makes a clear **lexical** distinction between tactile and non-tactile temperature in the cold domain, i.e. between the perception of temperature by a body part through touching and by the whole body. This distinction is neutralized or not developed in the warm domain. The cold lexemes are thus frame-specific, whereas the warm term is frame-neutral (recall Table 4).

OPPOSITION INNER VS. OUTER TEMPERATURE: From a **morphosyntactic** perspective, Kambaata distinguishes between expressions of subjective, inner temperature (personal-feeling) and objective, outer temperature (tactile, ambient). If we focus on the most frequent construction type 1

³³ In contrast, Hudson considers *k’iid-a* to be an adjective (1989: 43, 289).

(§4.3.1), personal-feeling temperature is encoded in a transitive clause in which the experiencer is overtly expressed as direct object, while the subject slot is obligatorily empty. In contrast, the experiencer is merely implicit in the constructions expressing outer temperature: for tactile temperature, the subject slot is filled by the stimulus; for ambient temperature, the subject slot may be empty or optionally occupied by places, times or weather phenomena. Furthermore, personal-feeling temperature demands a verbal predicate – possibly because thermal comfort is conceptualized as dynamic and prone to change (cf. Koptjevskaja-Tamm 2015b: 18), while outer temperature expressions leave speakers a choice between the use of temperature verbs or adjectives. Last but not least, personal-feeling temperature takes a prominent place in the temperature system because it displays the richest constructional variation. Apart from the common transitive construction type 1, which is built on the ambient construction, personal-feeling temperature can also be expressed through constructions that are modeled on the tactile construction and which take body parts or the noun ‘body’ as the subject and the experiencer as possessor.

OPPOSITION WARM PERSONAL-FEELING TEMPERATURE VS. ALL OTHER TYPES: The expression of personal-feeling warmth/heat is special from a **morphological** point of view, as it requires the derived causative form of *iibb-* ‘be(come) warm/hot’ as transitive predicate.

Section 5 has discussed the extended uses of temperature terms in the domains of bodily sensation, emotion and personal character. The centrality of the distinction between tactile cold and non-tactile cold is also reflected in their non-overlapping semantic extensions; the first term maps onto negative meanings, the second term onto positive meanings. While many semantic extensions evidenced in Kambaata are not unique cross-linguistically, the absence of certain cross-linguistically common target domains (e.g. affection, sexual arousal) especially needs to be highlighted.

The comparative Section 6 demonstrated that the majority of HEC languages share with Kambaata the distinction between ‘tactile cold’ and ‘non-tactile cold’. Whereas the frame-neutral term for ‘warm’ is cognate across HEC with the exception of Burji, the terms for the two types of ‘cold’ are surprisingly varied and at least non-cognate roots have been documented.

Although a detailed account of the expression of temperature in Kambaata has been given, a number of questions remain open. We cannot exclude the possibility of dialectal differences in the expression of temperature in the Kambaata area. It would also be worth investigating whether the lexicalization patterns and semantic extensions of Kambaata are shared by other languages of the Cushitic family or the Ethiopian Linguistic Area. In this respect, one particular desideratum is a cross-linguistic study of personal-feeling temperature that would allow us to judge whether related or geographically adjacent languages also make a constructional difference between the expression of personal-feeling, tactile and ambient temperature. Finally, the diachrony of temperature terms in general, and the origin of the many ‘cold’-lexemes in particular, are still obscure in HEC.

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Abbreviations

A_	adjective	[N]	noun
ABL	ablative	N	pragmatically determined morpheme (function as yet unclear)
ADD	additive ('also', 'and')	NEG1	standard negator
[ADJ]	adjective	NEG2	imperative negator
APPR	apprehensive	NEG4	converb negator
BDV	benedictive	NEG5	relative negator
CAUS1	simple causative	NMZ1	nominalization marked by a long vowel
CNTR	contrast	NMZ4	nominalization with =r
COND	conditional	NOM	nominative
COP1	yoo-copula	O	object
COP2	-ha-/ta-copula	OBL	oblique
COP3	-Vt-copula	P	plural
DAT	dative	P_	pronoun
DEF	definite	PASS	passive
DEM1	proximal demonstrative	PCO	perfective converb
DEM2	medial demonstrative	PFV	perfective
DEM3	distal demonstrative	PL1	plurative -C
DM	discourse marker	PL2	plurative -aakk
DO	direct object	PLC	place
DS	different subject	PN	proper noun
EP	epenthesis	POSS	possessive; possessor
F	feminine	PRAG1-4	pragmatically determined morphemes (functions as yet unclear)
GEN	genitive	PRED	predicative
hon	honorific, impersonal	PRF	perfect
ICO	imperfective converb	PROG	progressive
ICP	instrumental-comitative-perlative	PROP	propriative
IDEO	ideophone	Q	question
IMP	imperative	QU	quality noun
INTJ	interjection	REAS1	reason clause with =tannée
IPV	imperfective	REL	relative
itr.	intransitive	S	singular
JUS	jussive	SBJ	subject
L	linker	SEQ	sequential
LI	locative, instrumental	SG	singulative
LOC	locative	tr.	transitive
M	masculine	[V]	verb
MID	middle	VOC	vocative
		VV	Vowel lengthening

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