

Body, Cognition and Language*

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Rhee, Seongha. 2006. *Body, Cognition and Language*. *The Journal of Linguistic Science* 36. 175-194 This paper examines the interaction among the body, cognition, and language by investigating the compounds and idiomatic phrases involving human body and the frequency of the body part terms in corpus. Major findings of the investigation include that among the four perceptual organs EYE shows the highest level of frequency both in terms of corpus tokens or of diversity in the formation of idiomatic phrases, suggesting the relative importance of the visual perception. In terms of their reference to cognitive activities, EYE shows unparalleled supremacy as well: it refers to various functions of human mental faculty and emotions, such as acuity, memory, intellect, awareness, attitude, preference, etc., all traceable to the visual perception in human experience. On the other hand, EAR is associated with intention, motivation, propensity, etc. often derivable from its auditory perception. However, MOUTH is more closely related to its speaking function, rather than gustatory function, such as reticence and verbosity. NOSE, on the other hand, is associated with pride and vivacity, which do not seem to be directly derivable from its bodily function but more relevant to postural configuration. This paper presents an analysis of how such differences are motivated across categories, and how such expressions are increasingly unitized either through compounding or idiomatizing, in the process of which new cognitive meanings are acquired through such mechanisms as metaphor or other cognitive strategies.

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1. Introduction

Human body provides us with a ready reference for conceptualizing world events, and body-part terms figure among the most frequently-used vehicles in metaphorization (Heine 1997, Lakoff and Johnson 1980, Claudi and Heine 1986). Since those body-parts whose primary function is perception, such as seeing, hearing, smelling, tasting and feeling, deeply permeate human cognition, it is only a natural consequence that the body-part terms often develop into expressions designating perceptual and cognitive activities. This observation seems to hold across languages and Korean is not an exception.

Among the models widely subscribed to by the researchers of human cognition as revealed in human language are the body-part model, the landmark model, and the zoomorphic model (Heine 1997). Of these models, the body-part model is the one most often exploited, even though there are some cross-cultural and cross-linguistic variations. It has been noted that from a configurational point of view human body-parts and their location in the upright position are the physical base for spatial references (Heine et al. 1991, Svorou 1988, 1994). From a functional point of view, the functions of human body are closely related to human cognition and conceptualization (Sweetser 1991, Rhee 2001). For this reason corporeal metaphors are among the most common types of metaphors (Lakoff & Johnson 1980).

This paper investigates the patterns of use of some of the perceptual body-part terms in Korean in order to identify how the bodily function is construed as one linked to cognitive activities. Of the five major senses, i.e. visual, auditory, olfactory, gustatory, and tactile senses, an idiosyncrasy in Korean is such that the tactile sense is not exclusively tied to a particular body-part such as hand or skin but to other nouns or adjectives whose semantic designations are associated with the tactile sense.

Therefore, this paper limits its focus on the use of only those remaining four sense organs such as eye, ear, nose and mouth, and investigates how such expressions are organized in syntagma and form paradigms, based on the data from a contemporary corpus. The discussion focuses on the functions of those body-parts with reference to their cognitive and linguistic significance from a cross-cultural perspective.

This paper adopts both qualitative and quantitative approaches. For a qualitative approach, it analyzes the semantics of the linguistic forms involved, with special reference to their capabilities to refer to non-physical entities. Central to this method is the concept of constructions in which two or more linguistic forms form a conceptually unitized concept, albeit at varying degrees. Idiomatic constructions are important in the sense that they serve as prefabricated lexical items, though they may be morpho-syntactically complex as clausal or phrasal, whose meanings are obviously related to the original lexical concatenative meaning, yet they are something more than, or other than, the combinatorial meanings. These body-part terms also actively participate in creating compounds. Compounding often renders mere combinatorial meanings, but the majority have the same characteristics as the idiomatic constructions in that they carry more than lexical meanings as a result of their participation in compounding. As a convenient label in this research the term 'construction' is used as including idiomatic phrases and compounds.

For a quantitative approach, it makes use of the frequency literature and a corpus. As for the former, a frequency list developed by National Academy of the Korean Language (2002) is used. As for the latter, the corpus developed by Korean Advanced Institute of Science Technology (KAIST), labeled as KORTERM, is utilized to collect construction types and token frequencies.

