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# Olfaction in a hunter-gatherer society: Insights from language and culture

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## Abstract

According to a widely-held view among various scholars, olfaction is inferior to other human senses. It is also believed by many that languages do not have words for describing smells. Data collected among the Maniq, a small population of nomadic foragers in southern Thailand, challenge the above claims and point to a great linguistic and cultural elaboration of odor. This article presents evidence of the importance of olfaction in indigenous rituals and beliefs, as well as in the lexicon. The results demonstrate the richness and complexity of the domain of smell in Maniq society and thereby challenge the universal paucity of olfactory terms and insignificance of olfaction for humans.

**Keywords:** olfaction; language of perception; smell terms; Maniq; Aslian.

## Introduction

For centuries, great thinkers and scientists have underestimated the sense of smell in humans. Olfaction is often singled out as the least useful perceptual sense, whose role in life is negligible. “Of all the senses it is the one which appears to contribute least to the cognitions of the human mind” (Condillac, 1754/1930, p. xxxi). Darwin (1874) deemed it to be “of extremely slight service” (p. 17), while to Kant (1798/2006) it appeared as “the most dispensable” (p. 50) of the senses. It has also been claimed that olfaction is of “little special value across cultures” (Gardner, 1993, p. 61) and that man “has left the world of smells” (Burton, 1976, p. 109). Neuroscientists have expressed the belief that smell is insignificant for humans and that, in fact, it is “extremely rudimentary” (Grinker, 1934, p. 313), vestigial (Pinker, 1997), or as Stanley-Jones (1957) phrased it, the human rhinencephalon is “untenanted” (p. 594).

Hand in hand with these ideas came the popularization of the belief that olfactory language is impoverished. Dan Sperber (1974/1975), a co-author of the cognitive approach to communication known as Relevance Theory, wrote:

Even though the human sense of smell can distinguish hundreds of thousands of smells and in this regard is comparable to sight or hearing, in none of the world’s languages does there seem to be a classification of smells comparable, for example, to colour classification.... There is no semantic field of smells. (pp. 115–116)

According to Henning (1916), “olfactory abstraction is impossible” (p. 66), while Kant (1798/2006) remarks on a

margin of his manuscript: “Smell does not allow itself to be described, but only compared through similarity with another sense” (p. 51).

In spite of the fact that smell is either devalued or ignored in the accounts of many fields of science, there is a growing body of literature which attempts to bring to the fore the importance of smell across cultures (e.g. Classen, Howes, & Synnott, 1994). However, to date there are relatively few studies providing detailed descriptions of olfactory vocabularies in various languages. The current article is intended as a contribution to filling that gap by providing a description of the olfactory lexicon in the language of the Maniq, a group of nomadic hunter-gatherers living in southern Thailand. At the same time, it adds to the knowledge on olfaction of the larger linguistic group of Aslian (belonging to the Austroasiatic family), which is a locus of considerable olfactory elaboration in the cultural and linguistic realm (Burenhult & Majid, 2011). The Maniq data challenges the view that olfaction is of little value to humans as well as the idea that olfactory lexica are necessarily impoverished and lacking in abstract terms. This is important evidence, since the generalizations cited earlier are made primarily on the basis of WEIRD (Western, Educated, Industrialized, Rich, Democratic) communities (Henrich, Heine, & Norenzayan, 2010) and we know that even apparently basic processes such as visual perception may vary across populations (Segall, Campbell, & Herskovits, 1966).

In order to give as comprehensive account as possible of the complex domain of smell in the Maniq language and culture, the topic was explored with the use of multiple methods: ethnographic observation and interview, linguistic elicitation and experimentation. We begin by providing a cultural background to the role of olfaction in the beliefs and practices of the group. We then go on to discuss Maniq smell terminology and, finally, turn to the analysis of speakers’ similarity judgments of Maniq smell terms with the use of multidimensional scaling.

## The Maniq and their Language

Maniq [ma’niʔ] is spoken by 240-300 people living in scattered groups in the Banthad mountain range of southern Thailand (more specifically, in Trang, Satun and Phatthalung provinces). Maniq people belong to the larger ethnographic cluster of Semang with a traditionally mobile lifestyle and hunter-gatherer mode of subsistence. Despite

on-going deforestation and pressure towards sedentism, many Maniq are still nomadic and continue to hunt animals and forage wild plants. Their economy is further supported by income from tourists and small-scale exchange of forest produce. Maniq language belongs to the Northern Aslian branch of Aslian, which forms part of the Austroasiatic family.

