

Reduplication and Odor in Four Formosan Languages^{*}

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This paper is a morpho-semantic study of olfactory terms and linguistic expressions for describing odor in four Formosan languages, including Kavalan, Truku Seediq, Paiwan, and Thao, based on the author's firsthand data. It shows that apart from very limited olfactory terms, reduplication is the most common means for manifesting the meaning of '(having) a smell / an odor of X' in these languages. The formation usually involves a prefix which is found similar in these languages, in Kavalan as *su-*, Truku Seediq as *sə-*, Paiwan as *sa-*, and Thao as *tu-*. Two parameters are taken into consideration: first, the selective restriction on the relevant lexical items for the reduplicative construction, and secondly, the reduplicative patterns in each language. It is proposed that the reason why odor is manifested by reduplication is due to its association with both iterative aspects and plurality. Having a smell is a continuing process, and it is mentally perceptible so that there should be enough entities in order to produce a persistent smell. Inspired by experimental studies in psychology on odor recognition and identification, which suggest a poverty of linguistic representation for odor perception, this paper discusses similarities and differences regarding how each language indicates such a meaning, as well as the semantic implications drawn from the comparison.

Key words: reduplication, Formosan languages, smell, odor, olfactory terms

1. Introduction

This paper is a morpho-semantic study on linguistic expressions for odors/smells in four Formosan languages, including Kavalan, Paiwan, Truku Seediq, and Thao, based on the author's first-hand data.¹ These four languages were selected for this particular

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study² because they exhibit similar patterns for expressing notions of odors/smells even though they belong to different subgroups. According to Blust's (1999) subgrouping, Kavalan and Thao, two plains tribe languages, belong to East Formosan and Western Plains subgroups, respectively; whereas Truku Seediq is a dialect of the Seediq language in the Atayalic subgroup; and Paiwan forms a subgroup by itself.

In these languages, odor is manifested by the reduplication of a noun plus a specific prefix. The expression can be schematized as [PREFIX-(REDUPLICATION) X], where X stands for a noun signifying an odorous source. In some languages reduplication of the noun is optional when expressing the meaning. The prefix denoting the meaning of 'have a smell of X' is similar in these languages: *su-* in Kavalan (Li & Tsuchida 2006, Lee 2009a), *sa-* in Paiwan, *sə-* in Truku Seediq, and *tu-* in Thao (Blust 2003). See also Table 1 in §3.

The structure of this paper is organized as follows: first it is recalled that languages generally lack consistent 'basic odor terms', as opposed to 'basic color terms' (Berlin & Kay 1969) which are assumed to exist in languages. Experimental studies in psychology on odor recognition and identification suggest a poverty of linguistic representation for odor perception (Cain 1979, 1982, Engen 1987, Dubois & Rouby 2002, to name a few). Despite missing veridical labels, odors are described through the means of hedonistic judgments (pleasant vs. unpleasant), reference (iconic or indexical), and metaphors (Holz 2007). The English examples include *fantastic* vs. *disgusting* for hedonistic judgments; *it smells like a rose* or *it smells burned* for iconic and indexical reference; and *your perfume smells hot* for being sexy metaphorically. However, these descriptions are confined within a European point of view.

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- (1) Abas Utay (born in 1933, Female, KAVALAN, patRungan village—Hsin-she, Fengpin, Hualien)
 - (2) Buya Batu (born in 1957, Male, KAVALAN, patRungan village—Hsin-she, Fengpin, Hualien)
 - (3) Vedalan (born in 1960, Female, PAIWAN, Paladralan village—Da-she, Sandimen, Pingtung)
 - (4) Alinging (born in 1947, Female, PAIWAN, Kavianan village—Chia-ping, Taiwu, Pingtung)
 - (5) Mulitan (born in 1984, Female, PAIWAN, Pucunug village—Wen-leh, Laiyi, Pingtung)
 - (6) Sakinu Tepiq (born in 1967, Male, PAIWAN, Lalauran village—Hsin-siang-lan, Taimali, Taitung)
 - (7) Tusi Yudaw (born in 1955, Male, TRUKU SEEDIQ, Tkijig village—Chung-teh, Hsiulin, Hualien)
 - (8) Jiro Ubus (born in 1955, Male, TRUKU SEEDIQ, Ciakang village—Hsi-lin, Fenglin, Hualien)
 - (9) Aki Pitay (born in 1935, Female, TRUKU SEEDIQ, Morisaka village—Wan-jung, Wanjung, Hualien)
 - (10) Kilash (born in 1923, Male, THAO, Ita-thao village—Yutse, Nantou)

² We do not exclude the possibility that this same pattern also occurs in other Formosan languages. A broader scope on this topic in other Formosan languages is pending further research.

