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LANGUAGE OF PERCEPTION: THE VIEW FROM LANGUAGE AND CULTURE

Stephen C. Levinson, Asifa Majid & N. J. Enfield

Project: Categories and concepts across language and cognition
Task: Elicitation task for language of perception
Goal: Collect basic linguistic data about the language of perception, as a complement to stimulus-based tasks

Background

This entry provides an overview of some linguistic phenomena pertinent to the "language of perception", and is a necessary companion to the elicitation tasks later in the field manual. To provide a thorough overview of the language of perception in any language is a very big task – take a look at Miller & Johnson-Laird (1976) to get an impression! But a relatively quick, if approximate, overview can be obtained without too much work if you attend to the dimensions in these notes.

The stimuli presume the coherence of specific domains, like vision vs. olfaction, but it is interesting to see how the language itself carves the perceptual world. These notes are aimed at helping you see patterns in the language itself, which may form categories across some of the stimuli domains which you won't pick up directly from running the stimulus materials. There are for example consistent ethnographic reports of sensory classifications which are cross-modal, e.g. combining desiccation/succulence with color, surface reflective properties with color, or pattern distribution with color (cf. English *piebald*, *skewbald,* etc., for horses). There may even be whole word classes like expressives or ideophones specialized for these kinds of cross-modal or multidimensional categories. Stimuli that purposefully strip out cross-modal information may fail to elicit any such terms.

Therefore, independently of the stimuli tasks, it is crucial to establish how the borders and boundaries between the senses are handled in order to provide a fuller interpretation of the results from those tasks. Note too that the subproject on sensory coding is interested in finding "ineffables" – domains or subdomains where linguistic coding is absent, restricted or coarse. It thus relies crucially on *negative evidence* – the noted absence of full, differentiated lexical coverage of certain semantic fields. How can one be sure that the elicitation has properly probed the areas in question?

The stimuli in this Field Manual will certainly help you feel confident that you have explored the various subdomains, but there will always be the nagging suspicion that decontextualized stimuli have failed to evoke responses that would be used in more natural discussions about sensations in the surrounding environment. It is therefore important to make systematic notes, with the help of your best consultants, on purely verbal explorations of these domains. Set yourself up a Toolbox file of Lexicon type (call it e.g. Senses) handy for making notes under Smell, Color, etc., so that as you come across expressions in texts you make a note. This way you will rapidly acquire a basis for further elicitation. Headings should include Color, Shape, Touch, Sound, Smell, Taste, Emotion and Cross-modal Categories. It will be worthwhile entering ethnographic information under these same headings too (see the notes in Part II).

Part I: Exploring the language of perception

A. Elicitation hints on parts of speech

Perceptual terms are likely to be coded in verbs, nouns and, if the language has them, adjectives. Of course it is of some interest where a semantic domain, such as color, is covered by a mix of e.g. nouns and verbs, or nouns and adjectives. This is not an uncommon pattern.

Perceptual categories may also occur in other form classes, either directly (i.e. referring terms with perceptual categories as extensions) or indirectly (as form classes that presuppose perceptual categories). For example, expressives may denote perceptual events, while demonstratives, classifiers or positional verbs may indirectly classify percepts while denoting other things. We are primarily interested in direct categorization of sensory/perceptual experiences, but indirect classification may provide useful ancillary evidence (see field manual entry by Tufvesson on expressives).

These notes are organized under form-class rubrics. Often of course the words in question may be derived (e.g. adjectives from verbal or nominal roots), in which case one must track back to the source lexeme, and try to understand its meaning and use too.

i. Verbs

The basic reference here is Viberg (1984, see also Evans & Wilkins 2000), who explored the conflations of verb meanings across different senses. He distinguished between intentional, controlled activities (verbs like *look, listen*), non-controlled, automatic processes he called experiences (like *see, hear*), and copulative verbs where the source emitter is subject (like *sounds* in *the bird sounds like this*). His analysis for English looks like this (we have expanded his analysis so that cells are filled in):

English	Activity Experience		Copulative (Source = S)
SEE	*look at*	*see*	*(it) looks*
HEAR	*listen to*	*hear*	*(it) sounds*
TOUCH	*feel*$_3$	*feel*$_1$	*(it) feels*$_2$
TASTE	*taste*$_3$	*taste*$_1$	*(it) tastes*$_2$
SMELL	*smell*$_3$	*smell*$_1$	*(it) smells*$_2$

Table 1: English verbs of perception

Many languages conflate perceptual categories – for example Table 2 shows the conflations in Luo with the verb 'hear' covering touch, and with modification, taste and smell too.