### Indigenous Beliefs and Practices

Smell offers a heuristic method of making judgments about odor-emitting sources. Whether to approach something or stay clear of it might depend on the olfactory input one gets from the environment. This function of olfaction is said to be basic for all humans and is believed to be tightly related to the fact that we perceive and categorize smells according to their pleasantness (Yeshurun & Sobel, 2010).

There are numerous examples of odors in the Maniq world which have very clear associations in terms of whether their source is desirable or not. The Maniq make constant use of this information in a variety of contexts – ranging from everyday foraging activities, through indigenous medicine to the ritualized uses of scents. This section explores a number of instances which reflect the relevance of odor in the beliefs and practices of the tribe.

A large number of medicinal herbs collected by the Maniq have intense aromas, the majority of which can be described by the term *lspəs* ‘to be fragrant’. Exemplars include: *kasay* ‘*Dianella ensifolia*’, *kupit* ‘turmeric (*Curcuma domestica*)’, *biha* ‘*Triomma malaccensis*’ and *p<sup>h</sup>ley* ‘Cassumunar ginger (*Zingiber montanum*)’ (from Thai *phlai*). The fact that pleasing odors and healing or disease-preventive powers come together in a sizeable group of plants seems to be perceived not as a coincidence, but instead speakers perceive a causal relationship between them. A Maniq woman asked whether a rhizome of the cassumunar ginger she wore in a necklace protected her against illness answered affirmatively adding *ʔeʔ lspəs* ‘it is fragrant’. This links to an idea found among the closely-related Aslian groups (e.g. Jahai, Batek), namely that on some occasions odor is believed to be the curing agent of medicine (Burenhult & Majid, 2011; Endicott, 1979).

The beneficial properties of aromatic herbs extend beyond health-protective talismans such as necklaces, headbands and wristbands. A good example of this is the plant called *kasay* ‘*Dianella ensifolia*’, whose roots are ‘burnt in fire during windstorms’ (*tət buwaʔ ʔeʔ hayhəy*) in order to appease the wind (cf. the use of *kasay* and other fragrant plants during thunderstorms among some Aslian groups; Dallos, 2011; Endicott, 1979). At the same time, *kasay* is a multi-purpose medicine which apart from being boiled in water and used to treat stomachache is also burnt in fire in order to produce smoke to be inhaled by the sick.<sup>1</sup>

The Maniq do not offer detailed explanations of how

<sup>1</sup> The latter practice was used by a man whose condition (immobilizing pain in the legs) was attributed to the ‘soil spirit’ (*tames tieʔ*).

smoke counters disease or wind, but considering how frequently the term *lspəs* is mentioned in such contexts one can be confident that smell plays an important role. A valuable insight into understanding these practices can be gained from the description of a similar act (blowing incense smoke on the body of a sick person) performed by the Batek:

The smoke is supposed to enter the body and cause the disease to flee. This is because the odour of the smoke is good (*bed’ət*) and that of the disease bad (*jebéc*), and they cannot mix. If the smoke goes in, the disease must leave. Alternatively, some say the good-smelling smoke draws the disease out of the body by attracting it, causing it to follow the smoke as it wafts upward from the patient's body. (Endicott, 1979, pp. 107-108)

Another situation in which a good-smelling smoke is used for fighting against a bad force is perhaps one of the most salient and common Maniq rituals of ‘burning animal hair’<sup>2</sup> (*tət sək ʔay*) and ‘bones’ (*ʔiyey*). It is performed on hot days when the sun has a yellow color and when it releases the characteristic smell *hamis*<sup>3</sup>. *Hamis* descends into the forest and spreads around causing illness among the people. Maniq, like other Semang (Benjamin, 1985; Endicott, 1979; Lye, 2004), believe that a cool and shaded environment is healthy and provides protection against disease. Exposed locations without too many trees, on the other hand, are dangerous since the sun heats people’s bodies and turns their eyes red. At such moments, the shelters provide safe refuge from both the heat as well as the malicious *hamis*. Burnt animal hair and bones give off a pleasant smell, *caŋes*, which together with the smoke floats up to the sun and neutralizes *hamis*. This belief is a vivid illustration of how much power is attributed to odor in that it can have direct physical effects on the human body and the sun. Yet, people can actively defend themselves by releasing good odors thus forcing out harmful ones and bringing a balance to their immediate environment.

