Linguistics of weather: cross-linguistic patterns of meteorological expressions

Pål Eriksen

Norwegian University of Science and Technology

E-mail: pal.k.eriksen@ntnu.no

Seppo Kittilä

University of Helsinki

E-mail: kittila@mappi.helsinki.fi

Leena Kolehmainen

University of Eastern Finland

E-Mail: leena.kolehmainen@uef.fi

Abstract

This paper is a cross-linguistic investigation of meteorological expressions (such as *it is snowing* or *the wind blows*). The paper proposes a typology of meteorological constructions that are divided into three according to the element primarily responsible for the coding of weather. In the predicate type, a predicate expresses the meteorological event, while an argument has other functions. In the argument type, an argument is responsible for expressing weather, while any eventual predicate is semantically rather vacuous. In the argument-predicate type, finally, a predicate and an argument are both involved. All types include subtypes, depending on the syntactic valency and the parts of speech of the elements involved. Building upon the typology of constructions, a typology of languages is also proposed based on the coding of precipitation and temperature.

Keywords: expletive subjects, argument structure, meteorological expressions, syntax, typology

Linguistics of weather: cross-linguistic patterns of meteorological expressions

1. Introduction

In the eyes of linguists, such expressions are nearly as problematic and ill-behaved as the weather itself: they not only have many special properties, but from one language to the next the same phenomenon is coded linguistically in ways that are lexically or grammatically quite distinct. (Ronald Langacker 1999 [1991]: 365)

Weather is one of the common topics of everyday conversation around the world. It affects our daily life in multiple ways, and everyone has something to say about the current meteorological conditions. However, despite being a usual topic of everyday speech, linguistic aspects of weather have not been discussed cross-linguistically in depth thus far. Previous comparative works include Bartens' (1995) and Salo's (to appear) studies of meteorological expressions (= MEs) in Uralic languages, Bauer's (2000: 93-150) study on impersonal verbs including weather verbs in modern and ancient Indo-European languages, and Ruwet's (1986) study on structural variation in weather expressions (also Croft (1991: 141-142) and Keenan (1987: 103) discuss features of MEs briefly). These studies show, for example, that the strategies employed in Germanic languages (the expletive type) represent only one possible way of coding weather. Our paper will take a closer look at the linguistic variation attested in the expression of weather.

Langacker's (1999 [1991]) statement quoted above depicts how languages display considerable variation in the coding of meteorological events. First, there are evident differences between languages, as shown in (1)-(3):

German
(1) Es   regnet.
     it   rain.3SG
     'It is raining.'

Latin
(2) Pluit.
     rain.3SG
     'It is raining.'

Basque (Alba-Salas 2004: 76)

(3)　Euri-a　　　　　bota　　　zuen.

rain-DET.ABS　　throw　　have.PST.ABS(3SG).ERG(3SG)

'It rained.'

Example (1) involves a verb and an expletive subject. In (2), the construction consists of a verb only. Quite differently, in (3) a noun is used for coding a meteorological event, whereas the escorting, semantically less specialized, verb carries other kind of information.

Second, there is language-internal variation. Some languages, such as Digo, may code certain meteorological events in multiple ways (with slight differences in meaning):

Digo (Steve Nicolle, p.c.)

(4)　a.　I-na-nya.

9^{1}-CONT-rain

'It is raining.'

b.　Mvula　　i-na-nya.

9.rain　　9-CONT-rain

'Rain is raining.'

c.　Ku-na-nya　　　　mvula.

LOC-CONT-rain　　9.rain

'There is raining rain.'

d.　Ku-na　　　　mvula.

LOC-COM　　9.rain

'There is rain.'

The present paper concerns the linguistic expression of weather in and across languages whose study is especially interesting in the light of argument structure. Meteorological events do not include distinct and salient participants, such as agents and patients. This characteristic gives rise to our most central research question: how do languages cope with encoding events without proper participants, and what are the linguistic consequences of this. Our primary goal is to propose a formal typology of meteorological expressions, and, based on the typology of

---

[1] 9 = noun class of *mvula* 'rain' and subject concord of noun class 9.

constructions, to suggest a tentative typology of languages, focusing mainly on how languages encode precipitation.

The proposed typologies are based on reference grammars of individual languages and our own research on related topics. In addition, a sample of MEs in 25 languages was collected with the help of a questionnaire (see appendix 1). The complete amount of data is still too meagre to serve as a statistically refined sample, and this paper is thus intended as an exploratory effort into the typology of MEs. A final test of the hypotheses promoted in this paper will require further research on a larger scale. However, given the lack of cross-linguistic studies on the topic, we hope that this paper will be the necessary incentive for more extensive cross-linguistic research on MEs. We also believe that the typology proposed in this paper covers the basic types of meteorological expressions found in the world's languages, but due to the rather low number of languages, we will not present any statistical data in this paper.

The organization of the paper is as follows. In section 2, we discuss the lack of participants in meteorological events. In section 3, which constitutes the bulk of the paper, a formal typology of MEs is proposed. In section 4, the typology of constructions is complemented by a typology of languages. Section 5 summarizes the most relevant findings of the paper.

2 Meteorological events and participants

Perhaps the most defining feature of meteorological events is their lack of proper participants, such as agent and patient. Meteorological events differ in terms of whether one may conceptualize the given event as incorporating participant-like entities, but the general feature is that in none of these cases can any such entity be perceived as a participant which is referentially independent from the event itself. The lack of participants is most evident with temperature, like 'it is cold/hot'. The predicates *cold* and *hot* are quite easily referable to thematic participants in other contexts, as in 'the coffee is hot', but when the same predicates are used in meteorological expressions, there do not seem to be any specific entities they actually refer to, i.e. there are no easily conceptualized thematic participants. Other meteorological events may at first sight seem to offer potential candidates for grammatical participants, since entities like snow(flakes), rain(drops), hail(stones) and lightning(bolts) appear to be clearly involved in meteorological events? However, there are a number of reasons why they nevertheless do not count as typical participants.

First, the selection range of participants for each of these events is extremely narrow, arguably consisting of only the given participant from the list above. While 'dance' can select hundreds of

various participants (e.g. men, women, Cossacks dance), it is only snow that can snow and hail that can hail (disregarding metaphorical uses of the same verbs). In this respect, these entities are like so-called cognate objects, like the object in *to sing a song*. These entities are thus indistinguishable from the event itself. They constitute every instance of that event type, as opposed to the arguments in sentences like *I danced* and *The Cossacks danced*, which serve to distinguish between different instances of dancing.

Second, even though snow might be said to participate in snowing and hail in hailing, it is notoriously non-specific in doing so. While other events may pick particular referents from a set of semantically licit participants, events of precipitation do not. Even though only policemen are licit as subjects of the verb *to arrest*, tokens of arresting events can differ in terms of different, particular policemen, i.e. one can say *This/that policeman/Stephan Derrick arrested me*. On the other hand, we cannot specify the identity of the snow that is snowing, or the rain raining. This also demonstrates that snow, rain and hail do not constitute distinct participants, but rather are indistinguishable from the event itself.

Finally, the semantic roles of these entities are very hard to specify. The causes of meteorological events are beyond our control, which makes them different from prototypical controlling causers of events, i.e. agents. A meteorological event is rather something which simply happens. Moreover, although weather influences our daily routines and environment, meteorological events are not directly directed at other entities in order to affect them, nor are the meteorological events themselves affected. For instance, in the case of rain, is the water coming down from the sky doing something, or is rather something happening to it? It is impossible to distinguish the instigator from the result (see Croft 1991: 142). This lack of evident semantic roles is in a clear contrast to prototypical intransitive clauses describing the presence of one participant in an event, such as *The girl is running* or *The boy fell down*, which can be distinguished on the basis of semantic roles borne by participants.

We may therefore conclude that even though snow, rain, hail, lightning, etc. are inherent entities of different meteorological events, they do not act as independent participants with distinct semantic roles. In this semantic sense, events of precipitation are just as void of participants as events of temperature, and they all lack *distinct participants*. This accounts for the special linguistic features meteorological expressions tend to display. Nevertheless, we should not ignore the distinctions between meteorological events in this respect, and it will be shown later how meteorological events involving participant-like entities may be subject to typological patterns different from events without such entities.

One important consequence of the lack of distinct participants is that weather phenomena can be described in full just by a predicate; arguments are not needed for specifying the nature of the participants. This manifests itself in the argument structure of weather verbs, which in many languages take no (lexical) arguments (see also Bauer 2000: 100, 109) whence they have been labelled as *atransitive* by Van Valin & LaPolla (1997: 150). Consider:

       Finnish

(5)   Sataa.

       rain.3SG.PRES

       'It is raining.'

In Finnish, constructions expressing weather are complete without any other element present than the verb. In this sense, they differ from, for example, instances of pro drop, which can be complemented by a lexical element:

       Finnish

(6)   (minä)   juokse-n.

       (1SG.NOM)   run.PRES-1SG

       'I run.'

