CHAPTER I

LINGUISTIC EXPRESSION OF PERCEPTION AND COGNITION: A TYPOLOGICAL GLIMPSE

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Every language has a way of talking about seeing, hearing, smelling, tasting and touching. In about a quarter of the world's languages, grammatical evidentials express means of perception (visual, and non-visual) and information source in general. Lexical verbs covering perception and cognitive processes may or may not form a special subclass of verbs. Their meanings vary. In some languages verbs of vision subsume cognitive meanings (knowledge and understanding). In others, cognition is associated with a verb of auditory perception, touch, or smell. Grammatical, and lexical, expression of perception and cognition share a number of features. 'Vision' is not the universally preferred means of perception. In numerous cultures, taboos are associated with forbidden visual experience. Vision may be considered intrusive and aggressive, and linked with access to power. In contrast, 'hearing' and 'listening' are the main avenues for learning, understanding and 'knowing'. The studies presented in this book set out to explore how these meanings and concepts are expressed in languages of Africa, Oceania, and South America. The final section of this chapter offers an overview of the volume.

1 SETTING THE SCENE

Every language has a way of referring to basic sources of sensory perception: through sight, through hearing, through smell, through taste and through touch. Every language has a way of speaking about how one knows what one is talking about, and what one thinks about what one knows. In every language, there are ways of phrasing inferences, assumptions, probabilities and possibilities, and expressing disbelief. The expression of perception and of cognition — thinking, understanding and 'knowing' things — spans grammar and lexicon.

The purpose of this volume is to offer a number of case studies — each based on firsthand data on previously undescribed or poorly known languages — dealing with various aspects of the linguistic expression of perception and cognition. These can be encoded in grammar, through dedicated means for grammatical expression of information source known as 'evidentiality', perceptual distinctions in demonstratives, overtones of various complementation techniques, and many more.

As Franz Boas (a founding father of modern linguistics) put it, languages differ not in what one can say but rather in what kind of information must be stated (Boas 1938: 132). A certain concept can be expressed grammatically in one language but only by lexical means in another. For example, a certain language may have a two gender system (masculine and feminine), while another may have three genders, and yet another one may have no grammatical gender at all — just words for 'man' and 'woman'. Information acquired by seeing something can be expressed through the demonstrative system in one language, and through a special 'visual evidential' in another, while a third would just use a lexical verb 'see, look'. The ways of expressing information source are summarised in §2.

Every language of the world has lexical items (typically, verbs) of perception and cognition. This volume sets out to provide case studies on this so far understudied field in linguistics, dealing with the connection between language and the senses, and the variety of perceptual language cross-linguistically. There are other possibilities of organizing the senses socially than
those frequently referred to in earlier work on the topic – as Majid and Levinson (2011:7) point out, ‘languages are windows on the senses that we can hardly afford to ignore’. Of course, the notions of perception and cognition are relevant not just for linguistics. They have been in the centre of attention of a variety of other disciplines, among them psychology, philosophy, and anthropology in their various guises.

Anthropological perspective is another matter. The ways in which visual and auditory perception are conceptualized within a language may correlate with cultural practices, transmission of knowledge and ways of communication. Vision is the preferred 'sense' in many, especially Western, cultures (Ong 1982). Hearing is highly valued in others. Vedic texts in Hindu India are a case in point. These sacred verses are transmitted through oral recital (notwithstanding the fact that they also exist as written texts; cf. Levering 1989). In pre-colonial Hindu societies, knowledge of the Vedic texts was off-limits to members of lower castes. The Ramayana describes how boiling lead was poured into the ears of a lower-caste person who might accidentally overhear a Brahman reciting Vedic verses. Hearing something one is not allowed to may be dangerous. This contrasts with the 'danger' of seeing something one is not supposed to; examples include the punishment of Lot's wife in the Book of Genesis, and various taboos on women catching a glimpse of magic flutes in the East Sepik and North Amazonian cultures (§4).

It is certainly the case that other senses, besides vision, can be culturally salient. It has been suggested that Western culture correlates 'smell' with primitivity and barbarism (Corbin 1996, Beer 2000, Raab 2001). This idea permeates Patrick Süskind's novel Perfume. In other cultures, smell is associated with the maintenance of social order. For example, among the Kapsiki of Cameroon, the blacksmiths as a social group are identified with the smell of its totemic animal (Van Beek 1992, 2010). Various senses such as smell and touch have played an important role in the conceptualization of social categories such as gender, holiness and marginality (see, for instance, Classen's 1998 seminal work). Since late antiquity, the 'inversion' of smells has been a symbol of 'holiness': the feces and rotting flesh of Christian saints and martyrs would smell of honey and flowers. The body would thus symbolize beauty, and ultimately salvation.

As Hill and Irvine (1992: 17) put it, 'knowledge is a social phenomenon'. So are the means of its acquisition — among them 'seeing' and 'hearing'. This is why a study of perception and cognition in any language would be incomplete without at least a glimpse into the ways of talking about perception, and the ways of knowing things.

In some languages, the expression of cognition is associated with hearing, seeing, smelling, or feeling in general. The concept of knowledge may be associated with auditory perception; the roots for this are likely to lie in the group's social history and attitudes to knowledge. Correlations between sensory perception and cognitive processes are as diverse as the cultures they occur in. There is hardly any doubt that universal claims concerning the preferred status of 'vision' (e.g. Viberg 1983, Sweetser 1990) are highly Eurocentric, and do not hold for the majority of non-Western societies.

In §4, we address possible social and cultural motivations for the expression of perception and cognition across the world's languages. A brief summary is in §5. The final section, §6, focuses on the aims, and the structure, of this volume.

We now turn to a bird's eye view of grammatical devices covering various means of perception, and the ways of knowing things.

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1 Similar values are attributed to smells among the Dassenech of Ethiopia: one distinguishes one's own group from other groups by smell (Almagor 1987). Further examples are in Finnegan (2002) and Drobnick (2006).
In a number of the world's languages, every sentence must specify the information source on which it is based — whether the speaker saw the event, or heard it, or inferred it based on visual evidence or on common sense, or learnt it from another person. As Franz Boas (1938: 133) put it, 'while for us definiteness, number, and time are obligatory aspects, we find in another language location near the speaker or somewhere else, source of information — whether seen, heard, or inferred — as obligatory aspects'. This is the essence of evidentiality as grammaticalized information source, the topic of our next section.

2.1 Evidentiality as grammaticalized information source

Evidentiality is a grammatical category which has source of information as its primary meaning — whether the narrator actually saw what is being described, or made inferences about it based on what they’d seen, or was told about it.

Tariana, an Arawak language (Brazil), has five evidentials marked on the verb.

- If I see José play football, I will say 'José is playing-naka', using the VISUAL evidential.
- If I heard the noise of the play (but didn't see it), I will say 'José is playing-mahka', using the NON-VISUAL evidential.
- If all I see is that José's football boots are gone and so is the ball, I will say 'José is playing-nihka', using the INFERENTIAL evidential.
- If it is Sunday and José is not home, the thing to say is 'José is playing-sika', using the ASSUMED evidential since my statement is based on the assumption and general knowledge that José usually plays football on Sundays.
- And if the information was reported to me by someone else, I will say 'José is playing-pidaka', using the REPORTED evidential.

Using a wrong evidential leads to miscommunication, and social exclusion: someone who does not use evidentials correctly would be deemed incompetent. Omitting an evidential can produce ungrammatical and unnatural sentences.

Expressions related to information source are heterogeneous and versatile. They include closed classes of particles and modal verbs, and a potentially open-ended array of verbs of opinion and belief. The term 'lexical evidentiality' is misleading in that it obscures these differences.

3 We now go through some features of evidential systems, and perceptional meanings associated with them.

2.1.1 General features of evidential systems

Evidential systems vary in their complexity. Some distinguish just two terms. An eyewitness versus non-eyewitness distinction is found in Turkic and Iranian languages, in Luwo, a West-Nilotic language (Chapter 2), in !Xun, a Khoisan language (Chapter 3) and in Tima (Alamin, Schneider-Blum and Dimmendaal forthcoming). Other languages mark only non-firsthand

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2 A further terminological remark is in order. Many linguistic terms have a counterpart in the 'real world'. 'Time' is what our watch shows. The term 'tense' refers to a grammaticalized — and limited — set of terms we have to use in a particular language. Along similar lines, 'evidentiality' is a category whose real-life counterpart is information source. Hardly any linguist will say that English has a 'yesterday' past tense, because there is a word for 'yesterday'. Similarly, it makes no sense to call verbs 'see' or 'hear' lexical evidentials (as done in Diewald and Smirnova 2010).

3 Further details on evidential systems, their nature and development can be found in Aikhenvald (2006a), (2006b), (2007), (2011a,b). Aikhenvald (2006a) is a comprehensive typology of evidential systems world-wide. A detailed overview of evidential systems in Amazonian languages is in Chapter 9 of Aikhenvald (2012).
information, for example, Abkhaz, a Northwest Caucasian language. Numerous languages, including Estonian, express only reported, or hearsay, information.

In a two-term system of eyewitness versus non-eyewitness (or firsthand versus non-firsthand), each term is semantically complex. The non-firsthand evidential in !Xun covers any kind of information which the speaker did not witness. This evidential subsumes what one has inferred, assumed or heard from another person through hearsay. The same evidential also has overtones of doubt and information one does not vouch for (§3.3 of König, this volume). The firsthand evidential is used to express what one has seen or heard — that is, apparently any type of sensory experience. This kind of evidential system is not uncommon cross-linguistically (see Aikhenvald 2006a: 26-9, 154-8). But this is the first time ever such system described for an African language — which is what makes König's chapter a breakthrough.

Evidential markers may be compulsory in every clause, as, for instance, in Tariana (Arawak: Aikhenvald 2003), or Quechua (Chapter 4). Or they may just appear once per paragraph: this is the case in Baniwa of Içana, from the Arawak family (Aikhenvald 2002). In !Xun, evidential particles are only used if the speaker chooses to focus on the information source.

Evidentials may or may not have epistemic extensions, to do with probability and speaker's evaluation of the trustworthiness of information. The visual evidential in Quechua can refer to information the speaker vouches for (in Chapter 4, Adelaar mentions the relationship between evidentiality and certainty in Tarma Quechua). The non-firsthand evidential in !Xun may refer to something one does not know for certain (Chapter 3, this volume). In contrast, the nonvisual evidential in Tariana can refer to something one cannot quite see, but never to any overtones of doubt (a special dubitative modality expresses this meaning). Reported evidential in Estonian has an overtone of doubt. This is akin to how 'they say' in English may imply that the speaker does not really believe what is being reported. In contrast, in Quechua, Shipibo-Konibo and Tariana, the reported evidential does not have any such overtones.