Smells are held as projections of their sources which can directly affect the human body or the environment. As Classen (1993) puts it noting the same phenomenon in a number of cultures across the world, “Involved here is the notion of odor as ‘essence’, containing the intrinsic identity of its source of origin” (p. 99). By this token, according to the Maniq viewpoint, invasive and dangerous odors constitute danger while benevolent ones can be employed as cures and defense mechanisms.

### Language of Olfaction

The cultural importance of olfaction is accompanied by a remarkably complex set of odor distinctions in the language.

<sup>2</sup> Burning hair (though in this case, it is human hair) is reported to be another thunderstorm-appeasing practice among the Batek, Lanoh and Temiar (Dallos, 2011; Endicott, 1979).

<sup>3</sup> The Batek, too, believe that the sun has an unpleasant odor (*pel’əng*) (Endicott, 1979).

These provide additional support for the claim that the domain of smell is of special value for Maniq society.

### Smell Terminology

In this section, we discuss the main Maniq smell terms. Twelve of these were elicited in a free naming task using “Sniffin’ Sticks” (Hummel, Sekinger, Wolf, Pauli, & Kobal, 1997), where Maniq speakers described different odor stimuli. Due to space limitations, the results of that task will not be reported here. Three additional terms (*paleŋ*, *caŋə*, *caŋes*) were attested during other language elicitation sessions.

In order to move towards understanding the meaning of the smell terms, an exemplar listing task was conducted with the speakers. In this task, consultants were presented with smell terms, one by one, and asked the question “What smells x?”. Participants were free to list as many exemplars as they wished. The task was carried out in Maniq. Table 1 lists the terms together with their exemplar sources elicited from 8 speakers. Numbers in brackets next to each exemplar indicate the number of consultants who gave that response. Six participants contributed responses to the entire (or almost entire) set of smell terms whereas 2 speakers commented on a limited number of terms while another participant was being interviewed. All data is taken into account, though in situations where one of the speakers repeated the response heard from another speaker, it is counted only once. Most plants were identified with the help of Maneenoon (2001). It was not possible to identify some of the plant and animal species – these are given in square brackets.

Maniq smell terms share a number of semantic properties. First, they are dedicated to describing olfactory sensations rather than being general descriptors applicable across sensory domains.<sup>4</sup> Second, they are abstract, meaning that they do not make direct reference to the source of the smell (like e.g. fruity), but rather denote an odor quality. This quality is often a common feature of a range of diverse objects, though examples of terms associated with essentially one referent seem to occur, too (e.g. *hamis*).

Note that some smell terms seem to have clearly identifiable prototypical sources, e.g. *kameh*, *paleŋ*, while others do not have such salient core exemplars, e.g. *mi?* *nətu?*, *mi?* *bayəɔ̃ɔ̃*. On the whole, unique listings of exemplars are common, which may, to some extent, be an artifact of the listing task, or the small number of participants. It may also be indicative of a certain amount of subjectivity in the understanding of smell terms, but this is not clear at this point.

Another important aspect of odor terminology in Maniq is its presence in everyday conversation. The smell lexicon does not consist of specialist terms known to a limited group of people, nor is it restricted to particular contexts or

Table 1: Maniq smell terms with their corresponding exemplars. Numbers in brackets indicate the number of consultants who listed that exemplar. Unidentified animal and plant species are given in square brackets.