Luo	Activity Experience		Copulative (Source = S)
SEE			
HEAR	*winjo*	*winjo*	
TOUCH		*winjo*	
TASTE		*winjo ndadu*	
SMELL		*winjo tik*	

Table 2: Luo verbs of perception

Viberg showed that conflations seemed to be directional from some senses to others. Figure 1, derived from around 50 languages, depicts these tendencies. The directionality of the arrows he obtained largely from frequency of conflations, and the traces of extension as shown, for example, by modifiers (as in Swedish *känna* 'touch', *känna smakken*, lit. 'touch taste' i.e. taste – see also Luo extensions of 'hear' to 'taste' and 'smell' above).

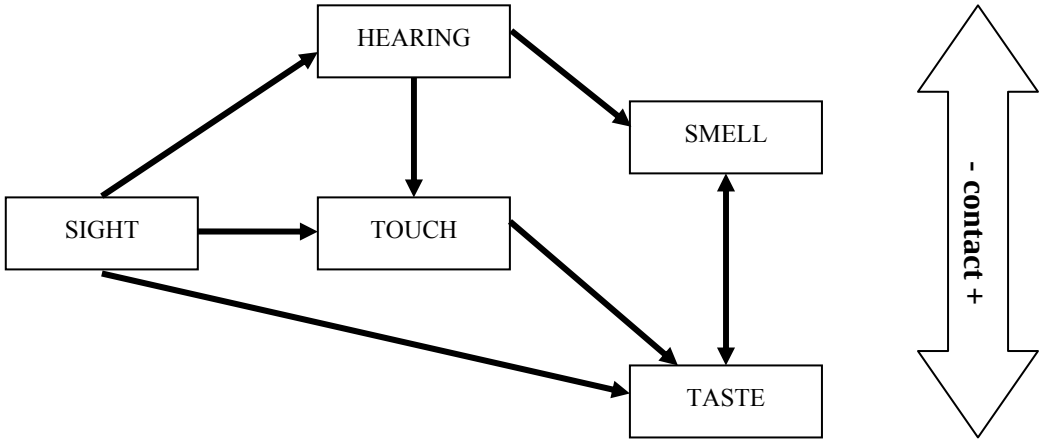

Figure 1: Patterns of conflations across the senses shown across languages

So, begin by filling in a Viberg table. But note, Viberg's categories of verb (activities, experiences, copulatives) may not be sufficient. Roughly, Viberg's activities often map onto the Vendler class of the same name (unbounded events with change), while experiences often map onto Vendler's 'achievements' (bounded events with no internal time course) – but the Aktionsarten of these verbs is actually controversial (see e.g. van Voorst 1992). So you need to think both about verbal aspect and the semantics of control by the subject of the process – if you *listen* you have to attend, but you can *hear* without *listening*. This distinguishes between *look* and *see*, but you will need also to attend to the argument structure to understand the difference between, e.g., *watch* and *look* (i.e. *watch X* vs. *look AT X*; note also that these verbs have special valency structure in English; omission of an object argument as in *John is watching* presupposes identifiability of the omitted argument, unlike say *John is eating*).

When eliciting this material, and checking your dictionary and texts, you need to check the boundaries of what you think is the main sense of the verb. Viberg found numerous extensions from the experience verbs only, and within experience verbs numerous conflations of {Taste, Smell, Touch} and {Hear, Taste, Smell, Touch}.