Evidentiality does not bear any straightforward relationship to truth, or the validity of a statement, or the speaker's responsibility. Speakers of languages with evidentials can manipulate them to tell clever lies. Christa König (Chapter 3, examples 12 and 13) shows how one can use the wrong information source and the correct lexical item. Or one can use the right information source and the wrong lexeme.

Evidentiality is not a subcategory of the verbal category of modality or aspect. In fact, in many languages aspect, modality and evidentiality can be expressed within one grammatical word (see Aikhenvald 2006a, and chapters in Aikhenvald and Dixon 2003).

The maximum number of evidential specifications is found in past tenses, and in perfective aspect. This is easy to understand: the primary meaning of a perfective is to do with focusing on the results of an action or a process. An inference can be made based on the results or traces of a previous action or state. That is, a perfective form can easily develop overtones of a non-firsthand evidential, and it is with respect to the result that firsthand or non-firsthand information is easy to distinguish (see Comrie 1976: 110; Aikhenvald 2006a: 112-16).

In Luwo, just like in many other languages of the world, evidentiality (eyewitness versus non-eyewitness) is distinguished in perfective aspect only (Storch, this volume), similarly to Shilluk, from the same family (Gilley and Miller 2007). Luwo is among the very few instances of evidentiality in Africa — which makes this system particularly exciting.4

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4 However, a different evidential system is found in Maaka, a Chadic language (see Storch forthcoming, and Coly and Storch (in preparation)). This suggests that African languages are much more diverse in terms of grammatically marking information source than previously assumed.
2.1.2 Evidentials and their meanings
Semantic parameters at play in languages with grammatical evidentiality cover physical senses, several types of inference and of report. The recurrent terms are: 5

I. VISUAL covers evidence acquired through seeing.
II. SENSORY covers evidence through hearing, and is typically extended to smell and taste, and sometimes also touch.
III. INFERENCE is based on visible or tangible evidence or result.
IV. ASSUMPTION is based on evidence other than visible results: this may include logical reasoning, assumption or simply general knowledge.
VI. REPORTED is used for reported information with no reference to who it was reported by.
VII. QUOTATIVE is used for reported information with an overt reference to the quoted source.

The means of perception grammaticalized within evidential systems include VISION and OTHER SENSORY perception. The latter typically covers auditory perception and anything one cannot see (examples in Aikhenvald 2006a: 173). Only a handful of languages have a special evidential just for what one has 'heard' with one's own ears. 6

As far as we know, no spoken language has a special evidential to cover just smell, just taste, or just feeling. However, Catalan Sign Language is reported to have a special evidential marking smell (Sherman Wilcox, p.c.). This raises a question concerning the cognitive motivation for grammaticalizing one information source rather than another one, depending on the kind of language — whether spoken or signed. The issue goes beyond our present scope.

Not all evidentials are equal, in terms of their marking and their use.

2.1.3 The privileged status of visual evidential
An evidential which covers information acquired through VISION tends to be special. In many languages with evidentiality, the visual evidential, or the evidential which expresses firsthand information, typically acquired through vision or sensory source, is less formally marked than other evidentials. In Bora (Witotoan), Koreguaje (West Tucanoan) and Hup (Makú), visual evidentials are formally unmarked. In Archi (a North-East Caucasian language), in Yukaghir (a Paleo-Siberian isolate) and in Retuarã (an East Tucanoan language), the unmarked verb implies that the speaker had witnessed the action or state with an appropriate sense (typically, saw, heard, or smelt something). 7 Along similar lines, in Luwo (§1.2 of Chapter 2), non-eyewitness evidential is marked with prefix nàà, while the eyewitness term does not receive a special marker.

What if I see something, and hear it, and can make inferences and assumptions about it all at the same time? In many languages, the visual evidential is the preferred — and functionally unmarked — choice when one has access to more than one information source, that is, if one saw something, heard it, and was told about the same thing at a further point in time. This was described for Tuyuca (Barnes 1984), for Kashaya (Oswalt 1986: 43) and then further developed in Aikhenvald (2006a: 307-8; 2012: Box 9.1).

But stating that one 'has seen' something one actually has not may be inappropriate. Aymara,

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5 Based on an update of Aikhenvald (2006a). Earlier classification of evidential meanings are now outdated (see a comprehensive bibliography and summary in Aikhenvald 2011b).

6 The few examples of that come from highly endangered languages, and are hard to interpret: Aikhenvald (2006a: 36-7).

7 See Aikhenvald 2006a for these and other examples, and references. In Tariana (Arawak) and many neighbouring East Tucanoan languages visual evidential is the least formally marked (Aikhenvald 2002).
an Andean language, has an obligatory system of evidentials reminiscent of Quechua in its organization and its structure. In her insightful study of the Aymara speech practices, Hardman (1986: 132-3) reminds us that every Aymara child is taught an important proverb: 'Seeing, one can say: "I have seen", without seeing one must not say "I have seen"'. In the Tariana and Tucanoan-speaking communities, a shaman, with his supernatural powers, can 'see' things which an ordinary person does not have access to. 'Seeing' is thus a correlate to privileged access to knowledge as power.

Persons who overuse the visual evidential may be dangerous: they may have hidden powers of a shaman. This special status of vision as the preferred information source is reflected in another Aymara proverb 'Seeing, speak; without seeing, don't speak' (Hardman 1986: 132-3).

What is so special about visually obtained information? We return to this in §5.

2.2 Information source through means other than evidentials

In many languages, epistemological meanings — to do with how one knows things — can be expressed without a dedicated form whose primary meaning is information source. A conditional mood in French, a perfect aspect in Georgian, desubordinated participles or a passive voice in Lithuanian have developed evidential-like meanings as a 'side effect'. These are known as 'evidentiality strategies'.

Meanings related to perception — visual or auditory — can be encoded within the grammar through other systems. A number of languages have a grammatical system of demonstratives with one or more terms referring to visible objects. Visibility in deictic systems may correlate with proximity to the speaker, and/or to the addressee and/or to a third person. Kwakiutl, a Wakashan language with at least three evidentiality terms (Boas 1910), has six demonstratives, with an obligatory visible/non-visible distinction: 'visible near me, invisible near me; visible near thee, invisible near thee; visible near him and invisible near him'.

The exact semantic content of what is covered by 'visible' and 'invisible' varies from grammar to grammar. Palikur (Arawak) distinguishes objects in the speaker's hand, those near to speaker and to hearer, those far from both but visible, and those far and invisible (Aikhenvald and Green 1998). 'Visibility' of the object is often a concomitant feature of near deixis; this is the case in Tariana hihi 'this (emphatic) near you and me'.

Audibility appears to also be relevant for some demonstrative systems: 'non-visible' objects may be audible. Muna (Austronesian: van den Berg 1997: 199-201) has a seven-term system: 'near speaker', 'near addresssee', 'away from speaker and addressee, but nearby', 'far away, lower than or level with point of speaking or orientation', 'far away, higher than point of speaking or orientation', 'not visible (may be audible), unspecified for time', and 'not visible, was in view but no longer is'. Santali (Munda: Neukom 2001: 42-4) has a special series of demonstrative pronouns (used as modifiers in a noun phrase and also adverbially) referring to what is seen, or to what is heard.

Dyirbal (Australian: Dixon 1972, R. M. W. Dixon p.c.) has a three-term system of noun markers: bala- 'referent is visible and not near speaker'; yala- 'referent is visible and near speaker'; and Nala- 'referent is not visible (but may be audible or remembered from the past)'. There is also a set of verb markers which have some morphological correspondence with noun markers. They provide locational qualification for the verb. The markers with initial Na- refer to

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9 A comprehensive typological overview of demonstratives and their meanings is in Dixon (2010b: 223-61).
something non-visible and inaudible, as in (1), non-visible but audible, as in (2), and something remembered from the past, as in (3). The relevant forms are underlined:

(1) ña-n-galu$_s$
    jañja ban$_s$ garii$_s$
    NON.VISIBLE:ABS.FEM-OUT.IN.FRONT NOW THERE:ABS.FEM sun
    the sun (which could not be seen) was going away out in front now (i.e. setting)

(2) ñayi-n-galu$_s$
    bayi$_s$ bani-ñu
    NON.VISIBLE:ABS.MASC-LINKER-OUT.IN.FRONT THERE:ABS.MASC come-PAST
    he could be heard coming along out in front

(3) ña-gu-l-daya
    bulunja-gu
    NON.VISIBLE-DATIVE-MASC-MID.DISTANCE.UPHILL FATHER’S.FATHER-DATIVE
    añja ñayba banagay-gu
    NEW.ACTION 1sg return-PURPOSIVE
    and I'm going back to my father's father remembered place a medium distance uphill (to die there)

This is an example of a rather unusual system whereby a deictic-type marker has a wide range of perceptual meanings. This is in addition to numerous lexical ways of expressing the notion of 'seeing, looking'.

No demonstrative system has yet been found which would have a special term for information acquired through smell or touch. This is similar to evidentiality systems where sensory meanings other than 'seeing' and just occasionally 'hearing' never acquire special expression in spoken languages. Unlike evidentials, visual demonstratives hardly ever have epistemic overtones of certainty.

That visibility is not infrequently encoded in demonstrative systems goes hand-in-hand with their nature. Their primarily deictic function is intrinsically linked to personal experience of the speaker and of the hearer, and often involves access to visual information. Evidentials in statements always reflect the information source of the speaker. In contrast, demonstratives with perceptual meanings may combine reference to what can be seen by the speaker, by the hearer or by both.

Modal verbs, particles, parentheticals of various sorts, speech reports and even facial expressions, can be used to express inference, assumption, and attitude to information — whether the event is considered probable, possible or downright unlikely. Over time, any of these can grammaticalize into an evidential (see Aikhenvald 2011a).

Evidential and non-evidential categories may correlate with the type of information, attitude to it, and ways of knowing things in yet another way.

2.3 Type of information, and type of knowledge: the 'mirative' puzzle

Many languages of the world have a grammatical form or construction expressing information which is new or surprising to the 'unprepared mind' of the speaker, or the hearer (DeLancey 2001). This is the essence of 'mirativity'. Some languages employ non-visual evidentials for information of such sort.

The evidential marker -rke- in Mapudungun, an isolate spoken in the Andean areas of Chile and west central Argentina, is a prime example (Smeets 2007: 246-7; 110). In (4), -rke- (with its allomorph -ürke-) (underlined) refers to reported information:
This same evidential form, -rke-, can have a mirative meaning, to do with surprise and new information. If one sees someone one did not expect to see, one can exclaim:

(5) miyaw-pa-rke-ymi
    walk-CISLOCATIVE-NON.FIRSTHAND-2sgINDICATIVE
so you are (around) here! (What a surprise!)