2. Sensory Perception and Cognition

Among numerous bodily functions, sensory perceptions are among the most basic ones, despite the fact that there are other seemingly more urgent and vital functions

that are directly connected to life-sustenance, such as respiration, metabolism, and others. It may be due to the fact that the information gathered from bodily perception is utilized in decisions of the organism for life-sustenance, such as securing food and ensuring safety. However, it is noteworthy that the sensory body parts are not always primarily associated with the sensory functions. For example, nose is for olfactory sense perception, but it carries the respiratory function in addition to the smelling function. The five major senses and their salient functions can be summarized as in (1).

(1) Five Major Senses and Salient Physical Functions

visual:	eye	see
olfactory:	nose	smell, breathe
auditory:	ear	hear, listen
gustatory:	mouth (tongue)	speak, eat
tactile:	hand (skin)	work, feel

An interesting aspect of the body-sensation-cognition interplay is the fact that sensory organs and/or perceptions thereof are sometimes equated with their associated cognitive functions. This is well illustrated in English examples in (2).

- (2) a. eye: He lost one eye. He eyed the man's Rolex watch.
b. see: I saw the tree. I see what you mean.
c. ear: He has two ears. He turned a deaf ear to my advice.
d. listen: He listened to the radio. He wouldn't listen.

In examples in (2) we see that the body-part terms in the first column make reference to the physical body-parts, whereas those in the second column, to more cognitive, or at least, less physical aspects associated with such body-part terms. This is consistent with the Korean state of affairs as shown in (3)-(6).

- (3) a. nwun 'eye'
 b. nwun-i khun salam 'a person with big eyes'
 c. nwun-ul tollita 'to ignore (Lit. to turn one's eyes)'
- (4) a. pota 'to see'
 b. say-lul pota 'look at a bird'
 c. cal po-a 'Pay attention (to understand). (Lit. Look well.)'
- (5) a. kwi 'ear'
 b. kwi-ka aphuta 'to have painful ears'
 c. kwi-ka ttakapta '(I'm) tired of hearing that. (Lit. Ears hurt.)'
- (6) a. tutta 'to hear'
 b. radio-lul tutta 'to listen to a radio'
 c. mal-ul cal tutnunta '(He) is obedient (Lit. (He) listens well)'

As shown in (3)-(6), the nominals of the body-part terms or the verbals denoting bodily functions in (b) examples refer to physical entity or physical functions. On the other hand, those counterparts in (c) examples make reference to more cognitive or mental activities. However, sensory perceptions and their associated functions are often so close that their distinction is not always straightforward as is well illustrated in (7) and (8).

- (7) a. I will see that they come home safely.
 b. I heard nothing about that.
- (8) a. ku yenghwa-nun nwunmwul epsi-nun po-lswueps-ta
 the movie-Top tear without-Top see-cannot-Dec
 '(You) cannot watch the movie without tears.'

- b. ku ay-nun yocum nay mal-ul an tut-nun-ta
the child-Top these.days my word-Acc not hear-Pres-Dec
'The child does not hear my words.'

Example (7a) can be a mere statement of a future event of visually perceiving their coming home safely, but it can be a statement of intention whereby their safe return is warranted. In the latter case, the 'seeing' event is more than a simple natural perception; it involves a supervisory monitoring act to ensure their journey. The variable interpretations in (7b) are more subtle: it can be either of physical hearing (non-hearing, to be precise), or of understanding (no knowledge, to be precise), i.e. the speaker's epistemic states.

Likewise, the Korean examples in (8) show similar distinction. (8a) either refers to an act of physically watching a movie or mentally appreciating the content of the movie, even though this distinction is so fine that we are usually unaware of it. This is a piece of evidence of how directly and deeply our physical perception is related to our mental activities. Example (8b) has two readings as well: a mere fact that the child does not hear my words, either by his being physically located too far from the speaker, or more simply, by the speaker's not saying anything to the child; or a fact that the child wilfully goes against my stated intention or instruction.

Thus far we have seen that human body-parts, perceptual functions, and cognition are very closely related, sometimes to such a point that they may be interchangeably used, or that they can be so ambiguous that a distinction is impossible. Now we turn to a discussion of individual sensory organs and of their manifestations in language.

