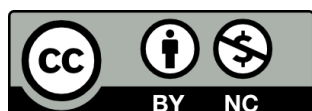

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Perception verbs across languages: A review from a typological, linguistic anthropological, and cognitive linguistic perspective

P. (Peggy) van Minkelen

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Perception verbs across languages: A review from a typological, linguistic anthropological, and cognitive linguistic perspective

P. (Peggy) van Minkelen
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Abstract: This paper reviews perception verbs to describe the sense modalities sight, hearing, touch, taste, and smell from three research traditions, namely, a Linguistic Typological, Linguistic Anthropological, and Cognitive Linguistic perspective. The aim of this review is to provide an assimilation of those three perspectives, predominantly based on cross-cultural conversational data. The Linguistic Typological perspective describes the hierarchy of perception verbs, supporting Viberg's vision dominance hypothesis (1983). The Linguistic Anthropological perspective describes cultural influences on lexical distribution, suggesting that language influence perception and therefore languages differ in how sensory experiences are linguistically divided. The Cognitive Linguistic perspective describes the interaction between language and thought, providing evidence of the Cognitive Science view to the detriment of Linguistic Determinism. Finally, this paper describes three accounts on the extended meaning of perception verbs into cognitive concepts.

Keywords: Language of perception, Vision dominance hypothesis; Lexical distribution; Cultural relativism; Language and cognition

1. Introduction

Humans perceive the world around them through their senses. The five traditionally described and researched senses are sight, hearing, touch, taste, and smell. The sensing organs, each affiliated with a sense, send stimuli to the cortex for processing. Language enables humans to share the sensory information that has been processed. According to Majid and Levinson (2011) language holds a paradox. They claimed that, on the one hand, language is primarily linked to seeing and hearing, since language is expressed and perceived through those senses, resulting in inferior abilities to express touch, taste, and smell. On the other hand, language, in the sense of "a particular tongue" (p. 7), enables humans to express their perceptual experiences including touch, taste, and smell through seeing and hearing. In other words, sharing experiences of touch, taste, and smell, besides seeing and hearing, ought to be expressed through language, thus by the perception verbs describing seeing and hearing.

Extensive research has been done into the language of perception. Within this research field, this review focused solely on the five traditionally researched perception verbs to describe the sense modalities sight, hearing, touch, taste, and smell, and will exclude the vestibular sense and proprioception, as well as human echolocation used by blind people to navigate and sometimes identify things in their surroundings. Moreover, this research will not aim at investigating morphological constructions

within the perceptual field. Furthermore, this review did not include multi-sense verbs, meaning verbs to express the perception of multiple senses.

However, this review did examine the five traditionally researched perception verbs to describe the sense modalities sight, hearing, touch, taste, and smell, from three research traditions, as proposed by Evans and Wilkins (2000). These research traditions are a Linguistic Typological perspective (section 1.), a Linguistic Anthropological perspective (section 2.), and a Cognitive Linguistic perspective (section 3.). The aim of this review is to assimilate those perspectives to contribute to research on the relationship between human's perception of the world, how perception and language influences one another, and cognition. Additionally, this review predominantly focused on conversational data, because as Levinson (2006) already indicated, "language evolved for . . . communication in interaction" (Levinson, 2006, p.42). It was suggested by San Roque et al. (2015) that all languages are used in communicative interaction, while it might be the case that some languages do not contain literacy.

2. Linguistic Typology

2.1 Hierarchy of perception verbs

The first research tradition *Linguistic Typology* focused on the way the sensorium, the sum of one's perception, is divided in language. Viberg (1983) contributed substantially to this research field by examining how the five traditional sense modalities (sight, hearing, touch, taste, and smell) are lexically divided. He then divided those five sense modalities into three components, activity-based, experience-based, and source-based, whereof the latter he referred to as *copulative* (e.g. 'A looks funny', Viberg, 1983, p. 124), in which there is no perceiver present. Dividing the five traditional senses into these three components resulted in a maximum possibility of fifteen different sense terms per language. Table 1. shows Viberg's table for English, in which he explicated that English has three basic sense terms for the modalities sight and hearing, compared to only one sense term per modality of touch, taste, and smell (Viberg, 1983).