Similar uses of non-firsthand evidentials have been described for many languages of the world (see an overview in Aikhenvald 2006a: 197-209).

Dedicated marking of 'surprise', 'unprepared mind' and unexpected information does not have to part of an evidential system. Hone, a Jukun language, has a special set of 'mirative' pronouns covering this set of meanings (Storch 1999, 2009). Evidentiality, on the one hand, and surprise and 'unprepared mind' on the other hand form independent grammatical systems in !Xun (Köng, this volume) and in Quechua languages (Adelaar, this volume).

A particle ko hà in !Xun marks surprise at something the speaker did not expect (section §3.4 of Chapter 3). The marker can occur in questions and in statements. Unlike evidentials in !Xun which reflect the information source of the speaker, the 'mirative' can also mark the information 'surprising' and 'new' to the addressee. This is especially illustrative in the contexts where the 'mirative’ marks information which is supposed to 'fool' the unexpecting addressee (examples (40) and (43) in Chapter 3).

The 'mirative' in !Xun has yet another, purely discourse-based function: it marks 'the main point of the story' (see (41a-b) of Chapter 3). This usage is remarkably similar to the ways in which evidentials are manipulated to create special discourse effects. For instance, in Abkhaz, a Northeast Caucasian language, crucial and unexpected 'asides' can be cast in the non-firsthand evidential (Chirikba 2003: 317).

The 'mirative' in !Xun can combine with an evidential, and is in a complimentary distribution with the counterexpectation marker kò. The latter is used if something expected fails to take place (§3.5 of Chapter 3). Just like the 'mirative', the counterexpectation marker may reflect the attitude of the speaker, or the hearer, or both. It has strong overtones of an irrealis since it is restricted to situations which did not take place, and can also be used with a deontic ('should' or 'should not') meaning.

A number of Quechuan languages, spoken in the Andean area and especially in the Peruvian Andes, have a special set of verbal forms whose major meaning is surprise, unexpected information and general 'unprepared mind'. These forms are known under a variety of terms, the most frequently used being the 'unexpected discovery tense' (since it can be considered a term in the tense paradigm). Its main meaning is very similar to what is captured by the cover term 'mirative'. Hence the title of Chapter 4, 'A Quechuan mirative?'. Just like in !Xun, 'mirative' is a grammatical system in its own right, and is independent of evidentials and aspects.

The Quechuan 'mirative' cannot be used in negative clauses (in contrast to !Xun). This agrees with a general tendency across the world's languages: that fewer categories are expressed in negative than in positive clauses. In some languages (including Maricopa, a Yuman language), evidentials are not used in negative clauses (see a detailed discussion in Aikhenvald and Dixon 1998). Along similar lines, fewer aspect categories are expected to be used in negative than in
positive clauses. This is also the case in Tarma Quechua, the main focus of Chapter 4, where aspectual distinctions are neutralised under negation (§7).

The meanings of the Quechuan mirative cover surprise, unexpected outcome of an action, and also situations which are out of speaker's control. Actions performed during one's sleep or in a state of unconsciousness are described using mirative. And so are dreams. In many languages of South America, non-firsthand, non-visual or reported evidentials are used in exactly the same function (see Kracke 2010, and summary in Aikhenvald 2012).

The 'mirative' can occur with direct and with reported evidentials. While an evidential refers to the information source, 'mirative' marks the kind of information (unexpected, new or surprising). Just like in !Xun, the mirative can occur in questions, to encourage the addressee to perform an experiment — that is, an action with a yet unknown result (§8 of Chapter 4). The Quechuan mirative can refer to the information that is new and unexpected both to the speaker and to the addressee — again, just like in !Xun. This is in stark contrast with most descriptions of mirative extensions of evidentials (as in (5) above): these almost uniformly reflect just the surprise of the speaker, and not of the addressee.

But are the Quechua 'mirative' and !Xun 'mirative' exponents of cross-linguistically the same category? In !Xun, this category is linked with emotionally loaded exclamations. In Quechua, it is not. Neither does it always reflect the 'unprepared mind' of the speaker. And in !Xun, 'mirative' appears to be in a paradigmatic opposition to a counterexpectation marker. Not so in Quechua.

'Mirativity' as a notion is a relatively recent arrival on the linguistic scene (see DeLancey 2001; and Aikhenvald 2006a: 209-15, for a brief survey). The term has been used to subsume an array of rather different meanings. It is not yet clear whether any marker of new or unexpected information would always qualify as a 'mirative', or whether a 'surprisive' could be identified as a category independent of 'mirative' (as Adelaar, this volume, suggests for Quechua)? The jury is still out.

All we can say with some degree of certainty at the present stage is that !Xun, Quechua, and a few other languages have special means for marking the type of new and unexpected knowledge, different from marking the way in which the knowledge was obtained (that is, from the information source). Contributions like those by König and by Adelaar are crucial in our endeavour to achieve a general perspective on the ways in which languages express information source and information type (new, unexpected, and/or surprising).

2.4 Information source in grammar: an interim summary

Grammatical evidential systems are closed and restricted, with limited choices available. The scope of grammatical evidentials is usually the clause, or the sentence. In contrast, other means of expressing information source offer open-ended options in terms of their semantics, and can be more flexible in their scope. Information acquired through vision, or through firsthand access to it, appears to have a privileged status in the choice of an evidential.

In languages with evidentials, these are never the only means of expressing information source. Verbs, adjectives, adverbials, and speech reports may provide additional detail, to do with attitude to knowledge. We now turn to the lexical expression of perception and cognition.

3 Lexical expression of perception and cognition

Every language has lexical items covering the basic senses — what one sees, what one hears, what one smells, tastes, touches and feels. And there may be an array of lexical devices expressing 'knowledge' and related notions of assumption, inference, opinion, and emotions. Not every language distinguishes the same set of terms. We start with an example.
3.1 'See', 'hear', 'perceive': an illustration

Warekena of Xié, a highly endangered North Arawak language from northwest Amazonia, has
one verb, -eda, covering 'seeing and looking at (something)' and 'hearing and listening'. The verb
is ambitransitive and active (A=S ā). In (6) it means 'see'.\(^{10}\) The verb is underlined.

(6) yariwa nu-sa natina-hā if̦arema neda-hā eni-hi
now 1sg-go 1sg+tell-PAUSAL what/how 1sg+perceive-PAUSAL
kurupira
evil.spirit
now I shall tell how I saw the evil spirit

To refer to 'hearing' something or 'listening to something', one can use the expression -eda
yu∫ana (literally 'perceive voice'), as in (7):

(7) nida yu∫ana utsipie ni-wayata
3pl+perceive voice bird 3pl-speak
they hear the voice of birds singing

The exact reading of -eda is determined by context. In (7), -eda is normally understood as
'hear' or 'listen' — this is what typically happens when birds are around. The expression -eda
yu∫ana can also mean 'understand' (as in benamit∫ nida yu∫ana 'they do not understand anything'
(Ana Paula Baltazar, the oldest living speaker of the language). This same verb can also mean
'reckon, judge', as in (8):

(8) wa-fa weda damari yutsi-ri para-hā
1pl-go 1pl+perceive who strong-ADJECTIVISER run-PAUSAL
let's reckon who is stronger in running

A different verb, -beda, is used with the meaning 'taste' (typically, food):

(9) nu-beda-da-hā mif̦i ura-mia-ri-hī
1sg-try-RED-PAUSAL meat soft-PERF-RELATIVISER-PAUSAL
I am trying the meat (several times) if it is soft (Lit.: meat which is soft).

The verb meaning 'smell (something or someone)' is -∫imeta. It is cognate to a causativised
form of the verb meaning *-kima 'hear, listen, think' in related Arawak languages (Aikhenvald
2002, Appendix 2). None of the verbs referring to perception can be used for cognitive
processes. There is a verb meaning 'think, reason', -puriyuta (whose etymology is unknown). All
the verbs of perception and cognition in this language are active ambitransitive (A=S ā). That is,
the verb 'perceive' cannot mean 'be perceived' (a passive derivation has to be used to express this
meaning).

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\(^{10}\) See discussion in Aikhenvald (1998). All examples are from texts or natural conversations collected with the
Warekena is not unique in using the same verb to express the two major sources of perception, visual and auditory. In Yir Yoront, and Gugu Yalanji (Australian area) the same verbal root is used for 'see, look at; hear, listen' (Evans and Wilkins 2000: 556, Alpher 1991: 61, Hershberger and Hershberger 1982: 135). In another Australian language, Guugu Yimidhirr, the verb *nhaa* means all of 'see, look, hear, think, seem' (Haviland 1989: 29).

In a few other Australian languages, an auditory meaning is rendered by adjunction or incorporation of a noun designating the body part used, as in Djabugay *ngundal* 'see, watch, look at', *bina ngundal* (ear see, watch, look at) 'hear, listen' (Patz 1991).

The form meaning 'see' and 'hear' in Gugu Yalanji and Guugu Yimidhirr may have meant just 'see' at an earlier stage.\(^1^2\) The Warekena form *-eda* is cognate with the verb 'see' in related Arawak languages (e.g. Bare *-yada* 'see, look': Aikhenvald 1995). And in Luwo, the verb 'see, realize' has an additional meaning 'hear, obey' (§2.1 of Chapter 2). This may demonstrate the direction of semantic change, from 'see' to 'hear', but at the same time could be the consequence of in-built polysemy, which in perception verbs is salient in Luwo.

There are examples of semantic development in the opposite direction (contrary to Viberg 1983, 1984, 2001). In Kolyma Yukaghir, a Paleo-Siberian isolate, a construction whose primary meaning is 'auditory' can be used for situations describing visual experience (Maslova 2004).

Synchronically speaking, however, the Warekena verb *-eda* is best treated as a generic verb 'perceive'. Its overtones to do with sight or hearing are typically inferred from the context or disambiguated if required. This is similar to a generic verb of perception and cognition *nN* in Kalam, from the Papuan family (Pawley 1994: 392) (and see §3.2). A generic verb 'perceive' covering several kinds of sensory information is reminiscent of a general 'witnessed' or 'firsthand' evidential term covering any sensory perception (as described for Luwo in Chapter 2, !Xun in Chapter 3, and for Quechuan languages: see Weber 1986, and Chapter 4).

We now turn to a brief overview of recurrent patterns. Before we proceed, some terminological remarks are in order.

### 3.2 How many meanings?

In many languages of the world, verbs 'see' and 'hear' go beyond perception. Sweetser (1990) claims — on the basis on a selection of Indo-European languages — that the verb of visual perception 'see' is a universal source for metaphorical extension to verbs of cognition such as 'think' and 'know'. In an in-depth study of Australian Aboriginal languages, Evans and Wilkins (2000) demonstrated that this does not hold outside the familiar European domain. Verbs of cognition are 'recruited' from verbs referring to auditory perception. García-Ramón (2010) has demonstrated that in ancient Indo-European languages – for instance in the Anatolian family – all possible relations between perception and cognition exist: not only vision and auditory perception, but also touch, smell and taste are documented as sources for 'know'.