This paper focuses on reduplication employed as a means for describing odor in some Formosan languages. The topic is explored in terms of two parameters: (1) the selective restriction on the relevant lexical items for the reduplicative construction, and (2) the reduplicative patterns exhibited in each language. Therefore, the data from these languages are presented accordingly, followed by a discussion on the two parameters aforementioned. Finally, this paper takes on the factors of determining categorization and lexicalization for odor, and discusses the semantic implications from the study on olfactory expressions in these languages.

2. Olfaction in language

Olfaction is one of the animate senses unconsciously connected with breathing. Unlike seeing and hearing which can be controlled by will, smelling is less controllable because it comes with breathing. As a consequence, for a normal person olfactory experiences are inevitable.

Breathing occasionally takes in different kinds of odors. Odors come into the nose as physical molecules which then trigger some fundamental cognitive activities, including pleasant/unpleasant emotions, sexual arousal, and past memories. Allan & Burridge (2006:198) state that “smell is one of the most sexy and provocative of the senses. Sexual arousal in most species is triggered by olfactory experiences, and humans are no exception... we prefer the smells of our friends over strangers; different diets cause people to smell differently... different races have different smells.” Therefore, smelling also serves social functions as a way of recognition and identity among different groups.

However, psychological experiments have found that subjects tend to have a poor linguistic repertoire when it comes to describe even the most familiar odor, a phenomenon termed as “tip-of-the-nose” state (Lawless & Engen 1977). Holz (2007:189) provides a neuro-physiological reason for the linguistic poverty of the olfactory lexicon. The parts of the human brain responsible for processing olfactory stimuli are called the limbic system, which is functionally connected with organizing visceral body functions, processing emotional states and dynamics, as well as long term memory (see also Zucco 2007). The weak neural connections between the limbic system and the language processing areas (i.e. Broca’s area and Wernicke’s area) result in a lack of olfactory vocabulary for a language user to properly cope with identification of odorants.

Consequently, languages tend to have few lexical items for describing smells. For example, in English the olfactory terms include *stink*, *stench*, *smell*, *odor*, *fragrance*, *aroma*, and so on. Based on *The Oxford English Dictionary*, Allan & Burridge (2006: 201) point out that “the longer the word has been in the language, the more disagreeable the denotation.” Among the English olfactory terms, *stink* as a verb appeared in the

eighth century, and as a noun in the thirteenth century; *stench* appeared around the ninth century; *smell* in the twelfth century; *odor* in the fourteenth century; whereas *scent*, *perfume*, *fragrance*, and *aroma* appeared from the fifteenth century onwards.

There is also a tendency in language to have more words for disagreeable smells than pleasant ones. This asymmetry in olfactory terms is also reflected in the Formosan languages discussed in this paper.

3. Linguistic expressions for odors in four Formosan languages

In this section the relevant data in four Formosan languages—Kavalan, Paiwan, Truku Seediq, and Thao—are presented, showing reduplication as a common linguistic construction for describing odor. Languages vary in their lexicon regarding olfaction, yet a similar picture starts to emerge along with presentation of the data.³ The following table offers a quick glance:

Table 1

Language	Kavalan	Paiwan	Truku Seediq	Thao
Prefix	<i>su-</i>	<i>sa-</i>	<i>sə-</i>	<i>tu-</i>
REDU-Pattern	full/partial	full	partial	Ca

(Li & Tsuchida 2006, Lee 2009a, Chang 2000, Blust 2003)

3.1 Kavalan

To describe an odor in Kavalan, the prefix *su-* is used plus obligatory reduplication of the attached noun, which stands for the odorant source. The form [SU-X-X] functions as a verbal predicate (Li & Tsuchida 2006, Lee 2009a). Basically anything capable of producing smell can be applied to the formation. According to Lee (2009a), reduplicative patterns in Kavalan are determined phonologically with CVC-reduplicants as the most productive type.⁴ The same principle is applied to the noun following the prefix *su-*.