This is not to say that the "improper" participants referred to above cannot appear in meteorological expressions. Consider:

       Finnish

(7)   a.   Tuo   pilvi   sataa   pian.

             DEM   cloud.NOM   rain.3SG.PRES soon

             '(lit.) That cloud will soon be raining.'

       b.   Taivas   salamo-i.

             sky.NOM flash-3SG.PST

             'The sky was flashing/lightning.'

The important point is that entities like cloud and sky do not have the semantic and pragmatic features of ordinary event participants, as summarized earlier in this section, thus making the existence of the atransitive sentence in (5) possible.

In addition we may note that weather verbs may have other kinds of 'non-impersonal' uses, and take other kind of arguments as well, as illustrated in (8):

Finnish

(8) Lumi   pyrytt-i   tie-n   umpeen.
    snow.NOM   snow.hard-3SG.PAST road-ACC closed
    'The snow storm blocked the road.'

In (8), a weather verb is used transitively. This differs from the normal use of the verb in that 'road' does not constitute an integral part of a meteorological event. The participant encoded as subject is rather seen as a force responsible for the event and the participant expressed by the object as an affected patient. It is, however, important to note that we are not dealing with a canonical use of a weather verb in (8). Whether snow blocks a road or not does not have any effect on the meteorological event itself. This is a clear contrast to typical two-participant events (such as 'break' and 'paint') that are not complete without a patient. This lends more support to the fact that weather phenomena are independent and complete events in their own right. In the typology proposed in this paper, constructions such as (8) are not considered any further.

Of a completely different nature are deities that are explained as forces responsible for atmospheric conditions and encoded correspondingly as agents. Examples are known at least from classical languages, such as Latin and Homeric Greek (see Bauer 2000) and Uralic languages (Salo to appear, Bartens 1995), see:

Latin

(9) Juppiter   pluit.
    Jupiter   rain.3SG.PRES
    'Jupiter rains.'/ 'Jupiter sends rain.'

Mari (Salo: to appear)

(10) Jumo   kür-a.
     God   thunder-PRES.3SG
     'It is thundering.'

The semantics differ from other MEs is that deities are not integral parts of meteorological events, and they are represented an external participant responsible for the denoted event. The existence of

such sentences in an otherwise impersonal domain like MEs has an extra-linguistic explanation, as a religious context may allow the introduction of a divine, agentive participant to the event which otherwise would be semantically illicit.

3.   A formal typology of MEs

The pairing of predicate and argument seems to be the standard pattern of how events are formally encoded in typical transitive and intransitive clauses. The division of labour is clear; the predicate (typically a verb) describes the event and sets the participant frame, while the arguments specify the nature of the participants involved. A meteorological event, having no external participants, must rely on the typology proposed in this section for fitting into this pattern. Based on the element primarily responsible for coding weather, we have divided MEs into three major types. The types are labelled predicate type, argument type, and argument-predicate type. The three major types are further divided into subtypes, all of which will be discussed in light of cross-linguistic data. The types are illustrated schematically in Figure 1.

PREDICATE TYPE:	**VALENCY VARIATION:**
	Atransitive type
	Expletive type
	Intransitive predicate type
	Transitive predicate type
	PARTS OF SPEECH VARIATION:
	Verbal type
	Adjectival type
	Adverbial type
	Nominal type
	Locative type
ARGUMENT TYPE:	Intransitive argument type
	Existential type
	Transitive argument type
ARGUMENT-PREDICATE TYPE:	Cognate type
	Split type

Figure 1. Schematic illustration of the typology of meteorological expressions.

The focus of this section is on the illustration of the constructions languages employ for expressing weather. Only clausal constituents that are (or can be) involved in the expression of a given meteorological event are considered. Optional adverbs and adverbials lie outside the scope of this paper. The types are discussed in the order they appear in Figure 1.

3.1. Predicate type

MEs in which a predicate is responsible for denoting the given meteorological event, are in this paper viewed as instances of the predicate type. The predicate can be both verbal and non-verbal. If a syntactic argument occurs, it does not refer to the weather phenomenon itself, but has other (grammatically required) functions. The subtypology of the predicate type can be structured according to two independent scales of variables: syntactic valency of the predicate, and part of speech of the predicate. Each of these scales renders a set of subtypes.

3.1.1. Valency variation

3.1.1.1. Atransitive type

Constructions whose only (obligatory) element is a predicate referring to the denoted meteorological event are in this paper regarded as *atransitive*. The term has been adopted from Van Valin & LaPolla (1997: 150) who, however, use the term in a slightly different sense, since for them the label refers to all expressions that lack *semantic* arguments. In this paper, atransitive predicates are predicates which have a syntactic valency of zero arguments. We have opted for using this label in order to explicitly distinguish this type from intransitive predicates with a valency of one. The distinction is crucial in this context, even though its relevance may be questioned elsewhere. The atransitive subtype constitutes the purest instance of the predicate type, since syntactic arguments are completely absent, leaving only the predicate, and possibly also a supporting copula element. Examples of the atransitive type are found in (11)-(13):

Tukang Besi (Mark Donohue, p.c)

(11) No-wande(=mo).

3R-rain(=PERF)

'It is raining.'

Northern Akhvakh (Denis Creissels, p.c.)

(12) C̣'-āre   godi.

rain-PROG   COP

'It is raining.'

Italian (personal knowledge)

(13) È   freddo

be.3SG.PRES   cold.M

'It is cold.'

In Tukang Besi, the verb is in the third person singular form. In Akhvakh, the construction involves a lexical verb and a copula, and in Italian, an adjective and a copula.

The occurrence of atransitive constructions may first seem unexpected or counter-intuitive, because predicates typically require arguments (as they do in languages, such as English and Swedish). The atransitive nature of MEs is, however, very natural in light of the semantics of MEs discussed in Section 2. Intransitive constructions refer to events with one participant, usually coded as a subject, while transitive constructions describe events involving two participants expressed as subject and object. The lack of arguments in MEs can be explained in a similar fashion; meteorological events do not involve proper participants.

3.1.1.2. Expletive type

The expletive type differs from the atransitive type in having a non-referential element functioning as a (formal) subject. This element is referred to by a variety of names. We have here opted for the term *expletive subject*, but in the literature also *dummy subjects*, *formal subjects* or *pleonastic subjects* occur.

MEs illustrate classic examples of the use of expletives, but expletives are also found, for instance, in existential sentences ('There is a cat on the door step') and in sentences with extraposed infinite/subordinate clauses ('It is healthy to drink red wine'). In both cases, the argument that

would otherwise be the most likely candidate for subjecthood is found in a non-subject position, leaving the subject position open for an expletive to appear. Formally, expletives are typically realised either in the form of pronouns, like the English *it*-expletive, or as spatial adverbs, like the English *there*-expletive. Moreover, there is often language-internal variation in the form of expletives, with different expletives being licensed by different expletive-requiring contexts. In English and in many other North European languages (e.g. French, Dutch, German, Norwegian) MEs require a pronominal expletive, but this is not an absolute pattern. In Danish adjectival weather predicates allow both *there*-and *it*-expletives (14a-b), whereas weather verbs must take *it*-expletives (14c). Consider:

Danish (personal knowledge)

(14) a. Der   er   koldt   udenfor.
          there   be.PRES   cold.N.SG   outside
          'It is cold outside.'

      b. Det er   koldt   udenfor.
          it   be.PRES   cold.N.SG   outside
          'It is cold outside.'

      c. Det sner   udenfor.
          it   snow.PRES   outside
          'It is snowing outside.'

It should be noted that in certain Germanic languages expletives are only, or predominantly, used in the sentence-initial topic position, while they are either mandatorily or optionally dropped in a post-verbal position. In Icelandic, the post-verbal expletive dropping is mandatory, as shown in (15). It is, however, not restricted to meteorological predicates, but it is found in all expletive contexts:

Icelandic (Mohr 2004: 176)

(15) a. Það   rigndi   (í gær).
          EXPL   rained   (yesterday)
          'It rained (yesterday).'

      b. Í gær   rigndi   (*það).
          yesterday rained   EXPL
          'Yesterday, it rained.'

MEs form an important milestone in the development and grammaticalization of expletive subjects. In Germanic languages and French, verbs of these constructions were earlier impersonal subjectless verbs constituting "one-word-clauses" (Bauer 2000: 93). According to von Seefranz-Montag (1984: 526), Dal (1966: 166-167) and Lenerz (1992), the insertion of an expletive subject occurred first exactly with meteorological verbs that lack a topicalizable constituent. Only later, the use spread to other constructions.

It seems natural that languages employ neuter pronouns as expletive subjects, since they are semantically as neutral as possible and they are also less referential than pronouns with human references. However, some languages (and/or dialects) also allow human pronouns like 'he' or 'she' to appear as expletive subjects of MEs, but disallow them in all other contexts (such as existential clauses). This is attested, for example, in some Norwegian and Swedish dialects, Icelandic and Faroese. Consider:

Faroese (Thráinsson et al.2004: 287):
(16) Hann   kavar.
     he   snow.PRES
     'It is snowing.'