As we will see throughout this volume, this is also the case in many languages across Africa and Papua New Guinea. In Manambu, a Ndu language from New Guinea (Chapter 6), the same verb has the meaning of 'hear, listen, think, smell, obey, understand, worry, miss, be sorry about'. In Korowai, an isolate from New Guinea, one lexeme is used to express auditory perception,

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\(^1\) Note similar examples from Gugu Yalanji are in Hershberger and Hershberger (1982: 135) (also see Evans and Wilkins 2000: 556-8 for a few other examples).

\(^2\) The nature of genetic and areal relationships between Australian languages is complicated. In his comprehensive analysis of Australian languages, their nature and development, Dixon (2002) casts doubts onto the viability of Pama-Nyungan versus non-Pama-Nyungan as bona fide genetic groupings. This is the reason why we refrain from using these terms in this chapter.
obedience and knowledge (§3.1.1 of Chapter 5). In Lussese, a Bantu language, the verb *hulirà* means 'hear, listen, feel, and obey' (Chapter 10). In Hausa, from the Chadic branch of Afroasiatic, the verb *ji* means all of 'hear, feel, taste, smell, experience, understand, know, be concerned, be immersed into something, be or become affected, suffice' (Bargery 1951: 497ff).

Each of these lexemes can be considered polysemous. This means that we postulate that each has several distinct albeit related meanings (cf. Lichtenberk 1991). However, not infrequently, different meaning overtones of the same lexeme surface in different grammatical contexts. The verb *wukè* in Manambu means 'listen' as a controlled activity if one of the following conditions apply: (a) its object is marked with locative-accusative case, or (b) the verb is accompanied with a directional, or (c) the verb occurs in the imperative form (see Table 3 in Chapter 6). The same form acquires an uncontrolled meaning of 'hear' if none of these conditions hold.

Different meaning overtones may thus be in complimentary distribution depending on grammatical contexts. This is reminiscent of heterosemy. In a nutshell, the difference between the two is as follows. Polysemy allows us to postulate one lexeme. Heterosemy presupposes the existence of several related lexemes, each surfacing in a different grammatical context.

Suppose a verb in a language refers to a kind of perception ('hear' or 'listen'), to a cognitive process ('think' or 'understand') and to a type of social behaviour ('obey'). Yet the speakers recognise it as one. As Evans and Wilkins (2000: 563) put it, we could be dealing either with an entire semantic system that does not systematically distinguish perception from cognition, or at least some verbs that abstract away from the difference, with the result that we have a vague rather than a polysemous meaning.

In his description of perception and cognition verb *nN* in Kalam (Kalam-Kobon family, Papuan area), Pawley (1994: 392) suggests that this verb has a unitary meaning, merging perception and cognition. As Pawley puts it, in different contexts *nN*, occurring as the lone content verb in a clause, may be glossed as "know, be conscious, be aware, be awake, see, hear, smell, taste, feel, recognise, notice, understand, remember, learn, study.

This fits in with the nature of verbal semantics in Kalam, a language with a small closed class of verbs each with a fairly broad generic meaning. Having a closed or fairly small class of verbs with generic semantics is a feature of numerous Papuan languages (see Pawley 1993 on Kalam; further discussion in Lang 1975 and Aikhenvald 2009: 101-2). What we, as speakers of European languages, would consider an extension of meaning, could be an integral part of meaning itself for a native speaker of a non-European language, such as Kalam or Hausa. This aspect has been constantly brushed aside in Eurocentric discussions of perception and cognition (e.g. Sweetser 1990, Viberg 1983, 1984, 2001): the notions of 'intrafield' and 'transfield' polysemy are applied to any language being discussed without looking at the way meanings are organized in that language. This ad-hoc analytic approach inevitably leads to an oversimplification.

For the purpose of this volume, we will focus on a 'meaning complex' or 'semantic systems' which can be established for each particular lexeme under discussion. This approach may make it largely unnecessary to refer to the notions of 'intrafield polysemy' (e.g. polysemy of the verb -*eda* 'see, look, hear, listen' spanning several meanings within the field of 'perception' in

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13 Defined by Lichtenberk (1991) as a relation in which related, and often identical forms and their different (and related) senses may belong to different grammatical categories, determined morphosyntactically. Some scholars extend the notion of polysemy to include heterosemy (e.g. Lyons 1977).

14 This issue, and the difficulties with distinguishing 'basic' from 'non-basic' meaning, was brought up by Lourens de Vries and R. M. W. Dixon at a local workshop on perception and cognition at Language and culture research group, JCU.
Warekena) and 'transfield polysemy' (e.g. semantic overlap between perception and cognition of the verb *dai/-da-* 'hear, listen, know' in Korowai, Chapter 5). We leave it to individual authors within the present volume to decide whether they follow the 'polysemy' and 'semantic extension' approach, or consider each meaning complex as a holistic semantic system where every overtone has an equal status.

3.3 Verbs of perception and cognition, and their semantic systems

3.3.1 *On typological parameters*

A proper typological study of verbs of perception and cognition is still in its early stages. This is partly so because of researchers' focus on limited samples, and partly so because of difficulties in obtaining fine-grained semantic analyses of semantic systems of languages outside Europe (Australian languages being a notable exception).  

An oft-quoted typological study of lexicalization patterns of perception and cognition verbs by Viberg (1983, 1984, 2001) is limited to just over 50 languages (with hardly any from the Pacific, and South America). Basic distinctions in verbs of perception introduced by Viberg are problematic. In particular, his distinction between Activity-controlled and Experience-controlled perception verbs (such as English *look at* versus *see*) is of limited usefulness. It is indeed the case that some languages have distinct lexemes for both (see Table 5 in Evans and Wilkins 2000: 554). Dongolawi (§3 of Chapter 8, this volume) has different lexemes just for controlled and non-controlled touching. Controlled and non-controlled meanings for *taste*, *hearing* and *sight* involve the same lexeme.

In many languages, however, the meaning of the same verbal form depends on the construction. In Kayardild *marrija* typically means 'hear' in declaratives, and 'listen' in commands (where subject's control is implied: Evans and Wilkins 2000: 554-5). Similar instances are described for Manambu (see §3.2 in Chapter 6), Dongolawi (§3.1.1 of Chapter 8) and Tima (Chapter 9). The overtone of control is a general feature of commands and imperatives (Aikhenvald 2010: 150-3). So, this meaning distinction is what we would expect.

That is, cross-linguistically speaking, the distinction between 'activity' and 'experience' in verbs of perception is often a corollary of the construction in which one single lexeme is used.

Viberg's third type of perception verb is 'source-based copulative (state) construction' from which the perceiver is omitted, as in English *the painting looks old*, *the talk sounds interesting*, or *the daughter's brow felt feverish*. The terminology itself is highly dubious, since the copular status of *look*, *sound* and *feel* in these examples is debatable. Verbs of perception used in such a construction may differ from corresponding transitive verbs with controlled and non-controlled meanings — just as in English *hear*, *listen* and *sound* are different lexemes.

In other cases, a 'source-based copulative construction' is just an instance of an ambitransitive (or labile) verb. The verb *marrija* in Kayardild means 'sound' in constructions like 'I hear that man (as) drunk', that is, that man sounds drunk. In Boumaa Fijian the verb *rogol(-ca)* is an S=O ambitransitive and may mean all of 'hear, listen' and 'be audible' (R. M. W. Dixon, p.c.: Lu 2010, and Chang 2010 provide similar examples from Maonan and Tsou). That is, seemingly different semantics of verbs of perception is a corollary of their transitivity patterns. It would be a worthwhile task to provide a cross-linguistic investigation of transitivity of verbs of perception and cognition (also see questions raised in §3.3.2) as a background to further typological analyses.

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Such 'typically "derived" nature of the source-based set' (as Evans and Wilkins 2000: 555 put it) and the nature of differences between controlled activity and uncontrolled experience in perception verbs invalidates the basic typological parameters Viberg is operating with.

Viberg assumes that if a perception verb in one language may be translated by several verbs into English, we are automatically dealing with a 'polysemy'. As we saw in the previous section, this is an oversimplification. He goes on to claim that 'polysemies' of perception verbs follow a hierarchy whereby 'vision' is the preferred sense. The following universal ordering of means of sensory perception is assumed to determine 'intrafield' extensions of verbs of perception:

Sight > Hearing > Touch > Smell/Taste

A number of exceptions to this unidirectional path were demonstrated in §3.1. Importantly, the 'hierarchy' is based on false parameters of typological variation and on a dubious assumption of intrafield polysemies.

Sweetser (1990) also claims that vision — rather than any other sense — is the only source of 'transfield' extensions from perception to cognition. Her argument in favour of 'vision' as the most important means of sensory perception was criticised by Evans and Wilkins (2000), based on information from Australian languages. Most chapters in this volume point in the same direction.

Within this volume, we limit ourselves to the linguistic expression of five basic senses — sight, hearing, smell, taste and touch.¹⁶ There is no doubt that in many languages of the world perception and cognition are expressed through the same lexical means. Vision, or auditory perception, may be linked to cognition. Or there may be a general verb of 'perception' covering cognitive processes of understanding and thinking. Whether or not we can talk of a diachronic 'development path', from perception to cognition, or whether cognitive and perceptual meanings form one conceptual package, largely depends on the individual language and its semantic organization.

3.3.2 Verbs of perception, and cognition: a special subclass

If a verb can refer to several ways of perceiving or knowing things, how do speakers understand each other? This can be done through pragmatic inference. We saw in §3.1 that in Warekena 'perceiving' a bird is typically associated with hearing it sing, or listening to it, and 'perceiving' an evil spirit means 'seeing' it. Kirsner and Thompson (1976) show that, in English, 'I see that' may mean 'I see (that something is happening)' and 'I understand (that something is happening)', and that the context decides which interpretation is appropriate.

What looks like the same form takes on different overtones in different grammatical frames. Goddard (1994: 237) provides criteria for distinguishing three senses of kulini 'hear, listen; think; heed, listen to, obey' in Yankunytjatjara (also see Evans and Wilkins 2000: 564-6, and §3.2 above). If kulini means 'think', it takes a quotational clausal complement. In its meaning 'hear, listen', kulini takes a nominalized clausal complement. If the meaning 'heed, listen to, obey' is implied, kulini takes a locative clause complement.