³ The following are the abbreviations used in this paper which are not included in the Leipzig Glossing Rules (<http://www.eva.mpg.de/lingua/resources/glossing-rules.php>): AF=actor focus; ASP=aspect marker; EPM=epistemic mood; LF=locative focus; LIG=ligature; PM=politeness marker; PTL=particle; RED=reduplicant.

⁴ Lee (2009a) proposes that four reduplicative patterns are found in Kavalan: (1) disyllabic reduplication; (2) monosyllabic reduplication; (3) Ca-reduplication; and (4) lexicalized reduplication. The first two patterns are derived phonologically, where the syllable structure of a base plays a role in determining the pattern. If the first syllable of a base ends with a consonant, so does the reduplicant. If not, then the reduplicant can either be a V for vowel-initial bases,

- (1) su-*ɬum*~*ɬumzaŋ* *qutʰus*-su.
 SU-RED~sweat clothes-2SG.GEN
 ‘Your clothes smell of sweat.’
- (2) mai pa-*qaŋi*-an-su *βanaw* *rima*-su,
 NEG CAUS-good-PF-2SG.GEN wash hand-2SG.GEN
 su-*βau*~*βaut*=*ti*=*isu*.
 SU-RED~fish=ASP=2SG.NOM
 ‘As you didn’t wash your hands properly, you smell of fish.’
- (3) su-su~*sum* na saku *tazian*.
 SU-RED~urine GEN cat here
 ‘There’s a smell of cat’s urine here.’
- (4) su-ta~*taɬ* na *qaβaw* *rəpaw*-su.
 SU-RED~feces GEN cattle house-2SG.GEN
 ‘Your house smells of cattle’s feces.’
- (5) su-təp~*təpu* ʔmay *zau*.
 SU-RED~mold rice this.
 ‘The rice smells of mold.’

Kavalan has two hedonistic olfactory terms: *βaytu* ‘be stinky, stink or unpleasant smell’ and *βaysis* ‘be fragrant; fragrance or pleasant smell’. These two terms denote general unpleasant vs. pleasant odors. The two general terms *βaytu* and *βaysis* cannot be applied to the formation of *su*-reduplication, and the forms **su-βay*~*βaytu* and **su-βay*~*βaysis* are unattested. Besides, there is no lexical item simply meaning ‘odor’ or ‘odorless’ in this language.

The following terms specifically denote certain types of smells: *βayti* ‘the smell of rotten cooked food (i.e. meals, dishes, soup)’, *iŋtuβ* ‘the smell of burned rice’, *ɬaytəs* ‘a fish smell (a natural smell out of fish or sea), blood’,⁵ and *sikət* ‘an underarm smell’. The word *mruaq* as a verb denotes the act of putrefying and as a noun the odor of putrefaction, specifically from that of animals, but not of humans.⁶ See the following examples:

and a CV(C) or CVV(C) for disyllabic or tri-syllabic bases.

⁵ In Kavalan ‘the smell of sea’ is *su-ra*~*raziŋ* < *raziŋ* ‘sea’, which encompasses the smell of any sea plants, such as *su-qa*~*qapiŋ* < *qapiŋ* ‘thick black seaweed, same kind of wrapping of Japanese sushi’ (Li & Tsuchida 2006), or *su-tu*~*tuq* < *tuq* ‘hard black seaweed, soft if marinated’.

⁶ The odor produced from putrefaction of a human is described by the general olfactory term *βaytu*.

- (6) su-βaŋ~βaŋti saraŋ zau.
SU-RED~rotten food smell soup this
'This soup has a rotten smell.'
- (7) su-iŋ~iŋtuɁ ʔmay-su.
SU-RED~burned rice smell rice-2SG.GEN
'Your rice has a burned smell.'
- (8) ʃaŋtəs βaut zau, ŋiɬ=ti qa-βaŋtu.
fish smell fish this, want=ASP EPM-stink
'This fish smells quite strong; it's going to be stinky.'
- (9) A: ʃaŋtəs tazian. su-nia~niana?
fish smell here SU-RED~what
'There is a fish smell here. What is it?'
B: su-βau-βaut.
SU-RED~fish
'It's the fish.'
- (10) su-siɁ~siɁət razat a yau.
SU-RED~underarm smell person LIG this
'This person has an underarm smell.'
- (11) m-ruaq=ti mutun ʔnay.
AF-rotten=ASP mouse that
'That mouse was rotten.'
- (12) su-mru~mruaq=ti tawian.
SU-RED~rotten=ASP there
'There's a smell of rotten animal over there.'