Examples in (14)-(16) illustrate the expletive type as it is attested in European languages. These are well discussed in theoretical syntax (e.g. Falk 1993, Vikner 1995, Svenonius 2002), but apparently the phenomenon has not been studied from a large cross-linguistic perspective earlier. The frequent occurrence of the type in European (especially Germanic) languages may give the (false) impression that the expletive type is the most common type of MEs. However, our survey has shown that the expletive type pattern is very rare outside Europe. It is therefore misleading to conclude that the type is common, let alone the standard pattern cross-linguistically, but it is rather an areal feature, typical of Northern and Western Europe. The existence of expletives in Hausa and Fulfulde might point to such a feature in Western Africa, but more research is needed to verify this[2].

3.1.1.3. Intransitive predicate type

---

[2] Interestingly, Dryer (2005) observes that Northwest Europe and Western Africa are the most prominent areas for the typological feature that pronominal subjects require full realization as such (i.e. as full pronouns in subject position, rather than as bound verbal morphology, or as agreement clitics, or freely left out without any other encoding). The existence of expletive subjects might thus be related to this feature..

In the intransitive predicate type, the subject is semantically richer than the purely grammatical non-referential expletive subject. The subject refers to background entities serving as the stage or source of the event. There is a fine line between the expletive type and the intransitive type, but we have opted for distinguishing between the types based on two criteria. First, the subjects of the intransitive type are etymologically nouns, and thus arguably referential items, while the purely formal pronouns and demonstratives of the expletive type are not. Second, the pronouns of the expletive type are commonly used as expletives also outside MEs, while the elements surfacing as subjects in the intransitive predicate type mostly do not appear as subjects in existential sentences or extraposition constructions. Elements appearing as subjects in the intransitive predicate type can be divided into three categories depending on whether they denote the locational, the temporal, or the atmospherical background (or source) of the event. All of these will be discussed below.

The use of locational subjects in meteorological sentences has previously been observed by Givón (2001: 119), who states that "[i]n some languages, the world may be the formal dummy subject of [meteorological] verbs". Although we do not follow Givón in analyzing such subjects as expletive subjects, our findings lend further support to the claim that such words can be used as meteorological subjects. Moreover, this is a widespread pattern, not only in the guise of a noun meaning 'world', but also 'place', 'nature', 'surroundings', 'land', 'ground', 'appearance', 'village', etc. Locational subjects are common across languages, and some examples are given in (17)-(19):

Palestinian Arabic (Givón 2001: 119)

(17) Id-dunya   ti-shti.
      ART-world   3F.SG-rain.IMPF
      'It is raining.'

Ma'di (Blackings & Fabb 2003: 88)

(18) Vʊ   kʹ-āgū.
      Earth/world/land   3-(N)-flash
      'It (lightning) is flashing.'

Udihe (Nikolaeva & Tolskaya 2001: 510)

(19) Ba: maga.
      place   bad.weather
      'to be bad weather/storm'

In all the languages above, a word referring to a place, world or Earth occurs as a kind of formal subject. The locational subject need, however, not always be realized in the syntax. For example, in San Carlos Apache MEs do not have overt subjects, but they require the "3s form, used when the subject is a space, area, environment, time, or 'things'." (de Reuse & Goode 2006: 118). Consider:

San Carlos Apache (de Reuse & Goode 2006: 118)

(20) a. Sidod.

hot

'It is hot.'

b. Go-zdod.

3S-hot

'The weather is hot.'

Temporal subjects, i.e. subjects based on nouns meaning 'day', 'time', etc., seem to occur somewhat more rarely than locational subjects, but they are attested, for example, Malagasy (21), Riau Indonesian (David Gil, p.c.), and Bozo Tigemaxo (22).

Malagasy (Keenan 1976: 254)

(21) Mafana   ny   andro.

hot   ART day

'It is hot.'

Bozo Tigemaxo (Thomas Blecke, p.c.)

(22) Waxadi   gu   gula.

time   ART   become.hot

'It has become hot.'

An interesting example of locational and temporal subjects is found in Samoan. If an NP referring to either the place or the time of the event is used in a Samoan ME, it cannot be encoded as an adverbial phrase, as in other sentences, but it must appear as the subject of the sentence, as in (23a-b). Only if *both* an NP referring to the place and an NP referring to the time occur simultaneously, will one of them be encoded as an adverbial phrase (as shown by the preposition *i*), whereas the other still has to be the subject (23c-d):

Samoan (Mosel & Hovdhaugen 1992: 418-419)

(23) a. Sā   timu Apia,   'ae   le'i   timu Satitoa.

       PST   rain Apia   but   not.yet   rain   Satitoa

       'It rained in Apia, but not in Satitoa.'

   b.   Sā   timu le   afiafi   ananafi.

       PST   rain ART afternoon   yesterday

       'It rained yesterday afternoon.'

   c.   Sā   timu Apia i   le   afiafi   ananafi.

       PST   rain Apia PREP   ART afternoon   yesterday

       'It rained in Apia yesterday afternoon.'

   d.   Sā   timu le   afiafi   ananafi   i   Apia.

       PST   rain ART afternoon   yesterday PREP   Apia

       'It rained in Apia yesterday afternoon.'

The next type of background subject consists of *atmospherical subjects*, which in this context comprise nouns meaning 'sky', 'weather', 'air', etc. Examples are given in (24) and (25):

Kham (Watters 2002: 234)

(24) Nəm wa-ke.

     sky   rain-PERF

     'It rained.'

Cantonese (Stephen Matthews, p.c.)

(25) a.   Go3 tin1 hou2ci5   soeng2   luk6 jyu5 gam2.

       CL   sky   seem   want   fall   rain   thus

       'It looks like it's going to rain.'

   b.   tin1hei3   hou2   dung3   aa3.

       weather   very   cold   PRT

       'It's cold.'

The occurrence of such nouns as a kind of formal subject in MEs is easily accounted for, since these nouns are referring to entities directly related to circumstances involving weather. Moreover, the word 'weather' is commonplace as a meteorological subject in languages like English (along with

probably in numerous other languages). It is perhaps not a surprise that this particular noun is often found in intransitive predicate expressions about weather (e.g. *The weather was cold*.).

We may also note that unlike expletive subjects, which are generally compulsory (at least in certain syntactic positions, see 3.1.1.2), the background subjects discussed above may be optional and in variation with the atransitive type. Often this construction is used only by a subset of the MEs, typically determined by semantic factors (see Section 4).

3.1.1.4. Transitive predicate type

The transitive predicate type comprises MEs that resemble the basic transitive constructions (with A and O) of the language in question. They thus typically include a subject and an object. An example is given in (26) (for more examples in Finnish, see Kolehmainen 2010a, 2010b):

Finnish (FTC: Helsingin Sanomat 1995)
(26) Kisasta oli ehditty ajaa noin kolmasosa
'We had driven one third of the race'

kun	harmaa	taivas	alkoi	vihmoa	vettä.
when	gray.NOM	sky.NOM	start.PST.3SG	drizzle	water.PART

'when it started to rain from the gray sky.' (lit, when the gray sky started to drizzle water)

The example in (26) is formally a transitive construction of Finnish, because it has a subject in the nominative case and an object in the partitive case.[3] The sky is conceptualized as an instigator of the denoted event, while the referent of the object is seen as an effected object. The verb *vihmoa* 'drizzle' is a synonym for rain, which means that the verb can be seen as primarily responsible for coding weather, whence (26) is seen as an example of the transitive predicate type.

The transitive predicate type is very rare cross-linguistically. We have not come across a single language in which the transitive predicate type would be the primary, let alone the only way of expressing weather. This is only expected in light of the nature of meteorological events discussed in section 2, and this underlines the peculiar nature of MEs when compared to other event types. Language may allow one non-typical element to surface as a subject (as in the intransitive

---

[3] The object may also appear in the accusative case in Finnish (see (8)).

predicate type), but allowing both an atypical subject and an atypical object seems to be highly marked.

3.1.2. Parts of speech variation

Apart from variation in terms of valency (from atransitive to transitive), the predicate type also varies according to the part of speech of the predicate. Verbs are the prototypical predicate words in any language hence the verbal subtype can be seen as the paradigm case of the predicate type as it is used to express meteorological events. The verbal subtype has been amply exemplified in the previous sections. In this section, we will focus on cases in which other parts of speech appear in MEs of the predicate type. Four subtypes, labelled as adjectival, adverbial, nominal and locative type will be distinguished.

3.1.2.1 Adjectival and adverbial type

The adjectival type includes cases in which an adjectival predicate is primarily responsible for expressing the described meteorological event. Examples are given in (27) and (28):

Serbian (Relja Vulanović, p.c.)

(27)   Vreme   je   sunčano.
       weather   be.3SG.PRES   sunny
       'The weather is sunny/the sun is shining.'

Greek (Stavros Skopeteas, p.c.)

(28)   O   cerós   íne   vroxerós.
       DEF.NOM.SG.M   weather.NOM.SG.M   be.3SG   rainy.NOM.SG.M
       'The day/weather is rainy.'