All this point towards special grammatical status of perception verbs. In the great majority of languages, verbs are an open word class, with a notable exception of a number of languages in New Guinea (including Kalam: Pawley 1993, 1994). Within this class, verbs of perception,

¹⁶ As did Evans and Wilkins (2000: 555). Note that some of the contributions within this volume make reference to Viberg's 'typology' for lack of any other typological study. We hope that, as new linguistic systems are being described, a new and more comprehensive typology will be worked out.
cognition and sometimes inner states in general (including emotions) may display special grammatical features which set them apart from the rest.\textsuperscript{17}

The choice of a complementizer or a type of complement clause may serve to express meanings related to how one knows a particular fact. In English, different complement clauses distinguish an auditory and a hearsay meaning of the verb hear: saying \textit{I heard John cross the street} implies that I did hear John stamping his feet, while \textit{I heard that John crossed the street} implies a verbal report of the result. A that-clause with perception verbs can refer only to indirect knowledge (see a concise analysis of complement clauses with verbs of perception in English in the context of complementation in general, by Dixon 2005: 270-1). Similar phenomena have been described, by Dixon (1988: 267-79), for Boumaa Fijian.

In Manambu and in Korowai, verbs of perception have special complementation strategies. In both languages, the way of saying 'He saw that his older brother was asleep' is 'He saw, and/while his elder brother was asleep' using a medial clause within a clause chain (§3.2 of Chapter 5 and §2.1 of Chapter 6). In Khwe-\textit{//ani}, perception verbs obligatorily occur in serial verb constructions (Chapter 7). Verbs of perception in Dongolawi (Chapter 8) form serial verb constructions of unusual types. Tables 1 and 3 in Chapter 6 summarize the different grammatical contexts which serve to disambiguate overtones of verbs of visual and auditory perception, cognition and 'trying', tasting and 'experiencing' in Manambu.

Verbs of perception and cognition can display special properties in terms of their argument marking. In a number of Northeast Caucasian and in South Caucasian languages, their subject (the 'Perceiver': see Dixon 2005) is marked with dative case rather than with nominative or ergative case (Onishi 2001); this is a feature they share with verbs of emotions. The case marking of objects of the verbs of perception in Manambu and other languages from the Ndu family helps distinguish their meanings (Chapter 6, this volume).

Perception verbs in Luwo (§2 of Chapter 2) allow the omission of a perfective marker, which is impossible with action verbs. In Lha'\textit{ala}ua, an Austronesian language from Taiwan, if the verb \textit{kita} 'see, look' is used in progressive aspect, it has the controlled meaning 'look' rather than 'see' (Pan forthcoming).

Verbs of perception and also of cognition may be limited in terms of whether they can take derivational affixes. In Tariana, the verb 'see' cannot be passivised or causativised, and can occur in only a few idiomatic symmetrical serial verbs. In Manambu neither 'see, look' nor 'hear, listen' can occur in a full range of compounds (Chapter 6), or be causativised.

In their imperative forms, verbs of perception often lexicalise as discourse markers. The Italian form \textit{Guarda!} 'look!' is frequently used as a means of entitling the speaker to break into a conversation — implying that they have something extremely important to say which requires immediate attention (Waltereit 2002). This form is used in situations when no 'looking', or showing, is asked for — the form has developed into a discourse marker meaning 'I have something to say that justifies an interruption'. A similar pathway could be constructed for English \textit{Look} or \textit{Look here}, Spanish \textit{Mira}, Portuguese \textit{Olha} or \textit{Veja (bem)} 'Look', 'see (well)’, each of these forms is a powerful device of 'floor-seeking' in conversation, and also attention-getting devices and conversation sustainers. Vanhove (2008: 357) describes a similar usage for Wolof \textit{gis} 'you see' used in a 'phatic function, in order to attract attention to a piece of information'. The imperatives of 'see, look', 'hear, listen' and 'know' are often used in Modern Hebrew as attention getters (Malygina 2001: 284). Similar patterns have been described in Turkic languages (Nasilov et al 2001: 215). The erstwhile singular imperative of 'hear' in Russian only survives as a somewhat obsolete attention getter (Aikhenvald 2010: 246-7).

\textsuperscript{17} To be further addressed in Aikhenvald (in progress).
Not infrequently, verbs of perception grammaticalize into exponents of different categories. These include, among others, a passive marker as in French (and perhaps Archaic Chinese: Heine and Kuteva 2002: 270, citing Alain Peyraube, p.c.). A negative existential in Warekena, *beda* (*ba*- ‘impersonal’ + -*eda* ‘perceive, see/hear’) with the negative ya-...-pia) is based on a negated form of ‘perceive’. Verbs of perception may develop into exponents of negative imperative. This is also the case in Warekena:

(10) pida pi-wayata
    2sg+perceive 2sgl-talk/tell
don’t tell (anyone)

A positive or a negative verb of visual perception may express warning, as, for instance, English *look out* and Latin *vide* (Löfstedt 1966: 94). In Tatar, a Turkic language, apprehensive meaning ‘lest’ is expressed through a combination of a main verb (in the form of a converb) and the prohibitive of *kür* ‘see’ (Nasilov et al. 2001: 194-5):

(11) jegýla kür-mä!
    fall.CONVERB 'see'-PROHIBITIVE.2sg
    beware not to fall! (Lit. Don’t see falling!)

In Shor, also Turkic, apprehensive is expressed with a prohibitive form of the verb and the particle *kür* ‘watch out, beware!’, itself a fossilized second person imperative singular of the verb *kür* ‘to see’. Russian has a similar construction, literally, ‘look, don’t *verb* to mean ‘make sure you don’t *verb* (or else something bad may happen)’ (note that this is the only instance where perfective aspect appears in negative imperative in the language). The verb *kita* ‘see, look’ in Lha’alu is used in the meaning of ‘beware’ (in an imperative form) (Pan forthcoming):

(12) k-um-ita-mau likilhi!
    look/see-ACTOR.VOICE-look/see.ACTOR.VOICE.IMPER-STRONG.REQUEST vehicle
    beware of the vehicle(s)!

Verbs of vision frequently grammaticalize into visual evidentials (examples come from Maricopa, a Yuman language, and Shibacha Lisu, from the Tibeto-Burman family: Aikhenvald 2011a: 604-5). A verb meaning ‘hear, listen’ may grammaticalize into a non-visual sensory evidential (this is the case in Wintu, in Shibacha Lisu and in Tariana). In §5, we return to correlations between lexical and grammatical expression of perception.

3.3.3 Semantic systems of perception and cognition: a bird’s eye view

We have seen that in quite a few language the same form may refer to telic and controlled ‘looking’ and atelic uncontrolled ‘seeing’ and ‘noticing’. Another lexeme will refer to ‘listening’ and to ‘hearing’.

The same form can refer to what one ‘sees’ or ‘looks at’, and a variety of other means of perception. We saw in §3.1 above that in Kolyma Yukaghir and in a few Australian languages (mostly from the Cape York Peninsula region) the same form refers to ‘seeing’ and to ‘hearing’. The same form can also be used for cognitive processes, ‘knowing’ and ‘understanding’. Proto-Indo-European *weid-* ‘see’ developed into Greek *eido* ‘see’, perfect *oida* ‘know’, and Latin *video* ‘see’ and Irish *fios* ‘knowledge’, cf. also Dutch *weten*, German *wissen* ‘know’, English *wise*, *wit*, Russian *videt* ‘see’, *vedat* ‘know’ (further discussion and examples are in Ivanov and
Gamkrelidze 1984). This is a typical path for Indo-European languages but is far from universal — cf. §3.2, and criticism of Sweetser (1990) by Evans and Wilkins (2000).

Cognitive overtones (or 'extensions') of verb(s) of vision are not restricted to Indo-European languages. 'See, find' describes understanding and realising something in Luwo ($§2.1$ and $§3$ of Chapter 2), with an additional meaning 'hear, heed, obey'. In Korowai ($§3$ of Chapter 5), the verb i/-imo/-ima- means 'see, look'; its perfective forms mean 'know' (a meaning the verb 'see' shares with the verb 'hear' in this same language).

Along similar lines, in Kasem, a Gur language, vision is associated with 'deep understanding': the verb ña 'see, catch sight, discern, perceive distinctly' also refers to 'understand, realize'. 'Understanding' and 'seeing' or 'looking' are expressed with the same lexeme in Swahili and Wolof, and, albeit marginally, in Beja (Vanhove 2008: 357-8). In Arrernte, the verb itele-areme means 'know, realize, remember, think, understand', and is originally a compound formed from itele 'with the throat' and areme 'see, look for, meet, visit' (Evans and Wilkins 2000: 576, Van Valin and Wilkins 1993: 523-4).

The verb 'see' may also imply 'recognise by vision'; this is the case in Tariana, and Australian languages Mayali and Tyemer (Evans and Wilkins 2000: 575). It may also be used in the sense of 'guard, look after', as in Tani languages (Tibeto-Burman: Post and Modi 2010), Tsou (Chang 2010), Lha'alua (Pan forthcoming: Chapter 10) (where it also has a meaning 'think, have an opinion'). In Warlpiri, 'see' has a sense of judgement and evaluation with state-of-affairs complements (Laughren 1992: 233). In Tima (Chapter 9), the verb of vision also means 'notice, think' and may imply conjecture.

In Tani languages (Tibeto-Burman: Post and Modi 2010), 'see' refers to 'have an opinion, anticipate a result' and 'view a situation in a certain way as a matter of well-assimilated knowledge'. The verb 'see, look' refers to finding out and discovering something (as in Manambu, Chapter 6).

Different verbs of 'seeing' may have different overtones. Lien (2005) discusses three verbs of visual perception in Taiwanese Southern Min. The verb khoann3 covers visual perception and cognition: it means (i) 'watch with eyes'; (ii) 'have a faculty of seeing', (iii) 'guard, tend', (iv) 'read', (v) 'visit', (vi) 'consult', (vii) 'recognise', (viii) 'determine', (ix) 'judge', (x) 'categorize'. The verb kinn3 means 'see', 'meet', 'decide', and siong3 means 'gaze, tell fortunes, wait for'.

The verb of auditory perception covers knowing, understanding and remembering in numerous languages of the world. Meussen (1975: 4-5) suggested this range of meanings as an areal isogloss for sub-Saharan Africa (also see Heine and Leyew 2007, for verbs of visual and auditory perception and their 'cognitive' overtones). This range of meanings is extremely widespread in Australian languages (Evans and Wilkins 2000), Papuan and Austronesian languages of New Guinea, and in Arawak languages of Amazonia (Aikhenvald 2002, Appendix 2). In Luwo ($§2.2$ of Chapter 2) the verb 'hear' may express 'understand'. The verb dai/-da- in Korowai refers to hearing, listening and to knowledge, constituting a compact semantic system where no meaning can be considered 'basic' (in agreement with Pawley 1994). 'Make someone hear' means 'inform' ($§3$ of Chapter 5). In Manambu, wukɔ covers all of 'hear, listen, think, understand, worry, miss someone' and also 'smell' (Chapter 6).