Term	Exemplars
caŋə	tubers ( <i>Dioscorea</i> spp.) (4), food (2), cooked meat (2), rice (1), pork (1)
caŋes	animal hair (2), burnt animal hair (2), burnt animal fat (1), sun (1)
caŋus	soap (3), washing oneself (2), fruit ( <i>Goniothalamus</i> sp.) (1), leaves (1), [kind of fruit] (1), clothes (1), talcum powder (1), sun (1)
hamis	sun (6), air/smoke coming from the sun (2)
haʔit	rotting animal (4), animal (1), plantain squirrel ( <i>Callosciurus notatus</i> ) (1), Prevost’s squirrel ( <i>Callosciurus prevostii</i> ) (1), [kind of squirrel] (1), bats (1)
kameh	[kind of millipede A] (5), [kind of millipede B] (1), [kind of millipede C] (1), ipoh poison (1), [kind of bat] (1), forest (1)
kamloh	smoke from fire (3), old shelter (1), bathing (1) tubers ( <i>Dioscorea</i> spp.) (3), bearcat ( <i>Arctictis binturong</i> ) (2), new shelter (1), clean and dry clothes (1), fruit ( <i>Ficus chartacea</i> ) (1), forest (1), tree (1), animal (1), food (1), medicine to drink (1)
lspəs	
paleŋ	blood (5), raw meat (1), [kind of plant] (1), searching for tubers (1), sun (1)
paʔəʔ	pouring/getting water (2), tuber ( <i>Dioscorea daunea</i> ) (2), mud (1), digging tubers in mud (1), cooking muddy tubers (1), wet or dirty clothes (1), rotting bamboo tube (1), soil (1), mushroom (1), petai ( <i>Parkia speciosa</i> ) (1), <i>Parkia timoriana</i> (1), sweat (1), urine (1), old shelter (1)
mi?	old shelter (2), soil (2), shelter (1), mushrooms (1), skin of a dead animal (1), rotten wood (1), bamboo for water (1), rotting leaf (1), head of macaque/leaf monkey (1)
bayəɔ̃ɔ̃	
mi?	mushrooms (2), rotten wood (2), rotten mushrooms (1), old shelter (1), animal bones (1), durian seed (1), snakes (1), forest (1), searching for tubers (1), soil (1)
danəw	
mi?	snakes (2), soil (2), searching for tubers (1), digging tubers (1), mushrooms (1), sweat (1), rotten wood (1), walking in the forest (1), making fire (1), smoke (1)
huhūɔ̃	
mi?	soil (2), burning fire (1), [type of fire wood A] (1), [type of fire wood B] (1), [kind of flower] (1), [kind of fruit] (1), mushrooms (1), tree (1), walking in the forest (1)
latiŋ	
mi?	tree sap (1), leaves (1), garlic (1), soil (1), forest (1)
nətu?	

<sup>4</sup> The only exception here is the term *bayəɔ̃ɔ̃* which, apart from describing smell, refers to color – a specific kind of white, e.g. of fog or old individual’s hair.

registers of speech. Talking about smell is a mundane activity which all members of the community engage in on a daily basis. What is more, smell is an important reference point in a number of areas of life, such as medicinal practices and rituals.

Formally, Maniq smell terms can be subdivided into stative verbs and noun phrases. The verbs can take verbal affixes, though most frequently they do not bear any morphology (excluding the apparent frozen morphology in *ls-pəs*, where the initial half-syllable has the shape of the iterative affix). A few of the verbs, namely *caŋes*, *caŋus* and *caŋə*, apart from being close semantically, are phonologically similar. They do not, however, show evidence of a productive derivational relationship.

As for the noun phrases, all of them are headed by the noun *mi?* ‘smell’. They appear to be lexical noun phrases since none of the modifiers, with the exception of *bayɔ̃p*<sup>5</sup>, occurs outside of the “mi?+...” phrase. For that reason, it is rather difficult to establish the word class affiliation of these modifiers, though elicited aspect-inflected forms for three of them (*danɔw*, *latiŋ* and *ŋətu?*) suggest that they might be verbs.

All of the above terms serve as phenomenon-oriented descriptions. The controlled activity of smelling as well as the uncontrolled experience of perceiving smell are both expressed by the verb *ɔ̃ŋ* ‘to smell’. It is worth noting that the Maniq *ɔ̃ŋ* forms a clear and distinct category uniquely relating to olfaction with no extensions into other sense modalities.

### Organization of the Smell Lexicon

Taking into account the large number of smell terms as well as the considerable range of exemplars associated with most of them, it is unclear what principles might underlie the organization of the smell lexicon. One way of gaining insight into that organization is to investigate the relationships between the smell terms by collecting similarity judgments from speakers, following a similar procedure used to study color lexica (Shepard & Cooper, 1992). Since the Maniq are a non-literate community, this task was carried out with the use of the triadic comparison method, which does not require reading. Following data collection, the results from 11 Maniq speakers were pooled together to create a similarity matrix analyzed with multidimensional scaling analysis.