In Serbian, the construction illustrated in (27) is the most unambiguous way of referring to the meteorological event 'the sun is shining', i.e.' the weather is sunny'. Serbian can also use the verbal predicate type ('the sun shines') for this, but this construction may also refer to the mere physical fact that sun is shining, and not raining, for example. The verbal predicate can thus be used regardless of whether the sun is shining at the very moment. By contrast, (28) is far from being the only construction available for coding rain in Greek. Moreover, (28) is not completely synonymous

with, for example, an atransitive construction denoting rain, but there are semantic differences. Adjectival constructions have a more static reading, which is in line with their formal and semantic nature. In other words, examples such as (28) can be used to refer to the general nature of the weather during a longer period of time (e.g. 'the weather is rainy in the fall').

The adverbial type is, both formally and semantically, close to the adjectival type. Whether adverbs truly function as predicates, or if their syntactical configuration is rather that of an adverbial phrase is bit unclear. Nevertheless, some examples of this type involve copular verbs, like typical non-verbal predicates. Examples of the adverbial type, as the label is used in this paper, are found in (29) and (30):

       Volga Tatar (Teija Greed, p.c.)

(29) Kön qojash-ly.

       day   sun-ADV

       'The sun is shining.'

       Polish (Piotr Garbacz, p.c.)

(30) a.   Jest   chlodn-o   /wietrzn-ie   /deszczow-o.

              be.3SG.PRES   cold-ADV /windy-ADV   /rainy-ADV

              'It is cold / windy / rainy.'

        b.   *Jest   chlodn-e   /wietrzn-e   /deszczow-e.

              be.3SG.PRES   cold-N.SG   /windy-N.SG   /rainy-N.SG

              (For: It is cold/windy/rainy.)

Example (29) comprises a noun and an adverb only. This is the primary way of expressing the event 'the sun is shining' in Volga Tatar. In Polish, the construction also involves a copular verb. As can be seen in (30a-b), the adverbial form of Polish adjectives is not the same as a simple default neuter adjective declination. The element is thus clearly an adverb. True adjectives (in neuter adjective declension) are ungrammatical in this construction, as (30b) shows.

3.1.2.2. Nominal and locative type

The next subtype of the non-verbal predicate type is illustrated by the nominal type. As the chosen label implies, nouns function as predicators in these cases. Consider:

Finnish

(31) Nyt   on   pakkanen.

Now COP.3SG.PRES   below.zero.weather

'It is (very) cold.' (Lit. Now is below zero weather)

Example (31) involves a copula and a predicate noun. The construction is formally very similar to the existential construction of Finnish, but existential constructions typically have a locative element in the pre-verbal slot, in addition to which the subject usually occurs in the partitive case.

The locative type, in turn, consists of MEs involving a subject and a predicate nominal in a locative case:

Finnish

(32) Sää/taivas   on   pilve-ssä.

Weather/sky.NOM   COP.PRES.3SG   cloud-INESS

'The weather is cloudy.'

Example (32) has an atmospherical subject and a predicate nominal in the inessive case. It differs from the examples discussed in (27)-(31) mainly in the form of the predicator, which is a noun in a locative case in (32).

3.2.   Argument type

The argument type comprises constructions with an argument (most often realised as a subject) and a predicate, the argument being primarily responsible for denoting the meteorological event. This type constitutes the mirror image of the predicate type. Consequently, the predicate of the construction is semantically somewhat superfluous. Three subtypes of the argument type are distinguished below.

3.2.1. Intransitive argument type

The intransitive argument type comprises MEs that include both an argument and a predicate. The type thus differs from the atransitive predicate type in that both elements of the construction are grammatically required. In contrast to the intransitive predicate type, in turn, the argument of the construction refers to the denoted meteorological event, while the presence of the predicate is

grammatically required. In contrast to typical intransitive clauses, the number of verbs appearing as predicates is very limited and predicates cannot be replaced by others without affecting the idiomatic validity of the ME. In addition, in canonical intransitive clauses the verb is semantically central, and depending on it, the semantic role of the subject referent is interpreted differently.

There is considerable variation in the degree of desemantization, or semantic vagueness of the predicate that may appear in the intransitive type. In some cases, the verbs equal light verbs in light verb constructions (e.g. *take a nap*) having little semantic content of their own, and functioning as expression of features such as aspect, mood or tense. Examples include verbs such as 'happen' and 'come'. In other cases, the relation of the predicate to the denoted meteorological event is more evident, for example rain falls or thunder strikes. This kind of variation is semantically conditioned. For example, in Korean the verb 'come' can be used with anything falling down from the sky, as shown in (33a). Other meteorological events, such as thunder and wind, are referred to by using other verbs (examples in (33b-c) illustrate the split type to be discussed in section 3.3.2.).

Korean (Jae Jung Song, p.c.)

(33) a. Pi-ka   /nwun-i   /wupak-i   o-nta.
          rain-NOM   /snow-NOM   /hail-NOM   come-PLAIN.IND
          'It is raining/snowing/hailing.'

      b. Chentwung-i   chi-nta.
          thunder-NOM   beat-PLAIN.IND
          'It is thundering.'

      c. Palam-i   pwu-nta.
          wind-NOM   blow-PLAIN.IND
          'The wind is blowing.'

The predicates that may appear in constructions of the intransitive type also have other, lexical uses in languages that use the intransitive argument type for expressing weather, but when used in an ME, they are semantically less specific.

The intransitive argument type is attested in languages all over the globe. Two further illustrative examples are found in (34) and (35):

Motuna (Masayuki Onishi, p.c.)

(34) Hiing   ngo-wo-ito-no.
      wind   happen-3SG.S.MID-PRES.PROG-L

'The wind is blowing.'

Fongbe (Lefebvre & Brousseau 2002: 245)

(35) Jí   jà.

rain   falls

'It is raining.'

In (34) and (35), a nominal element refers a meteorological event, either wind or rain in the exemplified cases. Grammatically, the noun is best regarded as a subject, since it precedes the verb and the verb agrees with it in number. In addition, there are languages in which the only syntactic argument present is best regarded as an object due to its morpho-syntactic features. Examples are found in (36) and (37):

Greek (Stavros Skopeteas, p.c.)

(36) Ríxni   vrodés.

throw.3SG   thunder.PL.ACC.F

'It is thundering.'

Northern Sami (Salo: to appear.)

(37) Dahka-t   borgga   /arvvi

make-INF   snowstorm.ACC /rain.ACC

'To begin to snow heavily./To begin to rain.'

In (36), the argument bears accusative marking, and the accusatively marked noun does not trigger verbal agreement. Both of these features are characteristics of objects in Greek, because of which we have explicitly distinguished between (34)-(35) and (36). In the Sami example, the argument is marked as a typical object, by the accusative(-genitive) suffix. The variation in the grammatical function of the nominal element may be said to reflect the different conceptualization of meteorological events; the meteorological event may be seen as a causer-like element or as the outcome of the denoted process.

3.2.2. Existential type

The existential type comprises constructions that resemble existential constructions of the given languages. They usually involve a verb expressing existence, or a copula, in addition to the argument referring to the denoted meteorological event. Two examples are given in (38) and (39):

Greek (Stavros Skopeteas, p.c.)

(38) Éxi   katejída.
     have:3.SG   storm:ACC.SG.F
     'There is a storm.'

Gungbe (Enoch Aboh, p.c.)

(39) Akpɔkpɔ   tin.
     cloud   exist
     'There are clouds/it is cloudy.'

The examples above formally resemble constructions of the intransitive argument type, but as existential sentences often display special characteristics, they are treated as a separate category. In Greek, existential constructions involve the verb 'have' and a noun in the accusative case. In Gbe, the noun mandatorily precedes the verb 'exist' in existential constructions, even though the word order is otherwise less strict (see Lefebvre and Brousseau 2002: 149 for Fongbe).

3.2.4. Transitive argument type

The last manifestation of the argument type is illustrated by constructions that resemble the transitive constructions of the languages in question. As meteorological events lack proper participants, we may predict that the transitive type (both predicate and argument) is rare cross-linguistically, a prediction that is verified by actual linguistic data. The best example of the type we have come across is found in (40):

Northern Akhvakh (Denis Creissels, p.c.)

(40) Miλi-de   gõʁwel-āri   duna.
     sun-ERG   illuminate-PERF   world
     'The sun is shining.' (Lit. 'The sun has illuminated the world.')

The verb of (40) is a typical transitive verb meaning 'illuminate/light'. The verb can also be used transitively in other contexts, such as 'the lamp illuminates the room'. The construction also involves two nouns, functionally an A and an O. The formal transitivity of the construction is underlined by the ergative marking of A. Together, these elements amount to the meaning 'the sun is shining'. Example (40) has features in common with the argument-predicate type to be discussed in the next section. In both the transitive argument type and the argument-predicate type, all the elements are relevant. We have, however, distinguished between these two constructions. The main reason for this is that in the argument-predicate type, both elements of the constructions refer to weather. In (40), in turn, the nominal elements are more important in this regard, since replacing either noun with another noun would yield a non-ME construction.