Table 1. Viberg Table of English (Viberg 1983: 128)

	activity	experience	copulative
sight	look at	see	look
hearing	listen to	hear	sound
touch	feel		
taste	taste		
smell	smell		

Viberg (1983) examined 50 languages, based on a translated core set per language, and compared those languages to their semantical organization of perceptual verbs. Based on these comparisons, he concluded the existence of a hierarchy of sense modalities, namely from top to bottom, sight, hearing, touch, taste, smell. He argued that sight is the most salient modality, firstly because all languages have a perception verb referring to the sense modality sight, except

Kobon¹, and secondly, the high emergence of sensory experiences referring to sight, contributes to this hierarchy. The hierarchy of sense modalities resulted in two universal conclusions, namely, that in all language across different cultures the modality sight is dominant over the other four modalities, and secondly that all sense words are ranked similarly across all languages. Viberg (1983) claimed that this ranking exists in a unidirectional way, meaning that the modality sight can be extended to the modality hearing, and the modality hearing can be extended to the modality touch etcetera, however not vice versa.

Evans and Wilkins (2000) found support for Viberg's universalist account by researching 69 Australian languages, which they claimed were under-represented in Viberg's research. Their evidence showed close similarity to Viberg's findings (1983) concerning the lexicalization of perception verbs. However, the sense modality proprioception which is used notable in many Australian languages was disregarded in the research of Viberg (1983), whereby Evans and Wilkins (2000) decided correspondingly to leave this sense modality out of their research, because comparison of data proved impossible.

Correspondingly, San Roque et al. (2015) analyzed the two universalist claims that derived from the research by Viberg (1983) by investigating the frequency of words within the perception field. They analyzed 13 languages of everyday conversations in which people shared experiences of seeing, hearing, feeling, tasting, and smelling. They found evidence supporting Viberg's vision dominance hypothesis (1983) in 12 out of 13 languages, except Tzeltal². However, they did not find evidence that the ranking of the senses is universal cross-linguistically. They suggested that cultural differences lie at the basis of this variation. Despite the variation in ranking, their data showed that the sense modality hearing is ranked second in all researched languages except Semai³. In Semai the sense modality smell appeared second, after sight.

San Roque et al. (2015) proposed three accounts for their supporting evidence on Viberg's vision dominance hypothesis (1983). Firstly, all humans experience a prepossession for the sight modality on the grounds of biological predominance of visual sensory information. Secondly, expressing perceptual experiences of seeing is not constrained by anything other than the experience that is shared. Finally, the sight modality comprises more than the shared experience solely, it contributes to joint attention between interlocutors.

Winter, Perlman, and Majid (2018) continued the research on Viberg's vision dominance hypothesis (1983) by focusing on the usage of perceptual language in a quantitative study. They found a correlation between the frequency use of perceptual language of sensory modalities and the lexical differentiation of that sensory lexicon. This type-token frequency correlation implicated that sense modalities that are more often used in language induced a more lexically discriminated lexicon. This could be considered as the fourth account, besides the aforementioned three accounts proposed by San Roque et al. (2015), supporting Viberg's vision dominance hypothesis (1983).

1 Kobon is a language spoken in Papua New Guinea.

2 Tzeltal is a language spoken in southeastern Mexico.

3 Semai is a language spoken in western Malaysia.

2.2 Lexical distribution of perception verbs

There are three known sources that can be held accountable for the lexical distribution of perception verbs. The first source was described by Levinson (2006) which he referred to as “the interaction engine” (Levinson, 2006, p. 44). He described this source as humans’ mental capability to combine the communicative intentions with the natively fitted core ability to interact with other humans. These intentions are meant to influence the behavior between interlocutors with a common goal using joint attention within a common ground.

The second source responsible for dividing the sensorium in language is biology, by allowing human to perceive sensory experiences through the senses (Majid and Levinson, 2011) and additionally distributed the sense modalities within the sensory cortex. Levinson and Majid (2014) marked the dominance of the sight modality in the cortex.

The third source that played a significant role in the distribution of perception verbs in the lexicon is culture. It is the culture people live in that yields the environment in which experiences of seeing, hearing, feeling, tasting, and smelling occur, that one wants to share (Majid and Levinson, 2011). They explicated that the distribution of the perceptual lexicon provided insight in the cultural structure of the sensorium.