3. Sensory Organs and Language

3.1 Eyes

In many languages EYE often develops into locative marker 'front', 'between', 'in';

temporal marker 'before'; directional marker 'to'; future marker, etc. (Heine et al. 1993, Svorou 1994, Heine & Kuteva 2002). Likewise, SEE often develops into allative marker; and locative marker 'to', 'towards', etc.; and passive marker. In addition to the development into grammatical markers, EYE and SEE also show their linguistic salience through the fact that they often surface in idiomatic constructions.

Korean has a rich inventory of 'eye'- and 'see'-constructions: 200 'eye'-constructions in compounds and idioms and 77 'see'-constructions in compounds and idioms, according to dictionaries and corpora. Their use frequency rankings and the corpus token frequencies are as shown in (9).¹⁾

(9) a. Frequency ranking:

nwun 'eye':	107th	pota 'to see':	17th
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b. Token frequency:

nwun 'eye':	15,000	pota 'to see':	28,700
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The statistics in (9) show that the verb is far more frequently used than the noun, as plainly shown in the frequency ranking and the token frequency. However, as will be made clear in the subsequent discussion, the participation in the construction formation is far more active with the noun than with the verb, a fact applicable to other perception categories as well.

There are numerous instances where the 'eye'-constructions make reference to cognitive functions. The statistics by the category of cognitive functions and the examples are as shown in (10). For the purpose of comparison between the physical and non-physical uses, the number of constructions that are purely used for physical senses is also provided.

1) The frequency rankings are based on the frequency list of National Academy of the Korean Language (2002), and the token frequency counts are based on the KAIST KORTERM Corpus as accessed in February 2005. Some of the statistical figures are projected based on sub-samples for the lack of precise semantic and part-of-speech tagging in the corpus. The frequency count of *nwun* is based on a projection from sub-sampling, because the corpus does not make use of a semantic tagging that separates different senses in polysemy (between 'eye' and 'snow' in this case).

(10) Reference to Cognitive Functions and Psychological States by the
'Eye'-Constructions

Category	No. of Constructions	Example		
		Form	Meaning	Literal Meaning
interest	45	nwunkilul ponayta	to show interest	to send eye path
emotion	40	nwuney palphita	to be emotionally disturbed	to be trodden in the eye
cognizance	31	ponun nwuni issta	to have expertise	to have eyes to see with
dominance	22	nwunkilul kamtanghata	to endure attention	to endure eye path
taste	16	nwunkkoli sita	to be unhappy with	to have sour eye-shape
cogitation	15	nwuni ppita	to have erratic prejudice	to have sprained eyes
personality	9	nwuni yelita	to be easily affected	to have tender eyes
[Physical]	79	nwunkilul cwukopatta	to exchange mutual interest	to exchange eye path
Total	257/200 ²⁾			

Similarly pota 'to see' by itself has derived meanings that depart from the original meanings, as is well illustrated in (11).

(11) Reference to Cognitive Functions and Psychological States by
'See'-Constructions

Category	No. of Constructions	Example		
		Form	Meaning	Literal Meaning
Cogitation	25	nappukey pota	to regard sth. as bad	to see badly
Acquisition	19	awulul pota	to have a younger sibling	to see a younger sibling
Emotion	11	kangkenne pwul potus	to be indifferent	to see fire across the river
Dominance	7	yathcapa pota	to belittle	to see lightly
Cognizance	4	molla pota	to fail to recognize	to see unknowingly
Management	3	cipul pota	to housekeep	to see a house
[Physical]	8	macwu pota	to face vis-a-vis	to see in a facing manner
Total	77			

What can be inferred from the statistics given in (10) and (11) can be summarized in three points. First of all, our construal of our eye-related activities is such that eyes/eye-sights are among the ways to show our interest, emotion, and

2) The statistical discrepancy, i.e. the summative 257 and the total of 200, is due to the fact that some constructions have multiple memberships. This applies to the multiple figures presented with a virgule (/) in other tables.

dominance-relation in inter-personal relationship. Secondly, We construe that they relate to cognitive functions such as cognizance and cogitation. I.e., eyes and eyesights (the latter as designated by the verbal event of viewing, *pota* 'to see') are viewed as a window to our recognition of the world affairs and active understanding or reasoning processes about what we experience. Finally, we construe that a person's affective states, or even his or her personality can be judged through the features of the eyes.

3.2 Ears

The terms denoting 'ear' are important sources of grammaticalization across many languages. For example, EAR grammaticalizes into locative marker 'region around the corner', 'at', 'toward', etc.; and temporal marker 'at', 'towards', 'around the time of'. However, HEAR and LISTEN have no attested grammaticalization in the grammaticalization lexicons such as Heine et al. 1993, Heine & Kuteva 2002, etc.