3.3. Argument-predicate type

In this section, we proceed to discussing MEs in which the expression of weather is divided between argument and predicate. The type is consequently labeled as the argument-predicate type. Different instances of the type can be subdivided according to whether both elements express more or less the same information, or whether they are responsible for different facets of a single event. The former subtype is labeled here as the cognate type, while the latter is labeled as the split type.

3.3.1. Cognate type

The cognate type resembles both the intransitive predicate type and the intransitive argument type formally, since all these cases involve an argument and a predicate. The essential difference between the types is found in the nature of the elements. In the cognate type, both elements refer to the same meteorological event, and either of them would in principle alone suffice. Typical examples are given in (41)-(43):

Toqabaqita (Frank Lichtenberk, p.c.)
(41) Thato   e   thato.
     sun   3SG.NFUT   (sun)shine
     'The sun is shining.'

Udihe (Nikolaeva & Tolskaya 2001: 510)
(42) Bono   sagdä-nku   bono-ini.

Hail large-PL   hail-3SG

'Large hail is falling', i.e. 'it is hailing.'

Ma'di (Blackings & Fabb 2003: 87)

(43) Èjí   ō-dï   rá.

   Rain   3-rain AFF

   'It did rain.'

The examples above illustrate somewhat different manifestations of the cognate type. Example (41) illustrates a case in which the argument and the predicate are clearly of the same origin, and they are phonologically identical. The same applies to (42), where the formal resemblance of the nominal and verbal elements is also relatively evident. In both cases, the verbal element displays verbal features (e.g. verbal agreement) which distinguishes between the two elements. Moreover, in Udihe, the noun-like nature of *bono* is highlighted by the fact that it can be modified by an adjective (or another noun, see Nikolaeva & Tolskaya: ibidem). The Ma'di example differs from (41)-(42) in that the two elements are only semantically similar and seem to express the same information; formally, their resemblance is not as obvious.

The cognate type is an intransitive reflection of the use of cognate objects in certain transitive uses of otherwise intransitive verbs, like *to dance a dance*. The potential meteorological participants like 'snow' and 'rain' have the same semantic relationship to snowing and raining as cognate objects have to their events, i.e. being indistinguishable from the event itself.

3.3.2. Split type

In the cognate type, the two elements of the constructions express basically the same information and refer to the same meteorological event. In the split type, however, the two elements together describe the meteorological event, but each element encodes a different facet of the event. Instances of the split type can be subdivided according to whether the predicate or the argument can be seen as primarily responsible for weather coding. Examples (44) and (45) illustrate MEs, where the argument is more closely associated with the expression of weather:

Motuna (Masayuki Onishi, p.c.)

(44) Hiing hurir-u-ito-no.

   wind   blow-3S.ACT-PRESPROG-L

'The wind is blowing.'

Volga Tatar (Teija Greed, p.c.)

(45) Hawa   achyl-a.

weather   open(MID)-PRES.3SG

'It is clearing up.'

The arguments in (44) and (45) are entities related to meteorological events. The predicates are, however, semantically less vacuous than the predicates of the intransitive argument type.

The opposite of (44) and (45) is illustrated below by cases in which the predicate is the primary indicator of the meteorological event denoted, whereas the argument specifies the nature of the process. Consider:

Romanian (Andrei Dumitrescu, p.c.)

(46) Plonă   cu   grindină.

rain.3SG   with hail

'It is hailing.'

Northern Akhvakh (Denis Creissels, p.c.)

(47) Ža(ri)   c̣'-āre   godi.

ice   rain-PROG   COP.N

'It is hailing.' (Lit. 'Ice is raining.')

Finnish

(48) a.   Sataa   vet-tä   /lun-ta   /räntä-ä

rain.3SG.PRES   water-PART   /snow-PART   /sleet-PART

/rake-i-ta.

/hail-PL-PART

'It is raining/snowing/sleeting/hailing.'

b.   [...] vesi   sataa   vaakataso-ssa. (FTC: Keskisuomalainen 1999)

water.NOM   rain.3SG.PRES   horizontal-INESS

'It is raining horizontally.'

c.   Sato-i   ensilume-n.

rai.PST-3SG first.snow-ACC

'The first snow (of the winter) fell onto the ground.'

In (46)-(48), the predicate ('rain') distinguishes the denoted meteorological event – precipitation – from other meteorological events. The verb alone suffices for describing weather, and the argument, whose function is to specify the type of precipitation, is optional. In Romanian and Northern Akhvakh, the argument distinguishes between rain and hail. In Finnish, nouns can be used to refer to all kinds of precipitation. The default reading of the verb *sataa* is 'it is raining', which is also the only possible reading if the argument is left out. As a result, the arguments referring to 'water' (rain) seem redundant in (48a-b). They are, however, natural if it is, for instance, important to underline the nature of the substance coming down from the sky. The grammatical nature of the argument also varies above. In Romanian, the argument surfaces as an oblique marked by a preposition. In Northern Akhvakh, in turn, it is a preverbal subject-like element. In Finnish, the argument may take variety of forms. It can occur in the nominative case, as in (48b), in the partitive case, as in (48a) and also in the accusative case, as in (48c) (Kolehmainen 2010a, 2010b).

4. A tentative typology of languages

4.1. Preliminaries

In the previous section, we have proposed a typology of *constructions* used for coding weather. In this section, we will propose a tentative typology of *languages* based primarily on the coding of precipitation vs. other weather phenomena in the discussed languages. In order to do so, we will at first make some theoretical assumptions about our typology of constructions.

 As shown above, one language may utilize a number of different construction types for expressing weather. Further examples of this are given in (49)-(50):

Russian (personal knowledge)

(49) a. Idet   dožd´.
    go.3SG.PRES rain
    'It's raining.'

  b. Kholodno.
    cold.SG.N.PRED

'It's cold.'

English

(50) a.   it's raining

     b.   the rain is falling

Russian utilizes the argument type to denote raining (49a), and the predicate type to express cold temperature (49b). In English, the variation within the same event may be between the predicate type (*it is raining*) and the argument type (*the rain is falling*) (see also (4) from Digo). The variation exemplified in (49) and (50) might make a typology of constructions seem trivial (and even impossible to construct), and inadequate as a basis for a typology of languages. However, on closer scrutiny there are restrictions even here, as will become clear below. We make the following assumption: the existence of the argument type *is* a trivial fact of languages; the existence of the predicate type (and the argument-predicate type) is not. This claim will be elaborated below.

It seems plausible to claim that all languages allow NPs to refer to entities involved in certain meteorological events. These entities have already been dealt with in section 2, i.e. "quasi-participants" like 'snow(flakes)', 'rain(drops)', 'sun', 'lightning', etc. Even though such entities do not necessarily function as proper participants in meteorological events, they may do so elsewhere:

English

(51) a.   The road is blocked by snow.

     b.   The sun is a yellow disk.

     c.   Did you see that lightning?

If such NPs are usually available, it follows that any language will be able to create argument type MEs by combining such NPs with an appropriate verb or predicate, even though a given language does not necessarily have this as its main idiomatic strategy for coding weather. English, for instance, has the expletive predicate construction *It's raining* as its main option for encoding a raining event. The possibilities of expressing a raining event within the confines of the argument type instead are only limited by ones imagination:

English

(52) a.   The rain is oozing from the clouds.

     b.   Raindrops are racing towards the ground.

      c.   Rain is approaching from the West

We should thus not be surprised by the existence of argument type MEs. We will therefore argue that the key to language variation in MEs is whether languages allow the predicate type.

This leads us to our second theoretical assumption: the predicate type is a customized option for MEs – a special structural application in this semantic field – as opposed to the seeming structural triviality of the argument type. We have argued that while meteorological phenomenona are coded by arguments in the argument type and by a predicate in the predicate type, the other element in each type is less relevant to the expression of weather. But there is a difference in the degree of semantic emptiness between the two types. The supportive predicate in the argument type is never truly empty, but it always has a semantic meaning of its own, like 'fall', 'come', 'exist', 'go', etc. If the verb were indeed truly empty, we would rather expect such verbs to always be copulas, which are often argued to be semantically void. The predicate type, in turn, has the possibility of leaving its argument position truly empty – either in the form of a semantically empty expletive subject, or by simply leaving the argument out entirely.

In light of the semantic features of meteorological events outlined in section 2, i.e. that such events cannot readily be split up into predication and participants, it follows that both the argument type and the predicate type strive to achieve an isomorphic encoding of this fact by expressing the meteorological phenomenon only in one part of the common argument-predicate-structure while trying to leave the other part of the structure "empty" – but only the (expletive and the atransitive) predicate type *really* achieves this. The argument type still employs a fundamentally standard argument-predicate-structure, even though the role of the predicate is kept to a minimum, or has bleached into an idiomatic irrelevance.