In trying to decide the significance of a conflation pattern (is it a change in progress, or is it a cultural *leitmotiv*?) it is essential to have at hand both further linguistic facts and cultural facts. For example, the Rossel experience verb for 'hear' is the same as for 'smell'. So what? But it also turns out that there are other such conflations in the lexicon, for example, *kîgh:ê* 'make a strong noise, OR make a strong smell'! This suggests something more systematic, namely a regular conflation of non-visual sense-data where experiencer and source are distant in space or not in contact. Conflations appearing in other semiotic systems, such as co-speech gesture, auxiliary sign language, art, mythology, song, idioms (see Evans & Wilkins 2000) may also provide evidence for a cultural *leitmotiv*.

A final point: grammarians have long noted that *verba sentiendi* are likely to be coded in special ways. They may take special kinds of complement, or a wider range of complements (as in Latin), or they may encode the experiencer as a 'dative subject', or in a special 'experiencer' case. Note for example the following patterns: *Ramu liked the food* (experiencer as subject), *The food pleased Ramu* (experiencer as accusative), *The food appealed to Ramu* (experiencer as dative or oblique) – the verbs take different case frames. Our guess, based on a handful of languages, is that there is a hierarchy of the sort SEE > HEAR > TOUCH > SMELL > TASTE, so that dative subject experiencers (and possibly other special syntax) are more likely to be found rightwards. So don't forget to observe how the different sensory verbs pattern in syntactic frames, and what role these frames have in the grammar more generally.

ii. Nominals

In English, and other languages, there are ordinary (non-Latinate, non-expert) nouns denoting whole sensory fields, like *sight, touch*, *sound, smell, taste* – historically all deverbal (in addition there are of course the Latinate *vision*, *olfaction*, etc.). You need to check the extensions of all these, if you have them. In addition, there may well be nouns for well-defined subdomains, like *color, shape, size, texture,* etc., which themselves act as superordinate terms for semantic fields. However, in many field languages no such words will be in evidence, but you need to check for them of course, because it will make the instructions for the stimulus based experiments a lot easier (*What kind of color/sound/smell is this?)*. At a lower taxonomic level, then, we may find specific words or phrases for kinds of noises (*bang, ring, roar,* etc.), colors, smells (*stink*, *stench, fragrance*), etc.

Across all fields, one can expect the use of nouns to denote percepts on the basis that their referents are exemplar sources – thus the names for objects can denote colors (*orange, turquoise*), smells (*gas, musk*), tastes (*salt, garlic*), or sounds (*whistle*), etc. Historically, this will be the source for many perceptual terms – something worth checking is whether the exemplar still pulls the prototype away from what may be perceptually the most salient focus (as in Yélî *wuluwulu* a term broadly denoting red, but with the focal color held to brown by its shell exemplar). In the case of the more ineffable domains, one may expect the extensions of some of the relevant nouns to be vague and ill-defined, something that should show up in our stimulus naming tasks. For example, it is notorious that 'sour' and 'bitter' extensions are often confused.

It is not at all unexpected to find conflations over the senses in nouns, just as in verbs. For example, Rossel *n:uu* 'taste' also extends to 'experience in any modality'. It is interesting

to note just which of the sensory fields is and isn't covered by a nominal, and what the uses of that nominal are. For example, although English provides *sight* for the visual field, it does not have the full functions that *smell* and *sound* have: One can ask 'What kind of sound/smell?' but colloquially 'What kind of sight?'. In fact a reasonable guess (in the apparent absence of any literature on this) is that there's a lexicalization hierarchy that runs partly in reverse to the Viberg scale for verbs (Figure 2).