A survey of the Korean language shows that there are 54 'Ear'-Constructions and 19 'HEAR/LISTEN'-Constructions. The frequency ranking and the token frequency are as in (12).

(12)a. Frequency ranking:

kwi 'ear':	840th	tutta 'hear/listen':	88th
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b. Token frequency:

kwi 'ear':	2,063	tutta 'hear/listen'	8,100
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As was indicated earlier, with the discussion of the 'eye'-constructions, the use frequency of the verb exceeds by far that of the noun. However, also as was the case with the 'eye'-constructions, the participation in construction formation is more actively observed with the noun than with the verb, as will be made clear in the statistics presented below.

The semantic categories of the constructions and the number of constructions along

with examples are as shown in (13) and (14).

(13) Reference to Cognitive Functions and Psychological States by the 'Ear'-Constructions

Category	No. of Constructions	Example		
		Form	Meaning	Literal Meaning
Interest	12	kwika solkishata	to get interested in	to have a reclining ear
Cognizance	10	kwiey ikta	to be familiar	to be familiar to ears
Cogitation	7	kwika ttuita	to comprehend	for ears to be opened
Dominance	5	kwiey mos pakhita	to control/tell excessively	for ears to become callous
Acquisition	2	kwitongyangu hata	to learn incidentally through overhearing	to beg by the ears
Taste	2	kwiey kesullita	to dislike	to go against grain at ears
[Physical]	20	kwika celpyekita	to be unable to hear	for ears to be a cliff
Total	58/54			

(14) Reference to Cognitive Functions and Psychological States by 'Hear/Listen'-Constructions

Category	No. of Constructions	Example		
		Form	Meaning	Literal Meaning
Cogitation	10	kwitama tutta	to pay attention to	to listen filling into ears
Acquisition	4	kkwucwungul tutta	to be reprimanded	to hear a scolding
Cognizance	2	ete tutta	to know through overhearing	to hear for free
[Physical]	5	cansolilul tutta	to be nagged at	to hear small sounds
Total	21/19			

As is clear from the statistics, some of the noteworthy observations from 'ear' and 'hear/listen' can be summarized as follows: As compared with the case of 'eyes', the body-part 'ear' and its related 'hearing' function, though less frequently used than 'eyes/eye-sights', are construed as showing the interest, as the most frequent non-physical meaning. 'Ears' and 'hearing' are also construed as a channel of cognitive functions such as cognizance and cogitation. It is understandable because the human cognitive functions are directly affected by the information we gather aurally.

3.3 Nose

From a cross-linguistic perspective, it is often found that NOSE grammaticalizes into locative marker 'in front of' (Heine et al. 1993, de León 1992). Related to the NOSE is BREATH (not BREATHE), which grammaticalizes into reflexive marker (Heine and Reh 1984). It is interesting to note that SMELL has no attested grammatical functions across languages.

In Korean, however, there are 51 'nose'-constructions and 6 'smell'-constructions. This is a big decrease in number from 'eye'-, 'see'-, and 'hear'-constructions, but the decrease is minimal as compared with 'ear'-constructions. The frequency ranking and the token frequency are as shown in (15).

(15)a. Frequency ranking:

kho 'nose': 1,335th naymsaymaththa 'to smell': Not Listed
 naymsay 'smell' 1,061st

b. Token frequency:

kho 'nose': 1,148 naymsaymaththa 'to smell': 146
 naymsay 'smell': 1,700

(16) Reference to Cognitive Functions and Psychological States by the
 'Nose'-Constructions

Category	No. of Constructions	Example		
		Form	Meaning	Literal Meaning
Emotion	12	kholul ppattulita	to be depressed	to have the nose fall
Dominance	11	kholul kkweyta	to be enslaved by	to have the nose pierced
Cogitation	1	khoaphakkey mos pota	to be near-sighted	to see only the tip of the nose
Personality	1	khoka nophta	to be arrogant	to have a high nose
[Physical]	28	khoka makhita	to have a stuffy nose	to have the nose blocked
Total	53/51			

(17) Reference to Cognitive Functions and Psychological States by
'Smell'-Constructions

Category	No. of Constructions	Example		
		Form	Meaning	Literal Meaning
Cognizance	1	naymsaylul maththa	to discover (mentally)	to smell
[Physical]	6	naymsayka cintonghata	to smell strong odor	for smell to vibrate
Total	7/6			

Among the noteworthy observations about the 'nose'- and 'smell'-constructions in Korean are that 'nose' and 'to smell' are of low cognitive salience; that 'nose' is construed as having relations with emotion and dominance, whereas smelling (from 'to smell') is almost exclusively used for a description of a physical event; and that both 'nose' and 'top smell' largely refer to physical functions and states.