A similar meaning range has been described for Beja and Tswana (Vanhove 2008: 347-50 who provides similar examples from some Indo-European languages). In Tsou, 'hear, listen' may also mean 'remember' and 'understand' (but not 'think'). In Maonan (Tai-Kadai: Lu 2010), 'listen' also means 'feel, intend, expect, guess, suspect'. In numerous languages, 'hear, listen' also means 'obey'.

In many Chadic, Australian and Papuan languages (Chapters 5 and 6, and Pawley 1993), 'hear' and 'listen' can cover other senses including 'feel, touch, smell'. So can the verbs of vision: in Manambu (Chapter 6), it covers 'taste', 'try' and 'experience' in general. The actual meanings
can always be disambiguated by grammatical context. A similar situation appears to hold in other languages of the Ndu family, and in other languages of the same Sepik area, including Karawari (Lower Sepik, Papua New Guinea: Telban 2010).

'Smell' is, not infrequently, expressed with the same lexeme as 'hear'; this is the case in Dongolawi (Chapter 8 of this volume), and Manambu (Chapter 6). In Luwo, 'smell' is associated with the verb 'know', and with 'thinking' (Chapter 2). In Tsou, 'smell' can also mean 'find': the two meanings are differentiated through using different voice markers (Chang 2010). In Nunggubuyu, from the Australian area, =yarra- 'to smell something' can also mean 'to detect, to sense (something)' (Heath 1982: 268). 18 We are not aware of any cognitive overtones of verbs meaning 'taste' or 'touch'.

The verb //ám in Khwe covers taste, touch and smell (§2 of Chapter 7). The verb 'hear' in Khwe refers just to auditory processes, and the verb 'see' in Khwe has no overtones outside vision. However, the cognate form of Khwe 'hear' covers other means of perception — touch, taste and smell — in other Central Khoisan languages (§2 of Chapter 7).

Further meanings of the verb of 'vision' take us into what Evans and Wilkins (2000: 572) refer to as the 'social domain'. We mentioned above that 'see, look' can also cover meanings of 'overseeing, overlooking' and 'guarding' something or someone. 'See' may refer to 'meeting' someone or with someone, for example, in Kasem (Gur: Vanhove 2008: 359), Lussese (Chapter 10), and some Australian languages, including Arrernte, and Kurrajar. In Lha'alua and in Tsou, two related Formosan languages, 'see' is also used in the meaning of 'visiting (someone)' (Chang 2010, Pan forthcoming). Tariana employs a causative of -ka 'see' in the meaning 'meet, encounter'.

A verb of vision may reach into other domains. In Kayardild, kurrjää 'see' covers 'desire, looking upon with lust'. 'See' may have connotations to do with negative emotions and aggressive social acts. In Tyemeri, the auxiliary which on its own means 'see' participates in a number of collocations with clearly negative meanings, including 'be jealous' and 'feel ill at ease' (Evans and Wilkins 2000: 573-4). In Tariana, the verb -ka 'see, observe, find' has an array of meanings to do with negative emotions and attitudes in numerous symmetrical serial verb constructions (e.g. 'be jealous, envious', 'despise', 'mistreat') (Aikhenvald 2001).

The verb of vision may have a further use which has not been extensively discussed in the literature. In Kasem, a Gur language, the verb ña 'see, catch sight, discern, perceive distinctly' also refers to 'understand, realize' and 'find out, win, get (something advantageous, e.g. woman, life, water, crop)'. In Ewe and Likpe (both Kwa), the verb 'see' has the meaning of 'have' (Ameka forthcoming). Another verb that predicates a possessive relation is nyọ 'see':

(13) saka ñ-nyọ a-tááðí
    <name> SUBJECT:CROSS:REFERENCE-see CLASS.MARKER-money
Saka has money

In Ameka's words, this usage 'reflects the idea that what is in one's perceptual domain belongs to them'. Similarly, the verb of vision bona 'see' in Tswana (Bantu) means 'consider, suppose, imagine, recognize (as guilty)', and also 'receive' and 'have' (Vanhove 2008: 359). Correlations between 'seeing' and 'ownership' have so far been found only in African languages.

In Pasighat Adi, a Tibeto-Burman language, 'look' covers possession of a different sort: (14) describes someone possessed by a spirit (Post and Modi 2010):

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18 Also see Evans and Wilkins 2000: 576, for a few further possible instances of cognitive extensions of the root 'smell'.
Verbs of cognition may be associated with domains other than perception, such as ‘take, hold’, and so on. In many languages, verbs of ‘grasping’ extend to ‘understanding’ (see Vanhove 2008: 366): an obvious example is English *grasp* with both meanings.  

We saw above that verbs of perception may refer to cognition and to understanding. It is however incorrect to assume that vision is a universal ‘source’ for expressing cognition (also see Chapter 10). It is also not true that meanings related to cognition always come from reinterpretation of perception (suggested by Viberg 1984; but see a discussion of French *entendre* which developed its meaning of ‘hear’ from the original meaning ‘understand’, and further examples in Vanhove 2008, Evans and Wilkins 2000). In many instances, we are dealing with a general meaning range of generic verbs spanning perception and cognition — in the spirit of Pawley (1994) and Chapters 5 and 6 in this volume (also see Evans and Wilkins 2000: 567-8, for a discussion of Dalabon, Kuninjku and Kriol).

What is so special about ‘hearing’ and its relationship to ‘understanding’? And why is it so that ‘vision’ can acquire negative overtones? This is the topic of §4. We now turn to further ways of talking about senses, understanding and knowing.

### 3.4 Beyond verbs: perception, cognition, and the human body

Meanings to do with perception may be expressed through a special set of terms, not necessarily verb-like. Luwo (§3.1 of Chapter 2) has a highly elaborate vocabulary of terms for smells which form a special word class. Ideophones in Tima (Chapter 9) can disambiguate a general verb of vision (which also has overtones to do with knowledge). Kambaata (Cushitic: Treis 2010) has an extensive set of adjectives referring to different tastes. Formosan languages employ a set of 'lexical prefixes' with meanings of 'seeing' and 'hearing' (Chang 2010, Pan forthcoming).

In most Papuan languages of New Guinea, and also Quechua and Aguaruna in South America, cognitive processes can be rendered through reported speech constructions. This is also a prominent feature of Korowai (§4 of Chapter 5; see Aikhenvald 2011c).

In most languages of the world terms for body parts contribute to the expression of perception, and of cognition. 'Eye' is a universal organ for 'seeing' and 'looking', and 'ear' for 'hearing' and 'listening'. And either 'eye' or 'ear' can be the 'organs' or 'locations' for knowing and understanding.

In his comprehensive study of the semantics of Tibeto-Burman languages, Matisoff (1978: 161) refers to the eyes as 'our highest, most intellectual organ of sense'. Following a similar principle, 'eye' is considered the 'organ' of knowledge in Gbaya 'Bodo (Gbaya-Manza-Ngbaka, 19

This is far from universal. For instance, in Tariana 'reading' is referred to with the same verb as 'playing an instrument'.

20 There is, however, no evidence for a hypothetical development from hearing to vision toprehension (to understanding) (suggested by Vanhove 2008: 368).

It is too early to make any generalizations concerning the meaning complexes oflexemes referring to knowing, understanding, opinions, assumptions and inferences.

21 However, Viberg (1984: 158) also provides a counter-example to this.
Ubangi: Vanhove 2008: 360). This is independent from the meanings of lexical verbs: in Gbaya, the verb 'see, look at' does not mean 'understand' nor 'know'.

'Liver' is considered the seat of emotions, and sometimes also perception in many western Nilotic languages (Storch, own field data) and in neighbouring Bantu languages, such as Lusoga and Luganda (Thanassoula, p.c.). In Gugu Yalanji, an Australian language, jiba-bu nyajil-‘liver/insides-INSTRUMENTAL see/hear/perceive' means 'know without seeing or hearing', e.g. a doctor who knows that a woman will die (Hershberger and Hershberger 1982: 135).

In the overwhelming majority of Australian languages, 'ear' is the locus of understanding, memory, and cognition in general (Evans and Wilkins 2000). In Mangarayi, the "eye" figures as an organ of apprehension, though it does not appear to be intimately linked with the notion of understanding in the way "ear" is' (Merlan 1982: 228).

Along similar lines, 'ear' in Ts'ixa (a Central Khoisan language) is associated with hearing and perhaps also cognitive processes (§2 of Chapter 7). Wa:n 'ear' is the organ of knowledge and understanding in Manambu (Chapter 6). The term 'eye' helps narrow the meaning of the versatile verb 'see' in Manambu to just the meaning of 'seeing' and 'looking': this verb can also mean 'experience, try, taste', but not if accompanied with 'eye'. The 'ear' does not do the same job with the versatile verb 'hear, listen, think, remember, miss, be sorry'. Just like in Australian languages, 'ear' is where hearing, heeding and all sorts of cognition take place. A child, or a person who has not been socialized properly, 'does not hear', or 'has no ear'.

This is similar to Pintupi (an Australian language) where the noun patjaru 'forgettable, disoriented, mad' may also refer to a deaf person; and rama 'angry; emotionally upset; mad person, deaf person' is also 'used of disobedient children' (Hansen and Hansen 1992: 104, 122; Evans and Wilkins 2000: 584). As Myers (1986: 107-8) puts it,

'In the Pintupi view, the concepts "thinking", "understanding" and "hearing" are expressed by a single term, kulninpa, which means literally "to hear". The organ of thought is ear, but emotions take place in the stomach where the spirit is located. To be unaware (patjarru or ramarama), contrastingly, is to have one's "ears closed"'.

'Eye' may have overtones of aggression and sexual desire (similarly to some negative overtones of the verb of vision), as in Kayardild miburuthanda (eye-excessive) 'lecher, big-eye' and ngarrkwa miburlda (strong/hard eye) 'bold, brazen, stern-eyed' (Evans and Wilkins 2000: 566). In Dyirbal, there are two ways of saying 'be jealous' both involving 'eye': 'eye-sit' is typically used by a woman, and 'eye-burn' by a man (R. M. W. Dixon, p.c.). Similarly, in Maonan 'eye' is associated with negative states, e.g. 'eye red' means 'jealous' and 'eye white' means 'hateful' (Lu 2010).

'Ear' can be linked to the expression of emotions rather than of cognition. In Tsou expressions containing the term for 'ear' refer to feelings (such as being sad), intention, and obligation (Chang 2010). In Maonan (Lu 2010), 'ear' is used in expressions associated with reaction to criticism and suggestions: a person with 'sharp ear' is 'receptive' and one with 'thick ear' is stubborn.