3. Linguistic Anthropology

3.1 Environmental influence on lexicon

The second research tradition, *Linguistic Anthropology*, focused on the aforementioned third source of lexical distribution of perception verbs, given the cultural variations in the use of sensory modalities and their relative magnitude. In a broader sense, it focused on how language shapes communication and enables cultural common representations.

Boas (1911) is seen by many as the founder of Northern American anthropology. He examined different Eskimo languages (*Inuit languages*, see nomenclature) and their lexicalization of words for sea ice and snow. Boas (1911) found that Eskimo languages contained a much more varied lexicalization of words for sea ice and snow than English. Firstly, he linked this difference to the main interest of people using those languages, in other words, the interest of Eskimo’s in snow resulted in a more diverse lexicon regarding snow phenomena. By contrast, English words for snow all consist of the stem ‘snow’ combined with other word(s) or a complementary stem, whereas the Eskimo lexicon consist of lexically distinctive words, (e.g. *aput* (Eskimo language) – ‘snow on the ground’ (English), *qimuqsuq* (Eskimo language) – ‘snowdrift’ (English)). Secondly, he argued that the need to express a specific phenomenon by a single distinctive word derived from the environment people who use that language live in. In other words, if a phenomenon stands alone in the lives of people, a single term may arise. He argued that in English different phenomena concerning *water* are lexically distinctive in words like, e.g. *liquid*, *lake* and *dew*, and that it is “perfectly conceivable that this variety of ideas, each of which is expressed by a single independent term in English, might be expressed in other languages by derivations from the same term” (Boas, 1911, p. 25).

Pullum (1989) criticized Boas’ (1911) claim concerning derived words for snow in English oppose to lexically distinctive words in Eskimo languages,

which he referred to as the *Great Eskimo Vocabulary Hoax*. He stated that “things could have been otherwise” (Pullum, 1989, p. 276) by which he seemed to be aiming at the randomness of one language using derived words versus another language using lexically distinctive words to express a phenomenon. Furthermore, he questioned Boas’ (1911) findings that the interest of the Eskimo’s was at the base of their broad lexicon regarding words for snow. Pullum (1989) reduced it to the fact that people who encounter specific phenomena more often, use a more specific lexicon to address those phenomena. He compared the Eskimo lexicon for snow with pressmen lexicon for different types of fonts.

In contrast, Krupnik and Müller-Wille (2010) adopted Boas’ (1911) research and expanded this by examining “20-some” (Krupnik et al., 2010, p. 391) Arctic cultures concerning their lexicon of words for sea ice and snow. This research was allied to the Siku project⁴. Krupnik et al. (2010) found empirical support for Boas’ claim (1911) that Eskimo languages indeed consist of a more detailed lexicon to refer to phenomenon of snow, compared to English. Krupnik et al. (2010) found the same results for phenomena of sea ice and additionally, that these differences in lexicon occurred not only within Eskimo languages but also within other languages in the polar regions. The empirical evidence suggested that Boas (1911) had found more than four Eskimo words for snow than he noted down. Krupnik et al. (2010) suggested that Boas (1911) tried to prevent the inclusion of derivatives referring to snow which may underlie his choice for those four words. They concluded not only that Boas’ (1911) research is empirically supported and therefore valuable, but also that the *Great Eskimo Vocabulary Hoax* is a misconception of Boas’ (1911) research. They stated that the hoax arises from the fact that the four original documented terms for snow in Eskimo language by Boas (1911) were continually increased in number by inaccurate reuse until eventually two-hundred different terms for snow.

Similarly to Boas (1911), but from the opposite starting point, Whorf (1956) contributed to the research on lexicalization. He claimed that the undeniable presence of certain phenomena abated the need to designate those phenomena as such, simply because they are always present. He described the instance of people with a visual impairment which caused them to only see blue. For those people the word blue would not express a meaning which people without that disability refer to as the color blue, so their lexicon would lack any color words. Furthermore, and similar to Boas (1911), Whorf (1956) found a causal relation between the environmental temperature and the lexical division of words relating to snow and ice. However, this causality is vice versa. In a warm environment the need to be able to communicate distinctively between phenomena of snow and ice is less than in colder environments where a distinction has communicative value.