The distinction of human vs. nonhuman in Kavalan not only exhibits in numerals (Li 2006), but also in lexical items pertaining to body parts and functions involving micturition, defecation, copulation, and pregnancy. As for the smells derived from micturition and defecation this distinction also applies to the relevant expressions. For example, the expressions *su-su~sum* 'smell of urine' and *su-ta~taɬ* 'smell of feces' are used for describing odors produced by animals. For those by humans, *su-tku~tkunu* 'smell of dull urine (as left on lower-body garments)' and *su-siŋ~siŋat* 'smell of feces (as left on lower-body garments)'⁷ are used, as shown in the following sentences:

⁷ The distinction on the usage between the citation forms of *sum/taɬ* and *tkunu/siŋat*, however, is pragmatic. My Kavalan informant Abas considers the former as rude if used on a person, and

- (13) su-tku~tkunu=ti, m-zizi=ti ya simi na sunis a zau.
 SU-RED~urine=ASP AF-wet=ASP NOM nappy GEN child LIG this
 ‘There is a smell of urine. This child’s nappy is wet.’
- (14) su-siŋ~siŋat ya kun-su.
 SU-RED~feces (on body) NOM skirt-2SG.GEN
 ‘Your skirt smells of feces.’

Semantic shift occurs when certain nouns are used to denote a specific smell either produced by or residing in the associated nouns. As the following three examples show, the smell of bad salted meat is described as having a smell similar to a fart; whereas the damp smell is associated with the noun ‘corner’. Body odor, on the other hand, is conceptualized as ‘the smell of a person’, as shown in (17).

- (15) su-ʔtu~ʔtut ni-umas-su tu siraw.
 SU-RED~fart PFV-to salt-2SG.GEN OBL salted meat
 ‘Your salted meat smells bad.’
- (16) su-tuq~tuqus siqar a zau.
 SU-RED~corner duvet LIG this.
 ‘This duvet smells damp.’
- (17) su-ra~razat aysu.
 SU-RED~person 2SG.NOM
 ‘You smell a lot (as haven’t bathed for a long time).’

3.2 Paiwan⁸

Paiwan seems to have no lexical item meaning ‘odor’ or ‘odorless’. There are three general olfactory terms: *səqu* (L) ‘stink, unpleasant smell, body odor’, *sa-[u]úm/sa-[ú]m*

the latter is euphemistic. Semantically, the former is more general and crude, referring to the urine or excrements left on the ground; whereas the latter is more specific and refined, referring to those still attached to one’s body. The word *tmakunu* means ‘to urinate without control’; while *siŋat* ‘feces left on buttocks’ (Li & Tsuchida 2006:467, 399). The human vs. nonhuman distinction does not apply to these lexical items.

⁸ Collected from four villages: Kavianan, Paḷaḷalan, Pucunug and Laḷauran, the Paiwan data in this paper are transcribed phonetically. Geographically from north to south is Paḷaḷalan, Kavianan, Pucunug, and Laḷauran. The expressions used in one village may not be used in another, thus the source is indicated after each data with the initials as K, PL, PC, and L for the villages, respectively.