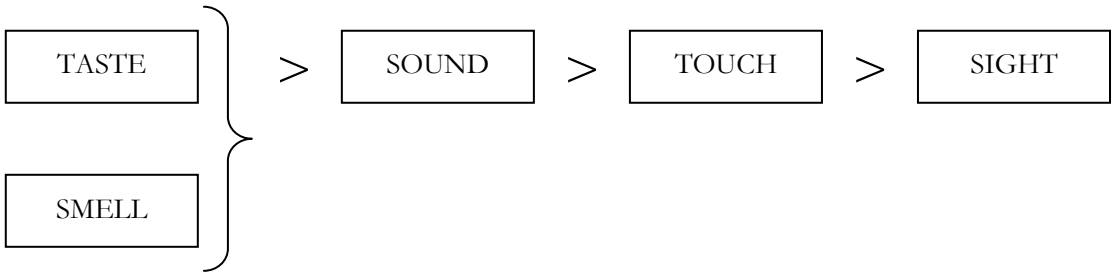

Figure 2: Lexical hierarchy for nominals

Nominals obviously can be modified, and a lot of the responses to the stimuli materials are likely to be of the kind 'a bad smell', 'a horrible noise', etc., - see Adjectives below. A thing to check here, though, under nominals is whether there are fixed collocations which are in effect compound nouns (cf. *ultramarine blue*). For example, Lao has nominals *kin1* 'odor, smell (of something)', *lot1-saat4* 'flavor, taste (of something)' (from Sanskrit *rasa-jāti*), and *siang3* 'sound, voice (of something)', but interestingly nothing corresponding to touch or sight.

Rossel also has predicate nominals, a special class of nouns which take an experiencer as possessive and a source as subject, as in 'grasshopper (in) my visual experience' (meaning 'I have experienced that kind of grasshopper visually', *nt:anê* 'experience by hearsay' or 'experience by smell' (note the conflation!), *ngópu* 'visual experience', *kpêê* 'direct experience in any modality' and so forth. These are semantically close to evidentials, which are also likely to make modality-of-evidence distinctions (see below).

iii. Adjectives and modifiers

Not all languages have adjectives, but arguably all have adverb-like concepts, namely property predications, often coded as verbs. For languages with a clear adjective class, many terms relevant to different perceptual domains are likely to occur in that class, although they may be derived adjectives rather than non-derived ones. Yélî Dnye for example reduplicates nouns to form adjectives, and the (few, arguable) color words in the language are of this type ('red.parrot-red.parrot' = red, etc.), along with the terms for specific tastes like *nj:eenj:ee* 'sweet/salty' (formed from the noun for sea-water). This is interesting of course, because while smells in English are typically designated by the name of the emitter (*floral*, *rotting, fecal*), color words like *red* and *blue* seem to be stand alone concepts (but cf. *orange, turquoise*). But other languages like Yélî Dnye may more systematically opt for a designation-by-source-exemplar. Yëlî Dnye derives adjectives from both nouns and verbal gerunds – pure sugar is described as *nj:iinj:ii* 'salt.water-salt.water', but pure salt as *wiiwii* 'hurting'.

Dixon (1982) has noted that even within the adjective class in English there are "semantic types" which can be distinguished on semantic, syntactic and morphological grounds.

Three are particularly relevant here: (1) color, (2) physical property (includes descriptive terms such as *hard, soft; heavy, light; rough, smooth; hot, cold; sweet, sour* etc.) and (3) value (includes evaluative terms such as *good, bad; excellent, fine, delicious, atrocious* etc.). Color terms are a type because they form an incompatible set (the same surface patch cannot be simultaneously *red* and *blue*) and can be related hyponymically (e.g. *red* and *scarlet, crimson, vermillion*), but physical property adjectives are different in that they are mostly structured as antonyms (although taste terms may be more like an incompatible set). Syntactically, physical property adjectives occur before color adjectives in the noun phrase (e.g. *sweet red strawberries* and not **red sweet strawberries*). Morphologically, all physical property adjectives but only some color adjectives form derived adverbs with the *–ly* suffix (e.g. *blackly*, *sweetly, sourly, *redly*, *bluely*). The color/physical property division is also reflected in other languages. Frequently these appear in different word classes. While many languages encode color in the adjective class, physical property is often encoded as a verb (especially in languages with few adjectives).