Regier, Carstensen, and Kemp (2016) grounded their research on Boas’ (1911) claim and Whorf’s (1956) inversed application of Boas’ (1911) claim, in which they endeavored to expand the debate beyond Eskimo languages. In particular Regier et al. (2016) elaborated on the study by Whorf’s (1956) research, since research into languages in warmer climates offered the opportunity to investigate more languages, because there are fewer languages present around the polar regions. Regier et al. (2016) examined the relationship between environment and “communicative need” (Regier et al.,

⁴ Siku is an abbreviation for ‘Sea Ice Knowledge and Use’, as well as an Inuit word referring to ice.

2016, p. 2), based on the general hypothesis that “language is shaped by the functional need for efficient communication” (Regier et al., 2016, p. 2). They described a causal sequence which stated that the environment formed the “communicative need” (Regier et al., 2016, p. 2), based on the main interest of people and within a culture that required certain communicative content. This requirement in turn formed semantic categories. From a universalist point of view, this claim would not hold. They would claim that words for sea ice and snow are differentiated in the lexicons across all languages. However, from a cultural relativist point of view the lexical differentiation of words for sea ice and snow diverged across languages. Regier et al. (2016) found evidence partly supporting both the universalist and cultural relativist claims. Their research showed on the one hand, that languages contained lexically distinctive words for sea ice and snow irrespectively of the temperature of the location the language is used in. On the other hand, discrimination within the lexicon was reduced in warmer regions. They attributed their first finding to the influence of languages from other cultures on cultures in warm regions, as a result of colonization. As far as the latter finding is concerned, they proposed that the limited communicative need to express phenomena of sea ice and snow would reduce lexical discrimination.

3.2 *Cultural influence on lexicon*

Majid (2015) indicated, in line with Regier et al. (2016) that different cultures might require different lexical content. She stated that languages across the world differ greatly in how they divide sensory experiences through language, based on the influence of ecological and environmental factors on the sensory lexicon. In contrast with Regier et al. (2016) who focused more on the environmental influence on the sensory lexicon, Majid (2015) focused more on the influence of the experiences of the language user in relation to the sensory lexicon. She explicated that experiences can distort the sensory lexicon at an individual level.

On a more global language level, Majid et al. (2018) examined the sensory lexicon cross-culturally. They found, in line with Majid (2015), that languages indeed differed in how they linguistically divide sensory experiences. These differences were caused by cultural emphasis, e.g., in cultures in which music plays an important role in everyday life, the sensory lexicon for sound words proved to be more diverse, compared to cultures in which music is not strongly embedded.

Likewise, Floyd, San Roque, and Majid (2018) explored the Cha’palaa⁵ language and their lexicon referring to experiences of smelling. They suggested that the extensive way in which smell is integrated in that culture, e.g. in traditional tales and rituals, shaped their olfactory lexicon, which is in line with the findings of Winter et al. (2018), who found a positive correlation between frequency use and lexical differentiation. Floyd et al. (2018) stressed out the ongoing debate on whether language use causes language change, or vice versa, that language use is the result of language change. In the case of the Cha’palaa language, the question arose if the cultural dominance of smell induced the amount of olfactory words? Or, whether the amount of olfactory words provoked the frequency use?

⁵ Cha’palaa is a language spoken in Ecuador.

In the study by Majid and Levinson (2011), they claimed that the way the sensorium is divided within a particular language can influence the way a sensory input is perceived and how people respond to those stimuli. In the case of the Cha'palaa language this would mean that the Chachi community, whose language is Cha'palaa, experience smell differently than communities whose frequency use of smell terms is much lower. This suggested that language influence the way people perceive the world cross-culturally and it might even influence the way people form mental representations.

4. Cognitive Linguistics

4.1 *Linguistic Relativity*

Mental representations, in the context of this paper only linguistic mental representations, are a mental imagery of experiences people have, examined from the third research tradition *Cognitive Linguistics*. Those experiences can be seen as cognitive input, which can be processed as thoughts. A thought can in turn serve as a starting point for output in the form of language. Thinking itself can also be considered in terms of language, since people are able to hear their thoughts, so called implicit speech. This meticulous cooperation between language and thought lies at the base of Linguistic Relativity, which is often referred to as the Sapir-Whorf hypothesis, although Sapir (1884-1939) and Whorf (1956) have never co-written any article together. Linguistic Relativity incorporated three main assumptions. Firstly, the assumption that languages around the world comprise different semantics. Secondly, that those semantics can influence the manner in which the world is perceived by its language user, in other words that language can determine thinking. The final assumption holds the idea that language users of one language indeed think differently than language users of another language.