‘pleasant smell, especially from plants or foods’,⁹ and *ɣuɿəɣuɿəɿ* (L) ‘fragrance’,¹⁰ which is the opposite of *səqu*.¹¹

Specific olfactory terms include *qavəɿəɣ* (L) for the odor of rotten food and animals (i.e. odor of putrefaction), *qəɣɿits* (L) for the odor of burned foods, *pasak* (L) / *pasa* (K) for the underarm smell, *ʌəɣsənsət* (K) for the smell of urine, and *əɣsənsəɿ* (K) / *əɣsəɿ* (PL) for the smell of feces.¹² See the following examples:

- (18) *qavəɿəɣ* ‘rotten food or animals’ > *sa-qavəɿəɣ~vəɿəɣ* ‘smell of rotten food or animals’ (L)
 cf. *qavəɿəɣ~vəɿəɣ* a kuɿavaw.
 RED~rotten LIG rat
 ‘This rat is rotten.’
- (19) *s<m>əqu-akən* ta *sa-qəɣ~ɿɿəɿɿts^h*. (L)
 <AF>smell-1SG.NOM OBL SA-RED~ burned smell
 ‘I smelled burned foods.’
- (20) *pasak* ‘body odor, underarm smell’ > *sa-pasa~pasak* ‘underarm smell, body odor, a smell emitted by goats’ (L)
- (21) *aits^hu* a *ts^hawts^haw* *sa-pasa* a *ravats*. (K)
 This LIG person SA-underarm smell LIG very
 ‘This person’s underarm smells very strong.’

The prefix associated with expressing ‘odor of X’ in Paiwan is *sa-*, which is polysemous. It also denotes the meaning of ‘have quality of X, be similar to X’ (Chang 2000). This linkage is explicable, as an olfactory experience often reminds someone of something associated with a certain smell, or of someone’s behavior through visualization. The prefix is in a way synæsthetic, which can be used to describe both an olfactory

⁹ According to my informant from Pucunug village, this word also means ‘smelly but edible animal body which has started to become rotten’ when used in the context of ‘hunted game’, as shown in the following sentence:

saɿuɿum manua namatsiaq?
 rotten or raw
 ‘It’s rotten or raw?’

¹⁰ Note that the non-reduplicated form **ɣuɿəɿ* is unattested.

¹¹ Given that stress in Paiwan usually falls on the penultimate syllable, stress which falls on the last syllable is marked in this paper.

¹² In Pucunug village, this term does not denote the smell of feces, however. It means general foul, stinky, or rotten smell. The meaning ‘smell of feces’ is indicated by *sa-tsaqi-tsaqi* < *tsaqi* ‘feces’.

experience and a visual mental image. The meaning is thus context-dependent. Further details are discussed in §5. See the following examples:

- (22) *sa-ts^həmə~ts^həməl* ‘smell of grass (if in the wild); smell of medicine (ex. if in hospital).’ (PL)
- (23) *ts^hawts^haw* ‘people’ > *sa-ts^hawts^haw* ‘behave like a human (e.g. as a monkey does)’ (L)
- (24) *kina* ‘mother’ > *sa-kina~kina* ‘behave like a mother’ (L)

This formation of *sa*-reduplication as an expression for odor in Paiwan is productive. First, it can be applied to general olfactory terms *səqu* and *ɣuɿəɣuɿəɿ*, but not *sa-[u]úm/sa[ú]m*, perhaps because the term is already lexicalized with the prefix *sa*-. Reduplication following the prefix *sa*- is optional, which indicates ‘intensity’, as shown in the following examples from Paḷaḷalan village.

- (25) *sa-siʔu-sun* *ri*.
SA-smell-2SG.NOM PTL
‘You smell. (with a soft tone)’
- (26) *siʔu* ‘smelly’ > *sa-siʔu~siʔu* ‘very smelly’
- (27) *sa[ú]m* ‘fragrant’ > *sa-[u~]úm* ‘very fragrant’

Secondly, *sa*-reduplication is not applied to the two specific olfactory terms: *ʔaɣsənsət* ‘the smell of urine’ and *aɣsənsəl* ‘the smell of feces’. The informant from the Kavianan village provides the two terms, and she does not accept the reduplicated form **sa-isi~isiʔ* ‘smell of urine’, though it is used in the other villages. It is suggested that these two terms are derived from reduplication with the bases as *ʔaɣsət* and *aɣsəl*, respectively. The latter is attested in Paḷaḷalan, which indicates ‘the smell of fart or feces’, as shown in the following sentence:

- (28) *aɣsəl* *a* *su-ətjut*
smelly LIG 2SG.GEN-fart
‘Your fart stinks’.
cf. **sa-aɣsəl*

Thirdly, nouns following the prefix *sa*- include bodily effluvia (e.g. urine, feces, sweat, blood), common domestic animals (e.g. dog, pig, cat), and specific plant names. The data from the Paḷaḷalan village show that specific odorant sources from plants are

preferred over general ones. For example, **sa-hana~hana* ‘smell of flowers’ (*hana* as a Japanese loanword) is unaccepted, whereas *sa-tʰava~tʰava* ‘a kind of yellow-whitish flower, *Gardenia jasminoides*) is preferred.