Value terms like 'good' and 'bad', or 'big' and 'small' play an important role across sensory fields. Rossel people for example, speak of 'good smells' and 'good red', and 'good sounds' (pure tones) and 'bad sounds' (noises). Of special interest are "hedges" and "intensifiers", which may indicate a prototype structure in the domain, and therefore merit close attention, as in 'a real/strong/true red' or 'not really/a bit/sort of/like red' and the like. Note that it is not always easy to ascertain whether calling something "like red" or "sort of red" entails that it is red, or rather the converse, that it is not red.

Points to explore are the following:
1. Predicative vs. attributive use of the relevant adjectives (can one say both "the red book" and "the book is red"?).
2. Whether a single semantic domain like taste or color is entirely covered by adjectives, or whether nouns and verbs intrude.
3. Where adjectives are derived from object names, it is worth exploring how transparent that connection remains – for example, we probably wouldn't call a patch which is part orange and part green 'orange', but perhaps might call an appropriate partly mixed blue and green 'turquoise', indicating that the connection to the stone is still live.
4. How to modify the term to indicate that it is a prototypical exemplar, or in the other direction, to indicate it is a marginal one.
5. Whether there is internal structure to the vocabulary in a certain semantic domain (through covert categorization) – for example in Lao, there are two types of color term: (a) dedicated color adjectives which may undergo reduplication (*khiaw3* = 'grue', *khiaw-khiaw3* = 'somewhat grue'), (b) denominal color adjectives, defective in that they don't undergo the same reduplication (*faa4* = '(sky) blue' but not * *faa-faa4*). Notice how in English the color words show internal differentiation when derived: *whiten, redden, blacken* but not **greenen, *yellowen*, etc. – the internal differentiation follows the developmental sequence proposed by Berlin and Kay, with the older terms more versatile.

Finally, note that although we have organized this discussion by word class, it is particularly interesting to note similar patterns of semantic conflation (of the Viberg kind) *across* word classes. We noted above, for example, the Yélî Dnye conflations of 'hearing' and 'smell' across unrelated forms across three word classes, indicating some systematic category of 'perceiving at a distance by other means than sight'.

iv. Constructional specificities in the language of the sensations

There are many constructional resources that are likely to play a role in the language of the senses. First, note that many of the relevant terms may play different constructional roles. For example, English color terms have the obvious attributive (*red book*) vs. predicative uses (*the book is red*), but they also have nominal uses as in *What kind of red is this? This is a darker red*. Note in the World Color Survey it is often unclear how the terms were actually being used. When using the stimuli be sure to record the construction in which the relevant terms are being used, recording the question you used – distinguish clearly for example *It stinks*, from *stinky* and *a stink* (note that in some languages the difference may only become evident when one considers what is elided by virtue of the question asked).

Special attention must be devoted to the verbs which are likely to have all sorts of constructional variants. For example, the object of *watch, look, see* in English can only be elided if it is contextually definite (unlike, say *eat*). In some cases in English, when no particular object is intended, then the modal *can* is added: e.g. *I can hear* vs. *I hear*. It may often not be easy, for example, to decide whether a verb is labile between transitive and intransitive or whether arguments are simply being elided (cf. *John's looking (at the soccer) but Bill is not watching*). You need to vary verbs over aspects/tenses, argument structures and the like to get a handle on their constructional specificities.

Check carefully whether apparent (lack of) constraints in interpretation are specific to constructional environments. For example, the English verb *smell* in its 'copulative' usage does not entail an evaluative valency (good vs. bad) when there is an adverbial complement (*That smells delicious, That smells foul*), but with no such complement, only the negative reading is possible (*That smells*).

Another thing to be alert to is what informants find as the right frame. For example, it is odd in Yélî Dnye to say in effect 'the book is red' – the right way to say it is 'the body of the book is red' (*puku dmi u pââ mtyemtye*). This locution insists on predicating 'red' not of the object but of its body, here construed as surface. Color usually is a surface property, so this is the way to say it. If you mean red through-and-through you have to say e.g. 'the core of the tree is red'. These locutions are quite revealing of the native analysis of the properties in question, and need to be carefully explored.