Cognition and emotions may 'reside' in other parts of the body. The Korowai of West Papua talk about the inner states from the perspective of invisible thoughts which reside in the innermost parts of a human being ('intestines-gall' or 'guts') (§2.2.1-2 of Chapter 5; also see above, on Pintupi: Myers 1986: 107-8). Among the Manambu of New Guinea, emotions and feelings are located in one's mawul 'inside' (or 'guts'). This notion of 'inside' as the seat for emotions, attitudes and even cognitive states is shared by Karawari, a language from the Lower Sepik family from Papua New Guinea (the notion of wambung 'insides' described by Telban 2010, 1998 is remarkably similar to mawul). In other languages of New Guinea, the 'location' of
emotions may be associated with belly, 'insides' or intestines, and even lungs (see Lindström 2002, Priestley 2002).22

In Arrernte, the verb *itele-areme* means 'know, realize, remember, think, understand', and is originally a compound formed from *ite-le* 'with the throat' and *areme* 'see, look for, meet, visit'. In Arrernte, there are 'good reasons to believe that the element *ite* 'throat' is primarily responsible for the cognition reading of the compound': 'throat' appears in expressions that involve thinking, feeling and so on. (Evans and Wilkins 2000: 576, Van Valin and Wilkins 1993: 523-4).

It appears that the structure and conceptualization of the human body with respect to where cognitive process and emotions are located could be largely independent of the structure and meanings of the verbal lexicon of perception and cognition.

Ideophones are a special word class in many languages. In Luwo ideophones refer almost exclusively to 'vision'; this may be due to their prominence in oral narratives. In his study of Siwu, a Kwa language, Dingemanse (2011) shows that ideophones may code perception, inner states of emotion and socio-cultural intentions. He suggests that if a language has ideophones referring to smells and tastes, it will also have ideophones referring to vision and hearing. If confirmed, this would suggest an intrinsic hierarchy of mapping senses onto ideophones. The issue requires further investigation.23

The 'eye' and the 'ear' and their many overtones correlate with some aspects of culture, behaviour and socialization in numerous non-European societies.

### 4 Perception and Cognition in Their Social Contexts

In many Australian Aboriginal societies, visual and auditory perception have different social statuses. Evans and Wilkins (2000) stress the importance of hearing, listening and 'heeding' in Aboriginal social interaction. Here, eye-contact is communicatively loaded and may be considered part of aggressive behaviour. It may imply sexual advances and even negative emotions. In their dictionary of an Australian language Pintupi, Hansen and Hansen (1992: 91) remark:

'the norm is for limited eye contact in conversations and addressing larger gatherings; prolonged eye contact which is the European norm can be offensive, implying that you don't trust or recognise the person; prolonged eye contact with the opposite sex, can be interpreted as a sexual advance'.

Similar processes of socialization through heeding and hearing have been described for a variety of societies in Papua New Guinea (including the Manambu, by Harrison 1990, cf. Aikhenvald 2008, and the Gapun, by Kulick 1992). 'Eyeing' and 'looking' in general have negative overtones as intrusive and aggressive. Negative overtones of verbs of seeing and of the term 'eye' appear to be connected with these (see §3.3.3 and §3.4 above).

Focus on 'hearing' and on 'seeing' could be associated with different styles of communication and interaction. The 'Anglo white middle class' conversational style is believed to involve eye contact, and people facing each other. The speaker is in control. In remote Aboriginal communities, eye contact is not important, and partners in conversation do not face each other. The hearer, not the speaker, is in control (Evans and Wilkins 2000: 582). Communicative load is distributed differently across different senses. 'Seeing' is not emphasized as 'giving understanding or knowledge'.

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22 This may suggest the conceptualization of the human body as a 'container' or a space with visible and invisible components playing different roles in the expression of feelings, emotions and understanding.

23 Mohr (forthcoming) argues that mouthings in Sign Languages have similar meanings and functions.
Numerous societies in South America and in New Guinea share a further feature. Many taboos are associated with 'vision' (and none with hearing). For example, women are not allowed to catch a glimpse of sacred flutes, among the Manambu of the East Sepik, and among numerous groups in Lowland Amazonia. Just like in many Australian Aboriginal societies, in-law relatives are not allowed to look at each other among the Tariana and their neighbours, and also among the groups of the Xingu area (who also employ a special avoidance style to speak to in-law relatives: Aikhenvald 2012 contains references).

The Manambu have further taboos associated with 'seeing' something (and none to do with 'hearing') (§3 of Chapter 6). All taboos we are aware of are to do with women or uninitiated men seeing something they are not entitled to. This would make them blind, or kill them.

Being able to 'see' what others do not see is associated with power, in the same spirit as the power of the 'invisible' discussed by Storch (2010). Powerful beings 'see us' but 'we cannot see them', in Manambu lore. This power of being able to see is echoed by the abilities of north-west Amazonian shamans to 'see' what is hidden to others. While a normal person cannot 'see' the most dangerous evil spirits and can only 'feel' them, a shaman 'sees' them all. An ordinary human would use the non-visual evidential in talking about their dreams, while a shaman has the authority to use the visual evidential. In many Lowland Amazonian societies, special supernatural powers can be obtained by using hallucinogenous drugs and then getting to 'see things'. Seeing is powerful, and also dangerous. A person who does not know how to handle the shamanic visions appropriately will die.\(^\text{24}\)

This special position of 'vision' as a powerful but dangerous sense provides motivation for preferential status of hearing, listening and heeding in day-to-day socialization.

During her intensive immersion fieldwork among the Manambu, one of the authors of this chapter observed the importance of oral education and listening to what is being said. However, in contrast to remote Aboriginal communities in Australia, the Manambu are not averse to eye contact, and do not consider facing each other particularly threatening or inappropriate. The exact techniques of interactions among the Manambu appear to be different from those in Aboriginal societies. Yet the semantic space of the verb 'hear' and the role of 'ear' as the locus of knowledge are very similar.

Smells may be more important in some languages and cultures than they are in others. Luwo (§3.1 of Chapter 2) has a highly elaborate vocabulary of terms for smells which form a special word class. Numerous terms for 'tastes' are verbs. Highly developed vocabularies for smell and taste terms are a feature of other Western Nilotic languages. Smell terminologies in some of them describe natural and supernatural phenomena, and in all probability reflect the worldview of the people, who categorize referents according to their smell.

Languages vary as to how rich they are in terminologies for taste. Languages of the Guĩ-Gana cluster (Central Khoisan) have an elaborate set of verbs referring to tastes. Khwe (§2.3 of Chapter 7) has quite a few verbs and numerous expressives to do with texture and taste of food.

An additional and perhaps important point about a typological study of semantic fields is how to encompass all the relevant distinctions without excessive simplification. So far we have limited our discussion to just the five senses considered 'basic'. But individual languages may be able to express more.

For example, Evans and Wilkins (2000: 554) mention another sense pervasive in Australian languages. They call it 'proprioception', or internal feeling as opposed to external touch, as in Arrernte welheme 'feel (cold, sick, hot) and so on, feel something doing something to you'. This verb is distinct from anpeme 'touch, feel by touch (rough, smooth, etc)'. Historically welheme comes from a reflexive form of the verb 'hear'.

\(^{24}\) We are grateful to Robin Rodd for these insights.
Tariana has a verb -rena 'feel a general internal state, be in a good or bad state', distinct from -hima or its causative -himeta meaning 'feel cold, sick, hot, someone touching you'. And in Khwe (§3.2.3 of Chapter 7) the verb with a general meaning 'perceive' enters in a serial verb construction with a verb 'know', creating the meaning knowing via divination. We need many more studies before we can create a valid typology of senses and their linguistic expression.

'Knowledge' itself is not a unitary concept. Many West and Central African societies distinguish 'volitional' cognition and 'non-agentive' knowledge. Volitional cognition implies that a person is deliberately searching for information, or for truth — for example, by traveling, by visiting people, by consulting an oracle or by reading a book. Non-agentive knowledge implies something that comes to a person without them deliberately seeking it: this often involves spirit possession and knowledge obtained through supernatural means. This type of knowledge is often associated with the use of specific registers — such as spirit languages (Storch 2011).

Initiates to the Yeve secret society and cult in Ghana and Togo go through a period of education which may last up to three years. They learn the spirit (or cult) language Yevegbe and speak it whenever they are possessed, or take part in Yeve rituals. In this religious register of Ewe (the main language of the people), some ambiguous terms are disambiguated. For instance, Ewe has one word for 'tomorrow' and 'yesterday', and Yevegbe has two:

(15) Ewe   Yevegbe
    etsɔ   etre
    'yesterday'
    'tomorrow'

Or one term can be used where the ordinary Ewe uses two. Ewe has a verb meaning 'teach' and another one meaning 'learn'. Yevegbe has one covering both meanings (Akuetey 1998/99):

(16) Ewe   Yevegbe
    fia nu 'teach'
    srõ nu 'learn'

    yaktɔni wɔ

We hypothesise that volitional knowledge could be equated with other agentive, or volitional, actions. These culturally distinct types of 'knowledge', their agentivity and acquisition, are a matter for future studies.

5 PERCEPTION AND COGNITION IN GRAMMAR AND IN LEXICON: WHAT CAN WE CONCLUDE?

Every language has lexical means for expressing information source, perception and ways of knowing things. Information source is grammaticalized as evidentiality in only about a quarter of the world's languages. A closed grammatical system is bound to offer restricted options. This is in contrast to the lexicon where the choices are more abundant. We find more fine-tuned expressions in the lexicon of perception and cognition than in the corresponding grammatical systems. Yet one can trace a common thread.

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25 The exact geographical distribution of evidentials remains a matter for further studies. Aikhenvald (2006a, b) provides the most up-to-date picture based on all available sources (over 500 grammars) (criticism of approaches based on limited 'samples' are in Aikhenvald 2011c). Very few evidential systems have so far been described in African languages. However, as African linguistics is developing, many more systems are coming to light: see Chapters 2 and 3 in this volume, and Aladin, Schneider-Blum and Dimmendaal (forthcoming).
In some languages vision is associated with cognition. There, the eye can be considered the 'highest, most intellectual organ of sense' (Matisoff 1978: 161). In others (spoken mostly outside the familiar Indo-European domain), 'ear' and auditory perception is associated with cognitive processes of understanding, knowing and remembering. Vision appears to be treated as a rather special way of accessing information. It tends to be linked to special access to power. It may be interpreted as aggressive, dangerous and associated with superiority and dominance, which is not viewed as commendable in essentially egalitarian societies — such as Australian, Papuan, Amazonian, and Central Khoisan. This provides a cultural background for the 'ear', not the 'eye' as the foremost 'intellectual organ'.