The same construction is also used to express taste, as shown in the following sentences from the Paʔaʔalan informant.

(29) kuŋa ‘not tasty’ > sa-kuŋa~kuŋa ‘taste very bad’

(30) sa-ŋua? aits^hu.
SA-good this
‘This tastes good.’

(31) matu sa-ŋua~ŋua?
seem SA-RED~good
‘This looks delicious.’

3.3 Truku Seediq

The word meaning ‘odor’ or ‘smell’ in Truku Seediq is the noun *kənux*, while ‘to smell (something)’ is *k<m>ənux* [kəmónux] or *sə-k<m>ənux* [səkəmónux].¹³ Although the noun *kənux* can be used neutrally as ‘odor’, it mostly connotes ‘bad smell’. The prefix *sə-* serves as a verbalizer and derives the meaning of ‘having a smell of X’. The meaning of ‘fragrant, pleasant smell’ is lexically composed as *suyay kənux* ‘(lit.) good smell’. There seems to be no word for the meaning ‘fragrant’ in this language. See the following examples:

(32) niq-an kənux hiyi=su.
exist-LF odor flesh=2SG.GEN
‘Your body has a smell.’

(33) tayaɿ kənux pəsiyus=su q<m>uci.¹⁴
much smell produce=2SG.GEN <AF>feces
‘Your fart has a very bad smell.’

¹³ In Seediq stress regularly falls on the penultimate syllable of a word. Suffixation or encliticization triggers stress shift rightwards along the phonetic material (Yang 1976, Holmer 1996, Tsukida 2005). Moreover, stress assignment in Truku Seediq is subject to the domain of a phonological word. For more details see Lee (2009b).

¹⁴ *pəsiyus q<m>uci* is a verbal phrase meaning ‘break wind’.

- (34) sə-kənux hiyi=su.
SE-odor flesh=2SG.GEN
'Your body smells.'
- (35) sə-bə~boxi bi ka hini, suyaŋ bi kənux=na.
SE-RED~lily very NOM here good very smell=3SG.GEN
'There's a smell of lilies here; the smell is very fragrant.'

Specific olfactory terms in Seediq seem very limited. So far only two of which are found: *qəḡaway* 'the underarm smell' and *bəgus* 'the smell of urine'. The former, however, cannot stand alone and must be attached by the prefix *sə-* to indicate the meaning. The latter is synonymous to *səhəmu* 'urine'.

- (36) sə-qəḡaway bi tuma qədu-an=su.
SE-underarm smell very under armpit-LOC=2SG.GEN
'Your armpit has a strong smell.'
- (37) sə-bə~bəgus bi.
SE-RED~urine very
'There's a very (strong) smell of urine.'

The form used to describe an odor in Truku Seediq involves the prefix *sə-* plus optional reduplication of the first syllable of the base, which indicates the odorant source. Given that the base is usually disyllabic, the vowel of the reduplicant is weakened because it occurs before the stressed penultimate syllable.

- (38) rabuŋ 'mold' > sə-rə~rabuŋ 'have a smell of mold'
- (39) kaciŋ 'cattle' > sə-kə~kaciŋ 'have a smell of cattle'
- (40) bərəbuḡ 'banana' > sə-bə~bərəbuḡ 'have a smell of banana'
- (41) ḡayat 'Sambucus formosana Nakai' > sə-ḡə~ḡayat 'have a smell of Sambucus formosana Nakai'
- (42) sə-hə~huḡiŋ ka sapah nii.
SE-RED~dog NOM house this
'This house smells of dogs.'

Although in Seediq reduplication of the source noun is optional for manifesting the meaning of odor, two phonological constraints are observed: first, when the first consonant of the base begins with *s*, reduplication is avoided, as shown below. Secondly,

for vowel-initial bases, the glottal stop functions as the default consonant for the onset of the reduplicant.