It is very likely that phrases of one kind or another will play a central role, for example N-N compounds, or V-V serializations. Here it is crucial to get a sense of how lexicalized or conventionalized the collocations are, as opposed to how creatively constructed as a response, e.g., to an outlandish stimulus. Repetitive use across subjects is one clue of course, but stability across different occasions with the same consultant is also revealing. Text searches will be useful here too. As you get a handle on the vocabulary of these various domains, you can also try asking people for lists of e.g. color words, or taste terms – that will give you a sense for the saliency of some of these compound constructions.

v. Indirect classification – sensory categories in other word classes.

Ideophones and expressives may directly denote perceptual categories, or more often modify events, according to the language in question (cf. Doke 1935: An ideophone is "A vivid representation of an idea in sound. A word, often onomatopoeic, which describes a predicate, qualificative or adverb in respect to manner, color, sound, smell, action, state or intensity"). If your language has any such word class (cf. English onomatopoeic words

like *ping, gloopey, boing*), you'll want to find out what sensory modalities are targets, and how often more than one sense is involved in the concept. (See "Expressives" entry.)

Demonstratives often have perceptual constraints, of the kind that there will be a special 'this' for something held in the hand, or visible, and a contrastive 'that' for something heard but not seen, or indirectly ascertained. Earlier MPI research suggests that a number of languages (e.g. Turkish) code for 'this which we are both gazing at' vs. 'that which I am but you are not gazing at'. In these cases, the referent is clearly the thing intended, and the perceptual category is presupposed rather than foregrounded.

Evidentials are another place to look. They may oppose visual evidence vs. non-visual, cross-modal direct perception vs. indirect evidence, and occasionally (as in Kayasha) audition vs. vision. The literature is often vague about what counts as 'non-visual', so these categories need to be thoroughly explored if you have them. Again, these function as presupposed categories of assertion.

Classifiers and noun classes may also harbor covert perceptual categories. Many of the categories may have nothing to do with perception, being attuned to essence (human, animacy, gender, etc.) or substance (wood, liquid, etc.), but systems also often make shape distinctions which on close inspection are clearly visual – for example, they may collapse a sphere and circle in one category, which makes perfect sense from a visual but not a haptic point of view. Classificatory verbs are particularly likely to make shape distinctions, but they may also make distinctions e.g. in flexibility, texture and other haptic properties. In a broad sense, positional verbs (of the 'sit', 'stand', 'lie', 'hang' kind) also classify their nominal referents, typically by shape properties. The Mayan root class called 'positional' makes many interesting visual and haptic distinctions. If you have morphemes of this kind, probe carefully.

If you gather information on all these topics, you will have a good sense for how the language itself carves the perceptual world. This information will very usefully complement what you get from running the stimuli, and give you some confidence about whether the results from those tasks truly reflect the properties of the language.

B. Elicitation hints on exploring the semantic domains

Aside from investigating form classes, you may wish to further explore the semantics of terms elicited from the stimulus tasks. Particular attention should be paid to color, shape, touch, sound, smell and taste.

The stimulus tasks provide one route to meaning – the denotational component – but it is crucial to explore the intensional component, which the stimulus tasks do not tap directly. Furthermore, the stimulus tasks are obviously a miniature world of reference, so further exploration of the types of objects which may be designated by perceptual terms is important. Finally, you may wish to consider extended and metaphorical uses of perceptual terms.

(i) Intension

Intensional aspects of meaning can be explored in two main ways. The first is to explore a word in relation to its partner terms or alternates in a lexical field (its so-called 'sense relations'). *Blue* contrasts with *red, brown, yellow,* etc., and all these color terms form a set of salient alternates than can be elicited by asking *What color is it?* In this case, we

have a taxonomic structure, where the subordinate *crimson* is a kind of *red* which is a kind of *color*. Superficially, this looks quite similar to an ethnobotanical taxonomy (an *oak* is a kind of *tree* which is a kind of *plant*), but the contrastive relationship between terms of the same level is in fact different, since *red* is a property concept, and is compatible with many other property concepts like *shiny, heavy, smooth*, etc. Moreover *the train is yellow and blue* is fine, unlike *that plant is an oak and a pine.* In any case, the first thing to do is check for each of your domains, how the terms are related to each other – are they contrastive alternates, strict antonyms, subordinates (hyponyms), or superordinates.