Wolff and Holmes (2011) surveyed seven versions of the Sapir-Whorf hypothesis, among which the so-called *Linguistic Determinism*. This concept of Linguistic Relativity holds the idea that language users of different languages think differently, assuming a strong relationship between language and cognition. However, Wolff et al. (2011) provided evidence supporting the Cognitive Science view, which holds a stronger relationship between thought and the world, to the detriment of Linguistic Relativity. Their cross-linguistical evidence showed a greater variety in lexicon than could fit the differences in thought, which disproved the claim that language determine thought. However, it is through the perceived difference between language and thought that language and thought influence each other.

4.2 *Extension of sense verbs into the cognitive domain*

In taking a cognitive approach to the interaction between language and thought, Evans and Wilkens (2000) explicated on a second universal hypothesis besides Viberg's vision dominance hypothesis (1983), namely Sweetser's (1990) hypothesis about the universal connection between sight and intellection. She claimed that the precedence of the modality sight in human experiences, which she claimed also holds, but to a lesser extent, for the modality hearing, caused this extension of perception into cognition. This is in line with the remark of Levinson and Majid (2014) were they mentioned the influence of the relatively

large amount of cortex being involved in processing visual input to the dominance of the modality sight. Sweetser (1990) described the extended meaning of the modality sight, e.g., perceptual experience seeing would be extended to the cognitive interpretation *know*, to be linked to higher cognitive functions.

However, Evans and Wilkens (2000) examined 69 Australian languages in which they found that the modality hearing is more intensively connected to higher cognitive functions in comparison to sight, suggesting a cultural variation. They provided, among other things, the example of languages in which knowledge transfer is mainly verbal, e.g., in songs and narratives, rather than textual, which can explain the perceptual experience hearing as extension for the cognitive interpretation *know*.

This cultural relativist claim of Evans and Wilkens (2000) is partially endorsed by San Roque et al. (2018), who investigated 13 languages of which they recorded everyday conversations. They found evidence that the meaning of the modality sight was extended to cognitive concepts in all researched languages. Furthermore, they found that the extended meaning of the perceptual experience hearing is almost all linked to meanings related to communication and speech, e.g. hearing as extension to *understand* and *tell*. Yet, hearing was only used in three out of the 13 languages as extension for the cognitive interpretation *know*.

As a result, San Roque et al. (2018) suggested a third account in the field of the extension of perception into cognition as well as in the lexical differentiation of words. They suggested, alongside universalism and cultural relativism, the “interactionally-driven universals” (San Roque et al., 2018, p. 399), originated from humans need for social interaction. Here-with, they are in line with the assumption of the interaction engine” (Levinson, 2006, p. 44) as an account for lexical distribution of perception verbs.

5. Conclusion

This review aimed to explore and assimilate the five traditionally described sense modalities, sight, hearing, touch, taste, and smell from three research traditions, as proposed by Evans and Wilkins (2000).

The *Linguistic Typology* section showed widely supporting evidence of Viberg’s vision dominance hypothesis (1983) against the background of the hierarchy of perception verbs. Furthermore, this section tapped into the known sources that can be held accountable for the lexical distribution of perception verbs.

The *Linguistic Anthropology* section described the influence of the environment on lexical distribution, starting from Boas’ (1911) research on Eskimo languages leading to the research by Regier et al. (2016) on the need for efficient communication. The cultural precedence found in the aforementioned studies raises the question whether this is universal around other cultures and if this result in similarities in their languages.

The *Cognitive Linguistic* section depicted on the interaction between language and thought, disclaiming the so-called *Linguistic Determinism* in favor of the cognitive science view. One issue which might need further investigation is to what extent the cultural similarities are based on a kind of generic cognition. The second part looked into the extension of perception verbs into cognitive concepts, designating a third account which can be held accountable for the extension of perception based on human communication in interaction.

Nomenclature

The term “Eskimos” was used to unquestionably refer to previously conducted research using this term as such. It is by no means the intention to be offensive to the Inuit by using this term.

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