- (43) səqəmu ‘corn’ > sə-səqəmu ‘have a smell of corn’
cf. *sə-sə~səqəmu
- (44) yasa pə-səqama=ku yənsaŋ sə-səqəreŋuŋ
because CAUS-burn=1SG.NOM hay SE-smoke
ka ŋukus=mu.
NOM clothes=1SG.GEN
‘Because I burned a lot of hay, my clothes smell of smoke.’
- (45) sə-sinaw bi ka ŋəhak=su.
SE-alcohol very NOM breath=2SG.GEN
‘Your breath smells of alcohol.’
- (46) sə-sapaŋ ka buwax nii.
SE-cockroach NOM rice this
‘This rice has a smell of cockroaches.’
- (47) idaw ‘cooked rice’ > sə-ʔə~idaw ‘smell of cooked rice.’

However, *sə*-reduplication does not apply to any noun associated with odors. The formation is conceptualized and applied to those which can naturally emit smells. For example, halitosis (bad breath) and bromohydrosis (smelly feet) are not expressed by **sə-qə~quwaq* (< *quwaq* ‘mouth’) and **sə-qə~qaqay* (< *qaqay* ‘human feet’), but by compounds *səkənux ŋəhak* (bad smell + breath) and *səkənux qaqaq* (bad smell + feet), respectively. According to the informant, human mouth and feet do not naturally emit smells like those substances such as food, insects, or fauna and flora do.

It seems that perceptually certain body parts or effluvia are not considered as having any specific odor by the Seediq people. This can be evidenced by example (48). When asked for ‘smell of blood’, my informants do not consider that ‘blood’ can emit any smell, yet the same construction is used to show that ‘blood’ has a taste of its own.

- (48) dara ‘blood’ > sə-də~dara ‘taste of blood, as still raw’

The following two examples show that the same construction is used to indicate the meaning related to TASTE and LIKENESS, which is also found in Paiwan. See further discussion in §5.

- (49) maa=su sə-rə~rudan bi?
 why=2SG.NOM SE-RED~senior very
 ‘How come you smell of old people?’ (Also, ‘How come you talk/behave like a senior?’)
- (50) sə-bəlus ka bəgu nii.
 SE-insipid NOM soup this
 ‘This soup tastes insipid.’

3.4 Thao

Thao has a neutral olfactory term *faðik* meaning ‘odor’, which, like *weidao* in Mandarin Chinese, can also refer to ‘taste’. Blust (2003) notes that *faðik* is a reflex from PAN *Sajek ‘to sniff, to kiss’, and the derived form *f<m>aðik* means ‘to smell’.¹⁵ See the following two sentences:

- (51) f<m>aðik yaku, uka faðik.
 <AF>smell 1SG.NOM NEG odor
 ‘I smelled it, but it is odorless.’
- (52) taðam-ik k<m>an, uka faðik.
 try-1SG.PF <AF>eat NEG taste
 ‘I tried tasting it, but it is tasteless.’

Blust (2003:183) records that ‘the odor of X’ in Thao is expressed by prefixation with *tu-* plus Ca-reduplication, which forms a monosyllabic reduplicant by copying the first consonant of the base plus the vowel *a*. This formation appears to be productive, as the X can be any noun referring to a participant capable of emitting smell, such as animals (e.g. pig, dog, bear, fish, carabao, goat, deer), insects, bodily effluvia (e.g. feces, urine, sweat),¹⁶ or manmade consumptions (e.g. tobacco and alcohol). See the following examples:

¹⁵ The other word meaning ‘to smell’ recorded by Blust (2003:888) is *faykið* with the examples as *faykið-ik* ‘I am smelling something’ and *f-in-aykið-ik* ‘I smelled something’. However, this word was not accepted by my informant Kilash, who confirmed that there is only one word meaning ‘to smell’.

¹⁶ The example *tu-ta-taʔum* meaning ‘the odor of blood’ listed by Blust (2003:183) is not accepted by my informant, as he considers that blood does not smell.