### Stimuli and Method

Stimuli for the experiment were the 15 smell terms given in Table 1. The experiment was based on the triadic comparison method as discussed by Weller and Romney (1988). A complete triad test with 15 items would involve 455 triads, which would be time-consuming and tiring for

participants. For that reason, we have used a balanced incomplete block design ( $\lambda=1$ ) of 35 triads. The letter  $\lambda$  represents “the number of triads in which each pair of items occurs” (Burton & Nerlove, 1976, p. 249). To increase the reliability of the design without adding more triads, we followed the recommendation of Burton and Nerlove (1976) to administer two different triad compositions, with each composition randomly presented to half of the participants. Smell terms were randomly assigned a number and the triads were created following the directions of Burton and Nerlove. The only modification of Burton and Nerlove’s design was the randomization of the order in which triads were presented – items were randomized within and across triads to avoid frequent repetition of terms in close proximity.

### Participants

The participants were 11 Maniq speakers (6 male, 5 female) aged approximately 20-45 years. All were native speakers of Maniq, who also had a good command of Southern Thai, the unrelated majority language of the region.

### Procedure

Each participant was tested individually. The task was run exclusively in Maniq to preclude the influence of Southern Thai. Speakers were orally presented with 3 smell terms at a time and asked the following question: “Which one is not the same/similar?” (the meaning of the Maniq term *min*, from Thai *měuan* ‘same, similar’, has scope over both sameness and similarity). The response was coded on a response sheet and the next triad was presented until all triads were complete.

In order to ensure that the task was proceeding as intended, a series of precautions were taken. Before starting the task, the researcher informed the participants that they would be presented with words relating to smell. The critical question “Which one is not the same/similar?” was used each time with the initial triads to make sure the participants remembered what they were asked to do. As they became accustomed to the task, the question was repeated every few triads. Three objects (three similar leaves from the same plant) were placed in a row in front of the consultants to act as anchors to the words in the triad. In order to avoid a situation in which a consultant fell into a response set, words were assigned to objects sometimes from right to left and sometimes from left to right. When presenting a triad, target words were pronounced slowly several times with neutral intonation, unless a consultant gave a response immediately after hearing the triad once. Many consultants responded with the following phrases: “These are together” and “This one is alone” or “These are similar” and “This one is not similar”. In case of any uncertainties on the side of the speaker or the researcher, the triad was read out again and the question was repeated. On the rare occasions when the consultant could not make a choice after being asked the question several times, the researcher proceeded to the next triad and came back to the

<sup>5</sup> *Bayɔ̃p* is a stative verb occurring in a variety of syntactic contexts with a number of verbal affixes. Note, however, that whenever the word is used to denote smell, it occurs in the nonderived form.

problematic one at the end. All participants were able to complete the study.

## Results and Discussion

A 15x15 similarity matrix was constructed by summing over all participants the number of times each pair of smell terms was judged similar. The matrix served as input into the scaling procedure carried out with the use of the PROXSCAL algorithm in SPSS. The resulting two-dimensional solution yielded a stress value (Stress-I) of .098, a dispersion-accounted-for value of .99 and a Tucker's coefficient of congruence value of .995. Figure 1 shows the overall results from all 11 participants.

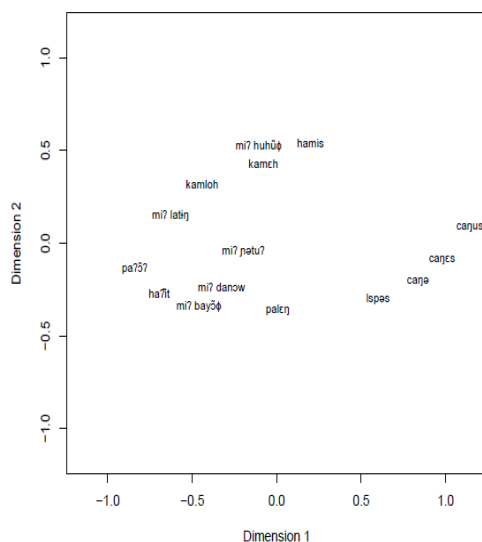


Figure 1: Two-dimensional MDS of 15 Maniq smell terms based on triadic comparison (N=11).