The second line of exploration is the entailment relations and implicatures holding between sentences containing the relevant words. For example, *the flag is scarlet* entails *the flag is red/colored*. *The flag is white* might seem to entail *the flag is not red*, but in fact since we can say *the flag is white and red*, the relationship of exclusion is only implicated. Note the same suggestion of 'X all over' holds of *the stone is smooth/shiny/warm*, etc., or *the food is sweet/sour/salty,* but not of other property concepts like *torn, stained, dented* (if something is torn in one place, it is torn; see Levinson 2000 p. 100).

Intensional analysis may also give clues about subdomains, for example "evaluative terms" (e.g. *this feels nice*, *this tastes delicious*, *this smells horrible*), and "descriptive terms" (e.g. *this feels warm*, *this tastes bitter*, *this smells pungent*) seem to be separate fields in English. Evaluative terms carry implications about the negation, but not about the descriptive content (e.g. *this tastes delicious* implies that it does not taste *bad* but does not carry an implication about whether it tastes *sweet, sour* etc.). Evaluative terms may be general over a number of senses, e.g. *good, bad*, but may also be restricted to a particular sensory modality. Japanese, for example, has a set of taste evaluative terms which are distinct from more general evaluative terms, thus *kono tamago wa oishii/umai* 'these eggs are good(-tasting)' versus *kono tamago wa ii* 'these eggs are good (in quality, size, etc)' (Backhouse 1994). This contrast is important to keep in mind when considering the meaning of terms elicited using the standardized kits. Are the terms being elicited purely evaluative terms or do they carry descriptive content too? (Of course, descriptive terms may carry an evaluative component too, but evaluative terms solely capture affect.)

As well as examining which contexts are shared between items, we can also consider the relations between words that co-occur within a context, i.e. its collocation. For example, *blonde* in English collocates with *hair* and particular types of *hair* such as *moustache, beard* etc. This may be relevant to examine, for example, the applicability range for perceptual terms. For instance, in English *sweet* collocates with *taste* and *smell* (and perhaps *hear*) but not with *see* or *feel* (*This tastes/smells/?sounds sweet. *This looks /feels sweet*).

(ii) Extension

Using the terms elicited during the standardized tests, you may wish to conduct further elicitation to discover what range of objects can be described as having that property, using questions such as *What tastes X? What smells X? What feels X?* etc (using the appropriate forms as described above). This will provide a list of exemplars for specific perceptual categories. This is the type of approach used by Aschmann (1946) to illustrate Totonac smell categories (see entry on olfaction).

(iii) Basic versus extended meanings

Are the terms under consideration core members of a particular sensory domain, or are they somehow extended from other domains? Consider *hot* meaning spicy, angry or bright (as in *hot pink*). Narrowing of meaning, extensions of meaning and metaphorical or analogical application are all normal processes of language change. But the question is: is an old metaphor still live (still connected to its source domain) or is it now just another sense of the lexeme? You can get some handle on these issues by seeing whether the term in question keeps popping up in elicitation tasks: (a) Ask people to list all the taste terms they can think of – does 'hot' come early or late? Do all the subjects mention it? (b) Ask people for antonyms – if you say 'sour', will they say 'sweet', if you say 'bland' will they now say 'hot'? (c) Does the term have the same range of syntagmatic occurrences – does it modify with the same expressions for example (cf. 'nice and sweet/sour/hot').

Part II. Ethnographic Notes on the Perceptual Field

Again, a thorough anthropology of the senses would be a serious undertaking (see e.g. Feld 1984 for inspiration), but you should try to observe the cultural uses of different sensory modalities. One reason to do this is the hypothesis that elaboration of verbal distinctions in the various sensory fields may be largely motivated by cultural factors, including art and technology. For example, Rossel Island culture has a simple material culture (almost) without (traditional) paints, dyes, textiles, pottery or musical instruments – it seems entirely plausible that the corresponding absence of a full color terminology, texture vocabulary or musical metalanguage is closely related to this. Note that this is a generalization of the hypothesis in Berlin and Kay (1969), where they guessed that the *number* of color words was tied to levels of technology (for a more thoroughgoing cultural approach to the growth of color terminology, see Gage 1995).