In section 2, a distinction was made between meteorological events which do not have any inherent participants, like temperature, and events that do involve participant-like entities, like precipitation events, but these entities do not function like proper participants. Note that the triviality of the argument type depends on the availability of such participant-like entities, hence a clarification is necessary: the triviality of the argument type holds only for precipitation events and other events of this type. Temperature might not as easily lend itself to argument type constructions, unless they do it through NPs , like 'heat' or 'cold'. Instead, temperature may be the ground where the more "customized" predicate type first arises[4].

---

[4] The same predictions (and results, in many of the languages which have been checked) hold for events of daylight conditions like *It is dark* or *It's getting brighter*.

We thus claim that precipitation events quite naturally lend themselves to argument type coding, but they are more restrictive towards predicate type coding, and all languages will not allow the latter option. In contrast, one should not be surprised if there is a tendency for temperature events to adopt predicate type encoding, and if there is a clear distinction in the encoding of these two groups of events. In the following section we will explore this prediction more in detail, with particular focus on precipitation events.

4.2. A typology of precipitation encoding

The strictest encoding pattern for precipitation events is the one where only the argument type is allowed for such events. This encoding pattern is frequent in languages of Eurasia, and it will be referred to as *argument p-encoding*[5]. An illustrative example is Russian, where precipitation events are coded by an argument type construction with the verb *idti* ('go') as its supportive verb (53a). This strict argument encoding of precipitation is in clear contrast to temperature, which predominantly uses predicate type encoding (53b) (see also (49a) and (49b)):

Russian (personal knowledge):

(53) a. Idet   sneg.
          go.3SG.PRES   snow
          'It's snowing.'

      b. kholodno.
          cold.SG.N.PRED
          'It's cold.'

Further examples from Eurasia are found in Albanian and Ainu (similar constructions are attested also in, e.g., Khalkha Mongolian, Persian, Japanese, Korean, Lhasa Tibetan, Lezgian), see:

Albanian (Dalina Kallulli, p.c.)

(54) a. Bie   borë.
          fall.3SG.PRES   snow
          'It's snowing.'

      b. Është   ftohtë.

---

[5] It should be understood throughout this section that 'p-encoding' is not the encoding of MEs in general, but the encoding of precipitation expressions.

be.3SG.PRES   cold

'It is cold.'

Ainu (Anna Bugaeva, p.c.)

(55) a.   Apto /ukas   /kawkaw   as.

            rain /snow   /hail   stand

            'It is raining / snowing / hailing.'

      b.   Sir-popke.

            appearance-be.warm

            'The weather is warm.'

In all the languages above, the distinction between precipitation and temperature is evident. Notice that the subtype of the predicate type employed for coding temperature in these languages may vary. While Russian and Albanian use the atransitive predicate type, Ainu employs the intransitive predicate type, but the formal distinction between precipitation and temperature remains.

In the languages above, the standard encoding of the precipitation event relies on some semantically bleached supportive verb, like *go* in Russian and *fall* in Albanian. In a number of other languages, this supportive verb has developed one step further. Due to its association with precipitation, the verb has seemingly acquired 'to precipitate' as one of its meanings, maybe even the only meaning, and it can also alone encode the most unmarked type of precipitation, namely rain. If a more marked type of precipitation is to be expressed, an argument occurs. Usually, an argument referring to rain can optionally occur if rain is coded. Finnish is an excellent example of this. The precipitation verb, *sataa* 'rain', originally meant 'to fall' (Hakulinen 1999: 195). One may thus hypothesize that earlier Finnish was like Albanian, encoding precipitation with a pure argument type, based on the supportive verb 'to fall'. In modern Finnish, however, the original meaning has been lost and *sataa* can now only mean 'to rain', or 'to precipitate' (non-literal uses aside, see (56a)). If it is to express events of snowing or hailing, arguments must be added (see (56b-c). Temperature, in turn, is encoded with the predicate type (56d):

Finnish

(56) a.   Sataa   (vet-tä).

            rain.3SG.PRES   (water-PART)

            'It's raining.'

      b.   Sataa   lun-ta.

rain.3SG.PRES   snow-PART

'It's snowing.'

c.   Sataa   rake-i-ta.

rain.3SG.PRES   hail-PL-PART

'It's hailing.'

d.   On   kylmä-ä.

be.3SG.PRES   cold-PART

'It's cold.'

The Finnish pattern is attested in many other languages as well, and we will refer to it as *generalized p-encoding*. Further examples are found in (57) and (58):

Hungarian (Éva Dékány, p.c.)

(57) a.   Esik   (az   eső) /a   hó.

fall.3SG.PRES   (the rain) /the snow

'It's raining/snowing.'

b.   Hideg   van.

cold   be.3SG.PRES

'It's cold.'

Swahili (Vitale 1981: 57-58)

(58) a.   (Mvua)   / theluji   i-na-nyesha.

(rain)   / snow   9-PRES-fall

'It's raining.'

b.   Ku-me-tanda.

17-PERF-spread.out

'It is overcast.'

In section 2, we argued that potential meteorological participants, like 'rain', are not proper participants, as they cannot be distinguished from the events they are parts of. However, generalized p-encoding is a strategy of approaching such a distinction between participant and event. We could claim that the generalized predicate is abstracted away from the respective events, and the distinction between the different events is thus realized through different distinctive participants like 'snow', 'hail' and 'rain'. However, it is disputable whether these participants are actually similar to

mazurka, polka and tango as objects of the verb *to dance*, and whether they might thus be seen as different types of cognate arguments. This may, however, explain why generalized p-encoding exists as an alternative to the more customized predicate p-encoding (see below).

Languages vary according to whether the generalized p-encoding is based on a verb expressing precipitation only, or if this verb has a primary/secondary use as a motion verb. Finnish *sataa* has developed into a verb of precipitation, as it seems to be with Swahili *–nyesha*[6]. On the other hand, Polish *paść* is still clearly recognizable by Polish speakers as cognate with a root meaning 'fall', but it is hardly used for anything else but precipitation. The ordinary verb for falling is the same root plus the prefix *s-*, i.e. *spaść*.

An intermediate type between argument p-encoding and generalized p-encoding is found in Turkish. Turkish expresses precipitation events with a generalized verb, *yağmak*, but unlike languages such as Finnish, it rarely drops its argument when coding rain:

Turkish (Zeynep Orhan, p.c.)

(59) a.　Yağmur　　yağ-iyor.

　　　rain　　　　rain-PROG.PRES.3SG

　　　'It's raining.'

　　b.　Ka　/dolu　　yağ-iyor.

　　　snow /hail　　　rain-PROG.PRES.3SG

　　　'It's snowing/hailing.'

Unlike other languages with generalized p-encoding, Turkish arguably is still strongly bound to the standard pattern of requiring both an argument and a predicate. Even though one could expect the presence of a verb like *yağmak* to liberate the raining expression from this pattern, this only rarely happens, and *yağmak* is usually forced to co-occur with the cognate argument *yağmur*.

This leads us on to another strategy of going beyond the trivial argument p-encoding, namely by encoding precipitation consistently with the argument-predicate type. Similarly to languages with generalized p-encoding, these languages also use precipitation predicates to express precipitation, but they are nevertheless bound to the standard pattern with semantically full arguments, i.e. also the argument encodes precipitation. We will refer to this as *argument-predicate p-encoding*. In the North Vanuatu languages Mwotlap, Bislama, Araki and Hwi precipitation events

---

[6] It should be noted that the general Swahili verb for 'to fall', *-anguka*, can be used with *theluji* ('snow') as a general expression for 'It's snowing.'

are encoded by the argument-predicate type, while temperature is encoded by the intransitive predicate type format (Alex François, p.c.). Two examples are found below:

Mwotlap (François 2001: 342 & 715)

(60) a. Na-smal   me-smal.
      ART-rain   PFT-rain
      'It is raining.'

b. Mahē   no-momyiy   /ne-sew.
      place   STA-cold   /STA-warm
      'It is cold/warm.'

Bislama (Alex François, p.c.)

(61) a. Ren   bae   i   ren.
      rain   FUT   PRED   rain
      'It's going to rain.'

b. Ples   i   kolkol
      place   PRED   cold
      'It's cold / still night.'

For some of these languages, a precipitation argument is optional, which makes them labile between predicate p-encoding and argument-predicate p-encoding:

Latvian (Sturla Berg-Olsen, p.c.)

(62) a. (Lietus)   lyja.
      (rain)   rain.3SG.PRES
      'It is raining.'

b. (Sniegas)   sninga.
      (snow)   snow.3SG.PRES
      'It is snowing.'

Finally, there are languages that code precipitation consistently with the predicate type, i.e. languages with *predicate p-encoding*. In Europe, this seems to be restricted to a few subfamilies of languages, namely the Germanic, Romance and Sami languages. Otherwise, European languages,

like many other languages of Eurasia, employ one of the other types of p-encoding. This type seems to be the common encoding type among North American Indian languages:

North Saami (Mariet Julien, p.c.)