3.4 Mouth

From a cross-linguistic point of view, MOUTH has been attested to have grammaticalized into locative markers 'in front of', 'at', 'in', 'side', 'edge', etc. (Heine et al. 1993, Heine and Kuteva 2002). On the other hand, the related term, TASTE, grammaticalizes into perfect marker (experiential perfect). Further, SPEAK and SAY show a very rich inventory of grammaticalized markers: they grammaticalize into cause clause marker, complementizer, conditional marker, evidential marker, purpose clause subordinator, quotative, simile conjunctive, and subordinator. In fact, SPEAK and SAY are among those that grammaticalize into complementizers (Hopper and Traugott 2003[1993], Lord 1976, Frajinier 1996, inter alia).

Korean 'mouth' has 63 constructions but 42 of them, a large majority, refer to the speaking function rather than the gustatory function, and only 21 of them refer to the gustatory function. Korean 'tongue' has 21 constructions, 11 of which refer to the speaking function and 10 of which refer to the gustatory-related function. Korean 'taste' has 23 constructions, all referring to gustatory-related function. The frequency ranking and token frequency are as shown in (18).

(18)a. Frequency ranking:

ip 'mouth': 338th hye 'tongue': 2,260th maspota 'to taste': 3,275th

b. Token frequency:

ip 'mouth': 8,185 hye 'tongue': 900 maspota 'to taste': 191

(cf. mas 'taste' [noun]: 890)

One aspect to be noted is that the verbal expression *maspota* 'to taste' was a phrase in its origin as *mas-ul pota*, literally, 'to see the taste', where the nominal *mas* occurred as a theme argument of the verb *pota* 'to see'. Therefore, the token frequency of *maspota* alone does not fully represent the frequency of the verbal expression 'to taste': some of the uses of the nominal *mas* (whose token frequency was 890) actually belong to the verbal expression 'to taste' as occurring without the deletion of the accusative case marker *-ul*.³⁾

The instances of references to cognitive functions and psychological states denoted by the 'mouth'-constructions are as shown in (19).

(19) Reference to Cognitive Functions and Psychological States by the 'Mouth'-Constructions

Category	No. of Constructions	Example		
		Form	Meaning	Literal Meaning
Emotion	11	ipul ppicwukita	to show discontent	to pout the mouth/lips repeatedly
Dominance	2	ipuy hyekathta	to be extremely submissive	to be like the tongue in the mouth
Taste	2	ipi ccalpta	to be peculiar in taste	to have a short mouth
[Physical]	7	ipey phwulchilhata	to make a minimal living	to apply paste to mouth
Total	22/21			

Likewise, the statistical data of the references to cognitive functions and

3) Largely depending on the level of preservation of the original structure, there are variations as to orthographic spacing, i.e., *masul pota* vs. *mas pota* vs. *maspota*, in the descending order of the level of preservation.

psychological states by the 'tongue'-constructions are as shown in (20).

(20) Reference to Cognitive Functions and Psychological States by the
'Tongue'-Constructions

Category	No. of Constructions	Example		
		Form	Meaning	Literal Meaning
Emotion	6	hyelul chata	to show sympathy	to kick the tongue
[Physical]	4	hyelul nalluntayta	to dart the tongue in and out repeatedly	to dart the tongue in and out repeatedly
Total	10			

From a comparison of the 'tongue'-constructions with the 'mouth'-constructions, an interesting aspect emerges. Even though 'mouth' and 'tongue' are closely related, even to the degree that the function of the tongue in a strict sense is often considered as that of the mouth, the 'tongue'-constructions are far fewer than the 'mouth'-constructions and even the semantic category types are impoverished, with a single category of emotion-meaning.

The constructions from the verbal 'to taste' show some, though extremely limited, non-physical semantics as shown in (21).