We hypothesize that vision is important and special, hence its potentially dangerous connotations. In contrast, hearing and listening are, in many societies outside Europe, much less intrusive. This type of perception — as the functionally unmarked choice — tends to merge with understanding, knowing and remembering, and with other means of sensual perception, including smell and touch.

A similar principle is reflected in the semantics and usage of evidentials. In many evidential systems, vision is a privileged source of information (see §2.1.3). In a fair number of societies, visually obtained ('seen') information is the most valuable sort (see Hardman 1986 on Aymara). At the same time, visual and firsthand evidentials, and verbs of vision, are to be used with caution: only a person who has 'seen' has the right to say 'I have seen'. This goes together with the privileged, and somewhat feared, status of vision in many lexical expressions. In some evidential systems, visual and firsthand evidentials are associated with responsibility and certainty. This is not the case for non-visual and non-firsthand terms.

A close link between lexical verbs and grammatical evidentials is reflected in their metalinguistic uses. In a number of languages with evidentials, an evidential can be rephrased and reinforced with a corresponding lexical verb (Aikhenvald 2006a: 340). In Tariana, a visual evidential can be strengthened with the expression 'I saw this-visual' if the audience appears to be incredulous. Similar examples have been attested in Latundê-Lakondê, a Nambiquara language (see Aikhenvald 2012). Lexical verbs can be employed in metalinguistic comment on evidential use (with 'see' for visual evidential, 'hear, feel' for 'non-visual evidential' and 'tell' for reported evidential). However, the possibilities within a grammar are restricted compared to what we may find in the lexicon.

All languages have ways of talking about smell and taste. However, these meanings never seem to be grammaticalised as evidentials in spoken languages. A non-visual evidential hardly ever refers to information acquired through 'hearing' something. Neither hearing nor smell nor taste appear to be grammaticalised in other areas of linguistic structures: for instance, our cross-linguistic study of classifiers reveals that these parameters never surface in any classifier type (Aikhenvald 2000), or in any other verbal or nominal category.

Different cultures evolve different systems of socialization. For some, 'hearing', 'tasting' or 'smelling' are more central for some than for others (along the line of argument in Storch 2004). For others, vision is 'on top'. One is tempted to hypothesize that the aggressive, hierarchical and self-centred character of many Indo-European cultures and societies — reconstructed as far back as Proto-Indo-European by Ivanov and Gamkrelidze (1984) — would correlate with a strong preference for potentially dangerous 'vision' as a major avenue of cognition.

Egalitarian and consensus-based cultures — such as Amazonian, Australian and Khoisan — appear to avoid the intrusive 'eye' and stick to a less marked and less intrusive perception complex, with hearing 'on top'. At present, this generalization remains tentative. Providing a one-to-one correlation between grammar, lexicon and culture is never an easy exercise.
One thing is clear at our present state of knowledge: no 'hierarchy' of senses is universal. In the light of their distinct overtones across continents and cultures, sight, touch, hearing and smell may each be primary, and preferential, albeit in different circumstances and in distinct ways.

6 HOW THIS VOLUME IS ORGANISED

This volume is based on a three day International Workshop 'Perception and cognition', conducted by the editors in November 2010 at the Institute für Afrikanistik, University of Cologne, sponsored by the preparatory initiative for the CRC 'Migration of ideas', University of Cologne. A shortened version of the current chapter and a checklist of points to address were circulated to the invited participants, so as to make the volume uniform.

Our aim here is to present a typological, empirically based account of ways of expressing meanings to do with perception and cognition in a selection of languages. In every language, the field of perception and cognition is substantial. We have allowed each author to choose the most interesting aspect of this field relevant to the language they are analysing. We also endeavour to cover a variety of issues relevant for the expression of perception and cognition in the language as a whole, its grammar and its lexicon, so as to give the reader an idea of the potential wealth in this domain, cross-linguistically speaking.

The chapters in the volume divide into two groups — those dealing primarily with grammatical expression of perception and knowledge, and those dealing with lexical expression of these same concepts.

Chapter 2, 'Knowing, smelling and telling tales in Luwo', by Anne Storch, deals with grammatical and lexical ways of expressing perception and knowledge. The author discusses a small evidential system in Luwo which is limited to just perfective aspect. This type of system is widespread cross-linguistically, but is a rarity on the African linguistic scene. The rest of the chapter focuses on the expression of perception and knowledge in Luwo. There is an especially rich array of lexemes expressing smells and tastes of various kinds, and a special word class of ideophones which almost exclusively express vision. This is linked to the ways in which knowledge is transmitted, and what is important to the Luwo in terms of their social and cultural environment.

Chapters 3 and 4 focus entirely on grammatical expression of information source and concomitant attitude to information, with a special focus on what has come to be known as 'mirativity'. Chapter 3, 'Source of information and unexpected information in !Xun — evidential, mirative and counterexpectation markers', by Christa König, starts with an analysis of a two-term evidential system in this Central Khoisan language. !Xun distinguishes firsthand and non-firsthand information. In addition to this, it has a special mirative morpheme. This marks information which is surprising or unexpected to the speaker, or hearer. A marker of counterexpectation is in paradigmatic opposition with the mirative; it has deontic overtones, emphasising the fact that the speaker disapproves of a piece of 'unexpected' information.

Chapter 4 'A Quechuan mirative?', by Willem Adelaar, presents a comprehensive analysis of a category known as 'sudden discovery tense' in a number of Quechuan languages of the Andean area in South America, with a focus on the category in Tarma Quechua. In its meaning, 'sudden discovery tense' is akin to mirative: it refers to unexpected events and new information. This coexists with a three-term evidentiality system (direct evidential, with strong overtones of certainty, conjectural evidential, and reported evidential). But does the Quechuan 'sudden discovery tense' fit in with the current definitions of mirativity? Or is this an exponent of a different grammatical category?

The meanings and the semantic width (or 'polysemous patterns') for each form are the focus of most chapters within this volume. Chapter 5, 'Seeing, hearing and thinking in Korowai, a
language of West Papua', by Lourens de Vries, investigates perception and cognition expressed through verbs of seeing, hearing and thinking in Korowai, a non-Austronesian language. The author discusses grammatical constructions involved in the expression of perception and cognition in Korowai within the context of ‘distributive’, ‘thematizing’ and ‘quotative’ patterns typical for New Guinea as a linguistic area. Korowai speakers make a distinction between talking about inner states from the inside perspective and from the outside perspective, which involves visible and audible actional manifestations of inner states. They employ speech reports to represent the ‘inner’ conversation that takes place in the ‘guts’ of people.

Chapter 6, 'Perception and cognition in Manambu, a Papuan language from New Guinea', by Alexandra Y. Aikhenvald, also focuses on the expression of perception and cognition in another non-Austronesian language of New Guinea, spoken in the Sepik area. In many languages of the world, verbs and other expressions associated with perception and cognition form a special subclass in terms of their grammatical features. Verbs of perception in Manambu share a number of grammatical features, which justify considering them as a special subclass of verbs. The verb referring to visual perception also means ‘experience’, ‘try’, and ‘taste’. The verb referring to auditory perception also means 'obey', 'understand', 'remember', 'miss', 'be sorry for'. Overtones of these verbs can be distinguished by grammatical contexts. These include argument marking, the use of directionals, and occurrence in imperative constructions. The chapter addresses the ambivalent role of visual perception in Manambu cultural practices.

Chapter 7, 'From body to knowledge: perception and cognition in Khwe-||Ani (Central Khoisan)', by Matthias Brenzinger and Anne-Marie Fehn, focuses on the semantics of lexical verbs of perception and cognition in this previously poorly-known Khoisan language, with special focus on the core perception verbs mu/u)~, kóm! and /âm may cover the entire range from bodily perception to cognition, covering understanding and knowledge. In their cognitive meanings, the three verbs tend to be used in serial verb constructions linked to the verb ă!/‘know’. The semantic domains of perception and cognition in Khwe reflect the speakers’ understanding of the world, i.e. are based on their belief systems and other cultural traditions. What can be shown for Khwe seems to hold true also for other Central Khoisan speech communities, including Ts’ixa, a previously undescribed language spoken in northeastern Botswana.

Chapter 8, 'Perception verbs and their semantics in Dongolawi (Nile Nubian)', by Angelika Jakobi and El-Shafie El-Guzuuli, focuses on lexical verbs of perception and cognition and their meaning overtones in this poorly-described language. Verbs of vision and of auditory perception develop meanings beyond perception proper. The verb of vision covers 'inquisitive cognition' (examining, checking and 'finding out'), and social interaction (greeting, meeting, visiting, guarding and protecting). The auditory verb has the meaning of 'accept advice' and 'obey'.

Chapter 9, 'Excite your senses — glances into the field of perception and cognition in Tima', by Gertrude Schneider-Blum and Gerrit J. Dimmendaal, focuses on the lexical expression of perception and cognition in this highly synthetic Tima-Katla language spoken in the Nuba Mountains of Sudan. Verbs of perception and cognition do not form a special subclass. The verb 'see' has an array of meaning extending into the domain of cognition and social interaction, while 'hearing' is associated with 'heeding' and 'obeying'.

Chapter 10, 'Perception in Lussese', by Marilena Thanassoulou, addresses the expression of perception and cognition in this endangered Bantu language from Uganda. The author argues that the use of terms referring to the body and the physical senses reflect cultural categories rather than universal principles. A number of metaphoric meanings are associated with the verbs of vision in Lussese. Colour terms in this language constitute a special subclass of adjectives, and are particularly rich. The author focuses on the semantics and cultural implications of
colours in Lussese and their significance for the way in which the sense of vision is conceptualised.

All chapters in this volume are cast in terms of the fundamental typological theoretical apparatus 'that underlies all work in describing languages and formulating universals about the nature of human language', where 'justification must be given for every piece of analysis, with a full train of argumentation'.

The categories and their properties are explained inductively — based on facts, not assumptions. As Bloomfield (1933: 20), put it: 'The only useful generalisations about language are inductive generalisations. Features which we think ought to be universal may be absent from the very next language that becomes accessible... The fact that some features are, at any rate, widespread, is worthy of notice and calls for an explanation. When we have adequate data about more languages, we shall have to return to the problem of general grammar and to explain these similarities and divergences, but this study, when it comes, will not be speculative but inductive.'

This volume is not intended as a comprehensive typology of perceptual meanings in the world's languages. The time is not yet ripe for this: we need many more in-depth studies, to understand the ways in which languages of the world express what is perceived and what is known or understood. The volume consists of nine contributions, each focusing on one language, and testing some of the hypotheses offered in this introductory chapter. Many more studies of this sort are needed before we can offer a reliable comprehensive typology of lexical means of expressing perception and cognition. Let this be a fruitful start.

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26 See Dixon (1997: 132); see also Dixon (2010).


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