(63) a. arvá

rain.3SG

'It is raining'

b. Muohttá

snow.3SG

'It is snowing'

Choctaw (Broadwell 2006: 32, 266)

(64) a. Oba-tok.

rain-PST

'It rained.'

b. Óba-cha   oktosha-h.[7]

rain.LGRADE-SS   snow-TNS

'It rained and snowed.'

Kwaza (Hein van der Voort, p.c.)

(65) Awe-ki.

rain-DEC

'It is raining/it rained.'

The typology of p-encoding is summarized in figure 2, where argument p-encoding and predicate p-encoding are presented as extreme oppositions, as far as how much weight is put on the predicate to encode precipitation, and where generalized p-encoding and argument-predicate p-encoding constitute each their own type of intermediate position. English paraphrases in italics are used to exemplify the types. A tempting hypothesis is that the diachronic development of p-encoding follows this figure as a scale from left to right, where argument p-encoding is the most

---

[7] Interestingly, in view of the discussion of subjects, participants and (a)transitivity in meteorological predicates, the sentence in (64b) can alternatively be expressed with the different-subject (DS) affix –na on the verb form óba-, but the same-subject affix seems to be more common (Broadwell 2006: 266).

'trivial' way of encoding precipitation, and predicate p-encoding the pattern most 'customized' for meteorological expressions, but testing this hypothesis will have to wait for future research.

	Generalized p-encoding *(it/place) rains, snow rains*	Predicate p-encoding *(it/place) rains, (it/place) snows*
Argument p-encoding *rain falls, snow falls*	Argument-predicate p-encoding *rain rains, snow snows*	

Figure 2: The scalar typology of p-encoding

The typology above is meant as a prototype-typology. More fine-grained intermediate examples than those presented so far do exist. For instance, although Hungarian has here been classified as having generalized p-encoding, it should be added that the event of snowing can just as well take predicate p-encoding, with the verb *havazik*:

Hungarian (Éva Dékány, p.c.)

(66) Havazik

snow.3SG.PRES

'It's snowing.'

Hailing, however, can only take generalized p-encoding. Hungarian thus shows a tendency towards predicate p-encoding, but it still predominantly employs generalized p-encoding. Also Polish has a verb meaning 'to snow' (*śnieżyć*), but unlike the Hungarian *havazik* it is used more rarely than generalized p-encoding for the same event, putting Polish a bit closer to the generalized p-encoding prototype than Hungarian.

The main point of the typology above is the distinction between argument p-encoding and the rest, the former exemplifying how languages try to force their p-encoding into the structure of ordinary intransitive and transitive clauses, while all the latter exemplify various steps away from this standard pattern towards the 'customized' predicate p-encoding. Almost all of these languages allow predicate encoding for temperature. This distinction between precipitation and temperature (+ daylight conditions, see Fn. 4) leads to the following two conclusions:

1. Even though precipitation often is quoted as the primary example of meteorological events, it seems that these events are the last to adopt an encoding pattern which is especially customized for meteorological events (i.e. the predicate type), even though most languages allow this encoding for other meteorological events.

2. There must be a feature inherent to precipitation events functioning as a tough, but not insurmountable barrier to the adoption of predicate p-encoding. This most probably follows from the fact that it is possible to conceive of precipitation as a kind of participant, even though it has been indicated that 'snow' and 'rain' are not semantic participants in a proper sense. Temperature and daylight, on the other hand, are concepts which are much harder to conceptualize as involving any participants[8]. As far as other MEs are concerned, like wind, lightning and thunder, we have too little data to say anything specific yet.

4.3. Other cues for a meteorological typology of languages

The typology of p-encoding is the most promising lead so far for a typology of languages, but a few other possible parameters do exist. Some of these are discussed in this section.

First, if a language has adopted the predicate type, it often seems to be faithful to only one (valency dependent) subtype of the predicate type. For instance, in Germanic languages the predicate type is usually realized by the expletive subtype. The atransitive subtype is only allowed in certain limited syntactic contexts in Icelandic and Faroese (see above), and even though the intransitive subtype exists in English, it is used mostly only metaphorically (e.g. *The room was raining feathers*). The status of the expletive subtype as a parameter in a typology of languages is even more enforced by the observation that it seems to be restricted to certain language areas.

While the intransitive subtype seems to occur in some languages, like English, in other languages there seems to be a grammaticalized intransitive construction which predicate type MEs may or must adhere to, like the use of the word *hava* ('air', 'weather') in Turkish, *ba:* ('place') in Udihe, etc. (see 3.1.1.3.). This might suggest that we are dealing with as an independent language type. However, more research is needed before we can establish a language typology on these grounds.

---

[8] It should be noted, though, that in a number of languages temperature and daylight events diverge from precipitation by employing the intransitive subtype of the predicate type. It could be that the general surroundings, i.e. "world", "land", "air", etc., are seen as more easily conceptualizable as participants in temperature and daylight events.

Finally, returning to the encoding of various meteorological events, we have shown how the encoding of precipitation is subject to language variation, but the encoding of temperature has, as a counterpoint, been presented as leaning towards predicate type encoding. However, there are language particular restrictions also here. For example, in Polish expressions of this type must be of the adverbial subtype of predicate encoding. Even though temperature is otherwise encoded with ordinary adjectives, they cannot be used as adjectival predicates in MEs:

Polish (Piotr Garbacz, p.c.)

(67) a. Jest chlodn-o
be.3SG.PRES cold-ADV
'It is cold.'

b. *Jest chlodn-e
be.3SG.PRES cold-NSG
(For: 'it is cold')

In Hungarian, on the other hand, even though temperature is encoded with adjectives, such MEs do not pattern with ordinary adjectival predicates (which are expressed without copula in the 3rd person present, and are negated with the negator *nem*, as in (68a)), but with existential sentences (which require the copula in the 3rd person present, and are negated with *nincs*) (68b-c):

Hungarian (Éva Dékány, p.c.):

(68) a. János (nem) éhes.
János (NEG) hungry
'János is (not) hungry.'

b. Hideg van /nincs hideg.
cold be.3SG.PRES /NEG.EXT cold
'It's cold.' / 'It isn't cold.'
(Rounds 2001: 93)

c. Nincs igazság a földön.
NEG.EXT justice DEF world.SUPERESS
'There is no justice in the world.'

One could argue that Hungarian temperature expressions employ the existential argument type, but the problem is that there is no evident NP referent which could be said to "exist" in (68b), only the

adjective *hideg*. Whether this is a very special subtype of the predicate type, or an equally special subtype of the existential argument type, cannot be determined at the moment, but what the Polish and Hungarian data show us, is that there is still a lot of research to be done on temperature expressions, and on meteorological expressions in general.

5.   Summary

In this paper we have presented a typology of MEs, a pioneer attempt in this field, as very little work has been done on meteorological events from a linguistic point of view earlier, and to the best of our knowledge, nothing in terms of modern linguistic typology. The given typology categorises constructions used for MEs, and on the basis of this some attempts at a typology of languages have been made, in particular how languages encode precipitation events. Apart from this typological mapping, we have also given an overview of the semantic nature of meteorological events, both concerning event types and semantic roles (or the lack thereof).

The core of our typology stems from a semantic peculiarity of meteorological events. MEs do not involve any canonical participants, such an agent or a patient. Other events involve at least one such participant, and consequently most events are typically coded formally with both a predicate and at least one argument, this consequently being the standard form of a clause. Meteorological events try to conform to this standard pattern in various ways, even though their event semantics do not provide for both a predicate and an argument. This leads to a three-fold typology: (1) The predicate type, where the meteorological event is encoded as a predicate, and where any eventual argument is either semantically empty or irrelevant to expressing the event as such; (2) the argument type, where the meteorological event is encoded as an argument, and where the predicate is largely semantically irrelevant to expressing the event as such, and functions more like a supportive verb; (3) the argument-predicate type, where the meteorological event is encoded in the form of a predicate and an argument simultaneously. Each type comprises a number of subtypes, depending on factors like syntactic valency, the parts of speech of the elements involved, and other relevant features.

Typological variation of languages in terms of the constructions listed above seems to depend on how they are used to encode different meteorological events. Whereas events of temperature easily adopt the predicate type, precipitation events seem to be much more "resistant". The tentative typology we propose basically distinguishes between languages with argument precipitation encoding, where precipitation events must take the argument type construction, and languages with

predicate precipitation encoding, where the predicate type construction is allowed and is the norm for precipitation events. In between these two types there are a number of intermediate language types, depending on how closely they approach predicate p-encoding. Other cues for a typology of languages may exist, in particular considering how the predicate type is realized across languages, but much more research is needed in this field before a complete meteorological typology of languages can be presented.