The distribution of smell terms is considerably more stretched on the first dimension. Items are more densely concentrated on the left-hand side, while the right-hand side is more sparsely populated, especially if we look at the almost empty area in the upper right quarter.

The first dimension is readily interpretable as distinguishing between pleasant and unpleasant smell terms, the former located on the right- and the latter on the left-hand side. Though the stimuli were words rather than actual smells, this aspect of the results is comparable with studies using odorants, which report the primary role of the hedonic dimension in smell perception and categorization (e.g. Dubois 2000; Schiffman, Robinson, & Erickson 1977). Pleasantness is also of great importance when considering neurophysiological responses to smells (cf. Yeshurun & Sobel 2010 for an overview) and there is some evidence suggesting this reflects the molecular structure of odorants (Khan et al., 2007).

The interpretation of the second dimension is less straightforward, yet a likely solution is the contrast of edibility vs. inedibility. Items at the bottom are associated

with food objects whereas those at the top are associated with nonfood objects. Again, this aspect appears to reflect odor perception since edibility was found to distinguish odorant samples (Chrea et al., 2004; Zarzo, 2008). An important caveat to this interpretation is that the focus is placed on the smell object rather than the smell quality itself. For instance, the terms *pələŋ* or *haʔit* refer to raw or rotting animal meat, which are not edible within this community. Nevertheless, they refer to meat, which is an edible object.

Since many smell terms relate to multiple exemplars, some of which may be edible while others not, we focused on the smell term prototypes, which for the current purposes are defined as items listed by more than 1 speaker. Inspecting the plot, we see that most terms conform to the edibility distinction. All items in the upper part of the plot relate to exemplars which are considered to be inedible by the Maniq, e.g. *miʔ hahuφ* (snakes and soil), *hamis* (sun and air/smoke coming from the sun), *kameh* (millipedes) and *kamloh* (smoke from fire). As for the opposite side, most items link to edible exemplars, e.g. *pələŋ* (blood), *lɔpəs* (tubers, bearcat), yet there are a few terms among whose prototypical exemplars we find inedible objects – *miʔ bayʔφ* (old shelter and soil) and *miʔ danow* (rotten wood). So, there is evidence consistent with viewing Dimension 2 in terms of edibility but a further examination is required to fully establish the facts.

A follow-up study could collect speakers' judgments on various possible semantic parameters, to see which best predicts the attested dimensions.

## Conclusions

This paper illustrates the richness and complexity of the domain of smell in Maniq society. The different methodologies employed provide insights into the smell lexicon, its underlying structure, and the deep cultural significance of different smell categories. Despite the fact that many cultures, especially those which are part of the developed world, are undergoing gradual deodorization, there appear to be a number of societies with a long tradition of vibrant interest in odor (cf. Classen, Howes, & Synnott 1994). As we hope to have demonstrated with this paper, Maniq adds to the literature regarding the special cultural value of smell across the world, and at the same time reinforces our observation that the Aslian-speaking communities of the Malay Peninsula provide a rewarding setting for studying such smell cultures and their linguistic elaboration of the domain (Burenhult & Majid, 2011). Moreover, it highlights the importance of looking beyond WEIRD people in our theories of cognition (Henrich et al., 2010).

Smell is an integral part of the intimate knowledge of the rainforest's fauna and flora shared by the tribe. What is more, for the Maniq, odor has a metaphysical dimension whereby it is treated as the projection of its source able to "act on its behalf". This is illustrated by the wind-appealing ritual involving the burning of *kasay* as well as the

medicinal practices of the group including both curing and prevention (the best example being the emission of smell to ward off the disease spreading with the odor of sun).

Contrary to the view that the language of odor is non-abstract and steeped in metaphors (Henning, 1916; Kant, 1798/2006; Sperber, 1974/1975), Maniq, and its Aslian brethren, possess rich smell vocabularies of over a dozen abstract terms. These terms are known to the whole speech community and are employed in everyday conversation.

Finally, the internal structure of the Maniq smell lexicon is remarkably similar to the dimensions of variance typically found in studies of odor categorization in speakers without an abstract olfactory lexicon. This suggests that odor lexica may reflect a pan-human olfactory space. Further investigation is needed to explore the extent to which olfactory language follows olfactory perception and cognition, and the extent to which perception and cognition might mirror language in the domain of olfaction.

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