(21) Reference to Cognitive Functions and Psychological States by
'Taste'-Constructions

Category	No. of Constructions	Example		
		Form	Meaning	Literal Meaning
Emotion/ Cognizance	23	kothongul maspota	to experience pain	to taste the pain
Total	23			

From the foregoing statistics and descriptions, the following observations emerge as noteworthy. First, 'mouth' and 'tongue' are construed as primarily having relations with the speaking function, rather than the gustatory function. Second, 'mouth' and 'tongue' are construed as having cognitive relevance to emotion. However, 'taste' is exceptional in that all the 'taste'-constructions uniformly make reference to

emotion/cognizance, specifically, experience which leads into the knowledge states of the experiencer. No 'taste'-constructions have been found to refer to their more conservative, i.e. physical, aspects. This makes a contrast with other cases where such conservative, literal meanings are either more predominant (e.g. 'smell'), balanced (e.g. 'nose', 'ear'), or at least surviving (e.g. 'see', 'hear/listen').

3.5 Four Organs Compared

The nouns designating the four sensory organs and the verbs that denote the events associated with such body-part organs have been discussed in the preceding sections. For a better vista of the general picture, those four domains may be compared as a whole.

The frequency rankings of the four categories can be tabulated as in (22).

(22) Frequency Rankings Compared

Sense Category	Average Ranking	Linguistic Forms	Frequency Ranking
Visual	62nd	nwun 'eye'	107th
		pota 'to see'	17th
Auditory	464th	kwi 'ear'	840th
		tutta 'to hear/listen'	88th
Olfactory	1,198th	kho 'nose'	1,335th
		naymsay(mathhta) 'smell'	1,061st
Gustatory	1,957th	ip 'mouth'	338th
		hye 'tongue'	2,260th
		maspota 'to taste'	3,275th

From the frequency statistics, we can see that visual perception words are the most frequent, and the auditory, olfactory, and gustatory perception words in the descending order of frequency. The average itself hides many aspects, such as the statistical disparity between the nominals and the verbals, and inclusion of irrelevant semantics in polysemy as prominent in the case of 'mouth' that has multiple meanings. For example, as noted elsewhere, the term for mouth, i.e. *ip*, is polysemous with

non-perceptual meanings, and therefore, the inclusive ranking of *ip* 'mouth' is bound to skew the statistical significance.⁴⁾ However, all things considered, the general hierarchy of the sense domains in human perception, as revealed in the language use, is well illustrated by this order of use frequency.

A comparison of the numbers of construction types classified according to their semantic categories is also promising as it helps us understand the relative semantic distributions among the four sense categories. It will show, for example, which perceptual categories are more closely related to which cognitive categories, and reversely, which perceptual categories are least closely, or never, related to which cognitive categories. This will also allow us to find out about the differences along the part-of-speech variables relative to other perceptual categories, even though we have briefly touched on the issue briefly in the preceding discussion within the particular perceptual categories.

The number of construction types is as shown in (23).

(23) Number of Constructions by Semantic Types

Semantic Category	Visual		Auditory		Olfactory		Gustatory		
	eye	to see	ear	to hear	nose	smell	mouth	tongue	to taste
Cognizance	31	4	10	2		1	1		
Cogitation	15	25	7	10	1				
Emotion	40	11			12		11	6	23
Dominance	22	7	5		11		2		
Taste	16		2				2		
Interest	45		12						
Personality	9				1				
Acquisition		19	2	4					
Management		3							
[Physical]	79	8	20	5	28	6	7	4	
Total	257/200	77	58/54	21/19	53/51	7/6	22/21	10	23

A relative token frequencies of the perceptual terms as taken from the KAIST KORTERM Corpus is as shown in (24).

4) It is to be noted that even though the inclusion of polysemous meaning of *ip* 'mouth' raises the frequency ranking, the general ranking is not affected since the gustatory terms rank the lowest anyway.

(24) Token Frequency of Perceptual Terms by Part-of-Speech Categories⁵⁾

Sense Category	Linguistic Forms	Token Frequency	Total Token Frequency
Visual	nwun 'eye'	15,000	43,700
	pota 'to see'	28,700	
Auditory	kwi 'ear'	2,063	10,163
	tutta 'to hear/listen'	8,100	
Olfactory	kho 'nose'	1,148	2,994
	naymsay(mathhta) 'smell'	1,846	
Gustatory	ip 'mouth'	8,185	9,266
	hye 'tongue'	191	
	maspota 'to taste'	890	

From (23) and (24) we see many interesting aspects with reference to the relative primacy of the four perceptual domains, and their uses with respect to human cognition. The organization in the macro-structure shows that the use of visual perception expressions in terms of their diversity in construction, their use frequency, and the sheer number of use tokens is by far predominant. The uses of the auditory and olfactory expressions in constructions occur in that order of frequency in terms of their cognitive meaning creation, with only a narrow margin between the two. However, their pure token frequencies show a wide gap at the ratio of about three to one.