The list of abbreviations

3R	3. person realis form	IMPF	Imperfective
3SGSmid	3. person singular middle	IND	Indicative
3SACT	3. person singular active	INDET	Indeterminative
ABS	Absolutive case	INESS	Inessive case
ACC	Accusative case	INF	Infinitive
AFF	Affirmative	L	Local gender
AO	Aorist	LGRADE	Low grade
ART	Article	LOC	Locative case
ADV	Adverb	M	Masculine
CL	Classifier	MID	Middle
COM	Comitative case	N	Neuter
CONT	Continuative	NEG	Negative
COP	Copula	NFUT	Non-future
DEF	Definite	NOM	Nominative case
DEC	Declarative	NPST	Non-past
DEM	Demonstrative	PART	Partitive
DET	Determinative	PERF/PFT	Perfective
ERG	Ergative case	PL	Plural
ESS	Essive case	PLAIN.IND	Plain indicative
EXPL	Expletive subject	PRED	Predicative
EXT	Existential	PREP	Preposition
F	Feminine	PRES	Present tense
FUT	Future	PRESPROG	Present progressive
ILL	Illative case	PREV	Preverb

PROG	Progressive	SS	Same subject
PRT	Particle	STA	Stative
PST	Past	SUPERESS	Superessive case
PST-PTCP	Past participle	TNS	Tense marker
REFL	Reflexive	VE	Ventive prefix
SG	Singular		

References

Alba-Salas, Josep 2004. Lexically Selected Expletives: Evidence from Basque and Romance. *SKY Journal of Linguistics* 17: 35–100. (Electronic version available at: http://www.ling.helsinki.fi/sky/julkaisut/sky2004.shtml)

Bartens, Raija 1995. Suomalais-ugrilaisten kielten meteorologisista ja muita luonnonolosuhteista merkitsevistä ilmauksista (on the meteorological expressions in Finno-Ugric languages). *Journal de la Société Finno-Ougrienne* 86: 33–65.

Bauer, Brigitte 2000. *Archaic syntax in Indo-European: the spread of transitivity in Latin and French*. Berlin/New York: Mouton de Gruyter.

Blackings, Mairi & Nigel Fabb 2003. *A Grammar of Ma'di*. Berlin/New York: Mouton de Gruyter.

Broadwell,George Aaron 2006. *A Choctaw Reference Grammar*. Lincoln: University of Nebraska Press.

Croft, William 1991. *Syntactic Categories and Grammatical Relations. The Cognitive Organization of Information*. Chicago/London: The University of Chicago Press.

Dal, Ingerid 1966. *Kurze deutsche Syntax auf historischer Grundlage*. Tübingen: Niemeyer.

De Reuse, Willem J. & Phillip Goode 2006. *A Practical Grammar of the San Carlos Apache Language*. Munich/Newcastle: Lincom Europa.

Dryer, Matthew 2005. Expressions of pronominal subjects. *The world atlas of language structures*, Martin Haspelmath, Matthew Dryer, David Gil and Bernard Comrie (eds.), 410–413. Oxford: Oxford university press.

Falk, Cecilia 1993. Non-referential Subjects in the History of Swedish. PhD diss, University of Lund.

FTC = Finnish Text Collection. Electronic document collection of the Finnish language containing 130 million words. Gatherers: Department of General Linguistics, University of

Helsinki; University of Joensuu; CSC - Scientific Computing Ltd; and Research Institute for the Languages of Finland. Available through CSC, http://www.csc.fi/.

François, Alexandre 2001. Contraintes de structures et liberté dans l'organisation du discours. Une description du mwotlap, langue océanienne du Vanuatu. PhD dissertation, Université Paris-IV Sorbonne.

Givón, Talmy 2001. *Syntax – An Introduction, Volume I*. Amsterdam/Philadelphia: John Benjamins.

Graczyk, Randolph 2007. *A Grammar of Crow*. Lincoln: University of Nebraska Press.

Hakulinen, Lauri 1999. *Sanat on kaikki sarvipäitä. Lauri Hakulisen kirjoituksia ja puheita vuosilta 1926–1974*. (words all come with horns on their heads. Essays and speeches by Lauri Hakulinen between 1926 and 1974). Edited and collected by Auli Hakulinen, Pentti Leino & Tiina Onikki. Suomalaisen Kirjallisuuden Seuran Toimituksia 745. Helsinki: SKS.

Keenan, Edward L. 1976: Remarkable Subjects in Malagasy. *Subject and Topic*, Charles N. Li (ed.), 249 – 301 New York: Academic Press.

Keenan, Edward L. 1987: Towards a universal definition of 'subject of'. *Universal grammar: 15 essays*, Edward L. Keenan (ed.), 89–120. London: Croom Helm linguistics series.

Kolehmainen, Leena 2010a. Sääverbien syntaksia ja semantiikkaa: semanttiset roolit, osallistujien vaihteleva käsitteistäminen ja sääverbien vaihteleva valenssi (The syntax and semantics of meteorological verbs: semantic roles, the varying conceptualisation of participants, and the varying valency of meteorological verbs.). *Virittäjä* 114(1): 5–38.

Kolehmainen, Leena 2010b. Fennosaxonische Wettervalenzen. Turbulenzen im Valenzverhalten deutscher und finnischer Witterungsverben. *Infinite Kontrastive Hypothesen. Beiträge des Festsymposiums zum 60. Geburtstag von Irma Hyvärinen*. Leena Kolehmainen, Hartmut E.H. Lenk & Annikki Liimatainen (eds.), 59–84 Frankfurt a.M.: Lang.

Langacker, Ronald W. 1999 [1991]. *Foundations of Cognitive Grammar. Volume II. Descriptive Application*. Stanford: Stanford University Press.

Lefebvre & Brousseau 2002. *Fongbe*. Berlin: Mouton de Gruyter.

Lenerz, Jürgen 1992. Zur Theorie syntaktischen Wandels: Das expletive *es* in der Geschichte des Deutschen. Erklärende Syntax des Deutschen. Studien zur deutschen Grammatik 25, Werner Abraham (ed.), 99–136 Tübingen: Narr.

Mohr, Sabine 2004. Clausal architecture and subject positions: impersonal constructions in the Germanic languages. PhD dissertation, University of Stuttgart. Available at: http://elib.uni-stuttgart.de/opus/volltexte/2004/2012/pdf/Dissertation_Mohr.pdf

Mosel, Ulrike & Even Hovdhaugen 1992. *Samoan Reference Grammar*. Oslo: Scandinavian University Press.

Newman, Paul 2000. *The Hausa Language: An Encyclopedic Reference Grammar*. New Haven: Yale University Press.

Nikolaeva, Irina & Maria Tolskaya 2001. *A Grammar of Udihe*. Berlin/New York: Mouton de Gruyter.

Rounds, Carol 2001. *Hungarian. An essential grammar*. London & New York: Routledge.

Ruwet, Nicolas 1986. On weather verbs. CLS 22. Part 1. Chicago Linguistic Society. Papers from the General Session at the Twentysecond Regional Meeting. April 17-19, 1986. Chicago, Illinois: Chicago Linguistic Society: 195–215.

Salo, Merja (to appear): Meteorological verbs in Uralic languages – are there any impersonal structures to be found. Impersonal constructions: A cross-linguistic perspective, Andrej Malchukov & Anna Siewierska (eds.). Amsterdam: John Benjamins.

Svenonius, Peter (ed.) 2002. *Subjects, Expletives and the EPP*. Oxford: Oxford University Press.

Thráinsson, Höskuldur, Hjalmar P. Petersen, Jógvan í Lon Jacobsen & Zakaris Svabo Hansen 2004. *Faroese: An Overview and Reference Grammar*. Tórshavn: Føroya Fróðskaparfelag.

van Valin, Robert & LaPolla, Randy 1997. *Syntax*. Cambridge: Cambridge University Press.

Vikner, Sten 1995. *Verb Movement and Expletive Subjects in the Germanic Languages*. Oxford: Oxford University Press.

Vitale, Anthony J. 1981. *Swahili syntax*. Dordrecht: Foris Publications.

von Seefranz-Montag, Ariane 1984. 'Subjectless' constructions and syntactic change. *Historical syntax*, Ficiak, Jacek (ed.), 521–554. Berlin: Mouton de Gruyter.

Watters, David E. 2002. *A Grammar of Kham*. Cambridge: Cambridge University Press.

Appendix 1: Language sample in the questionnaire

AUSTRONESIAN: Kuni, East Mekeo, Motu, Toqabaqita, Tukang Besi

EAST BOUGAINVILLE: Motuna

INDO-EUROPEAN: Bangla, Czech, Dutch, Greek, Romanian, Serbian, Slovak

KOREAN: Korean

KWAZÁ: Kwazá

NAKH-DAGHESTANIAN: Northern Akhvakh

NIGER-CONGO: Digo, Gungbe, Ikwere, Swahili

SINO-TIBETAN: Mandarin

TURKIC: Volga Tatar, Turkish

URALIC: Erzya (Mordvin), Finnish.

Appendix 2: Additional languages in the examples:

Ainu, Albanian, Basque, Bislama, Bozo Tigemaxo, Cantonese, Choctaw, Danish, English, Faroese, Fongbe, German, Hungarian, Icelandic, Italian, Kham, Latin, Latvian, Ma'di, Malagasy, Mari, Mwotlap, Northern Sami, Palestinian Arabic, Polish, Russian, Samoan, San Carlos Apache, Udihe