A good place to start is artistic activity in a broad sense. Start to notice how elaborated the different art forms are – visual art, music and oratory, patterned textiles, cuisine, the use of scents, and so forth. What kind of technologies underlie these art forms – for example, are there indigenous dyes and paints, how many colors were traditionally manufactured or purchased from outside, are there specialists in these areas, or are all members of the community potentially involved? Are there names for specific patterns in carvings or textiles? In the case of music, what instruments are manufactured, are they tuned to a standard, what kind of metalanguage is used in instruction or rehearsal, are people said to be good singers, and if so how are their special skills described? In the case of cuisine, are there acknowledged excellent cooks, how do people talk about the food they produce, how many different kinds of flavorings do they employ? If there is indigenous production of textiles, what do people value in clothing – strong or soft, fine or coarse, plain or patterned, and how do they talk about these distinctions (e.g. Tamils, with their interest in silk saris, have an elaborate terminology for textile textures and patterns). When young people try to attract members of the opposite sex, do they use scents, perfumes, oils, flowers? Are such scents or incenses used in rituals, and if so, are there patterned oppositions (god X likes scent A, god Y scent B)? How do they talk about these scents?

Look carefully at the technology involved in the local production of chattels – pots, houses, canoes, carts, textiles, baskets, carvings, body ornaments and the like. How do people talk when assessing whether such objects are well or badly made? What sorts of shape, color, pattern, texture discriminations do they make? Why do they admire or seek specific exemplars?

Other activities, such as herding may also give rise to specialized vocabularies. For example, the Nuer have several hundred terms for describing zebu coats (color and markings) and other terms specialized for describing horn shapes (Evans-Pritchard 1940).

Note both the culturally constructed and the natural ecological "sensorium". Do people spend a lot of time alone in the forest, or desert, or on the sea or mountain top? If the world is visually closed, as in a jungle, are auditory cues essential for finding your way, locating prey, detecting intruders and the like? Can people infallibly recognize bird species by their calls? One might expect an elaboration of the auditory semantic field in this case, and additional relevance of auditory distinctions in evidentials, deictics and the like. Conversely, if the ecology is open, as in steppe, desert, ocean or high montane country, is there a premium on visual acuity? The ethnographers commonly report amazing abilities to detect and identify distant people, vehicles and boats in these cases – but we know little about how people talk about this (if they do). Turning to the cultural ecology, notice the structure of houses, and how they are built to either hide or display, to dampen or transmit sound, and note features that require specific and complex shape templates (curved roofs, circular ground plans, shaped ovens, etc.). Think about the soundscape of village life – is there a noisy hubbub of social life, or rather a quiet privacy? Are there noises of pounding or grinding grain, or bells, at particular times? What would constitute unusual noisiness or unusual quiet? Think too about 'smellscapes' – are there persistent smells of smoke, spices, incense, sewers, bodies? Do people complain about smells?

The issue of when and why people actually use the language of perception is an over-arching question. If you have observed a semantic distinction in the language and do not (yet) see any cultural correlation, then try to get a sense of when and why people *use* the linguistic distinction in question (since, after all, the distinction would not have been learned by speakers if it were not being used in some communicative context). For example, the Karìì have no traditions of painting, carving, or sculpture, yet they have fine vocabulary for three-dimensional shape distinctions (tubular, spherical, etc.) and for surface patterning (single-striped versus multi-striped, sagittal versus lateral, tipped, etc.). They use this vocabulary for describing and distinguishing between many species of mammal, reptile, bird, fish, etc.

These notes should start you off thinking about the specific properties of the perceptual world of your field site. Understanding these factors may prove essential in getting a grip on why the culture in question cares, or does not care, about specific domains, thus providing a special motive for lexical elaboration or the lack of it.

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