On the other hand, gustatory expressions in constructions are of the lowest in richness, even though their token frequency is higher than the olfactory expressions due to the fact that the body-parts associated with the gustatory perception have non-perceptual functions such as the speaking functions, as has been noted earlier.

A comparison between the nouns and verbs, as illustrated in (24), shows that, generally, the verbs denoting biological functions of perception have the higher

5) A caveat as to the interpretation of this statistical data is that the vast majority of the 'mouth' term uses are non-gustatory, i.e. speaking, function. From a cursory investigation from the corpus data, the uses of gustatory semantics with *ip* 'mouth' are extremely low. Thus, the general frequency ranking between Olfactory and Gustatory categories remains statistically undetermined, even though it is suspected that the gustatory frequency ranks lower than the olfactory frequency. (See discussion in 3.4.)

frequency ranking in use than the nouns corresponding to those functions, except for the 'mouth' term for reasons discussed elsewhere, whereas the nouns, as shown in (23), are more commonly recruited to form the constructions making reference to cognitive functions.

From a more micro-scopical analysis of the given data, we see that the visual terms have diverse cognition-related semantics, with 'emotion', 'interest' and 'cogitation' surfacing as the most prominent. It is noteworthy that the verb *pota* 'to see', when participating in the constructions, is most frequently used for cogitation meaning, i.e. reasoning, comprehension, or thinking.

The nominal olfactory term, i.e. *kwi* 'ear', is most frequently used for cognizance, i.e. recognition, and interest. This must be attributable to the fact that the auditory perception directly triggers recognition of entities or facts and arouses our interests. Overall, the auditory terms, both the noun and the verb inclusive, most frequently make reference to cogitation, which also suggests that human cogitation process is deeply affected by what we hear, a fact similar to the case of visual perception.

The use of olfactory verb in constructions is extremely minimal. However, the olfactory noun, i.e. *kho* 'nose', is used for 'emotion'- and 'dominance'-related semantics. This seems to be attributable to the fact that the human emotion is closely related to the human posture (cf. 'orientational metaphor': Lakoff and Johnson 1980), and the human face is the primary body-part with respect to human posture. As the nose is the most prominent facial body-part in terms of configurational contour, by virtue of its being most protruding body-part among those located on the face, it is affected to the highest degree by the location or the movement of the head, the location of which being high or low is directly linked to the person's emotional state. Therefore, the location of the nose is considered indexical to the person's emotion. Since dominance-relationship deeply affects a person's emotion, it comes as no surprise that the nose can make reference to the interpersonal dominance-relationship.

The gustatory expressions, though generally impoverished in the level of their participation in construction formation, are most frequent in 'emotion'-related meanings. This has to do with the fact that human emotion is often equated with the

taste, either metaphorically or literally.

4. Conclusion

This paper attempted to compare the four sensory organs and their related linguistic expressions in order to identify the relationship between the physical perception and human cognition.

Among the observations to be recapitulated are (i) that human body is construed as having a close relationship with the human cognition; (ii) that the terms denoting the perceptual organs examined here are more diversely used in forming constructions referring to human cognition rather than their unique biological functions; (iii) that the visual perception is considered to have the highest salience value for human cognition; (iv) that the verbs denoting biological functions of perception have the higher frequency ranking in use than the nouns corresponding to those functions; and that (v) the nouns, however, are more commonly recruited to form the constructions making reference to cognitive functions.

The body and cognition are undoubtedly closely related and this fact is plainly manifested in language. Since this inevitable relationship is hypothesized to have a universal validity, it is expected that similar phenomena are found in other languages. As a matter of fact, a subsequent research work by Eom (2005) indeed presents findings in English that are similar to the Korean states of affairs, with some differences in detail. Further cross-linguistic research should help us understand the nature and the limit of the universality across languages and idiosyncrasies of individual languages.

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