- (53) $\Phi a\Phi uy$ ‘pigs’ > $tu-\Phi a\sim\Phi a\Phi uy$ a $\mathfrak{fa}\mathfrak{d}\mathfrak{i}k$ ‘smell related to pigs, pigs’ feces, pigsties.’
- (54) $mihu$ a $rima$ $tu-ra\sim rusaw$.
 2SG.GEN LIG hand TU-RED~fish
 ‘Your hands have a fish smell.’
- (55) $a\mathfrak{a}$ $pi\mathfrak{f}-tubu$ $tu-ta\sim tubu$.
 baby CAUS-urine TU-RED~urine
 ‘The baby peed and smelled of urine.’
- (56) $mihu$ a $hulus$ $tu-\mathfrak{fa}\sim\mathfrak{f}ibun$.
 2SG.GEN LIG clothes TU-RED~sweat
 ‘Your clothes smell of sweat.’
- (57) $hiya$ wa θau $ma\theta uaw$ $miku-i-q\mathfrak{i}\mathfrak{a}$ sa $q\mathfrak{i}\mathfrak{a}$,
 this LIG person very desire.to-drink SA alcohol
 $\theta i\theta u$ wa $buut$ $tu-qa\sim q\mathfrak{i}\mathfrak{a}$.
 3SG LIG body TU-RED~alcohol
 ‘This person likes drinking very much and his body smells of alcohol.’
- (58) $haya$ wa θau $ma\theta uaw$ $miku-kan$ $tamaku$,
 that LIG person very desire.to-eat tobacco
 $tu-ta\sim tamaku$ sa $buut$.
 TU-RED~tobacco SA body
 ‘That person likes smoking very much and his body smells of tobacco.’

Like other languages, the neutral olfactory term $\mathfrak{fa}\mathfrak{d}\mathfrak{i}k$ mostly connotes negative odors when affixed. For example, $min-\mathfrak{fa}\mathfrak{d}\mathfrak{k}-in$ means ‘become odorous’, and $\mathfrak{fa}\mathfrak{d}\mathfrak{k}-in$ ‘smelly odor, foul smell’. Contrary to $\mathfrak{fa}\mathfrak{d}\mathfrak{k}-in$ is the positive olfactory term $ma-kan\mathfrak{fu}\mathfrak{d}$ ‘fragrant’, of which the bound root $-kan\mathfrak{fu}\mathfrak{d}$ is also gustatory, as it also means ‘tasty, delicious’. This shows that in Thao smell is lexically linked with taste.

- (59) $\mathfrak{fa}\mathfrak{d}\mathfrak{k}-in$ uan $nuhu$ ya $ma-kan\mathfrak{fu}\mathfrak{d}$.
 smell-PF PM¹⁷ 2SG if fragrant
 ‘(You) smell and see if it is fragrant.’
- (60) $mihu$ a $p-in-in-tata$ wa $pania\mathfrak{a}n$ $ma\theta uaw$ $ma-kan\mathfrak{fu}\mathfrak{d}$.
 2SG.GEN LIG boiled food LIG dishes very fragrant
 ‘Your cooking smells very nice.’

¹⁷ Politeness marker, following Blust (2003).

- (61) ihu ya pitʔia sa aɸu pia-kanʃuð a ma-qitan kan-in.
 2SG.NOM YA cook SA rice CAUS-tasty LIG good food
 ‘You cook rice and make it delicious; that’s good food.’

Thao has the following specific olfactory terms: *ðanʃiʃ* ‘body odor’ with the reduplicated form *tu-ða~ðanʃiʃ* means ‘odor of the body, especially the underarm odor’. According to the informant, this form is used when politely telling the person with the smell. For example,

- (62) mihu a ka~kurkur tu-ða~ðanʃiʃ.
 2SG.GEN LIG armpit TU-RED~body odor
 ‘Your armpit has a smell.’

Another term is *ʃaʃu*, meaning ‘unknown foul or chemical smell (as from factories)’,¹⁸ hence the form *tu-ʃa~ʃaʃu*. See the following sentence:

- (63) ita ʃa-na~nay minu a tu-ʃa~ʃaʃu?
 1PL.INCL. NOM get.here what LIG TU-RED~foul smell
 ‘We just got here, but what’s the smell?’

The word *ma-ɸanʃuʃ* denotes ‘rotten and smelly, as of a sweet potato or yam’. Like *ma-kanʃuð*, it is also gustatory, which can be used to describe a food which tastes rotten. This term can also be used to describe the smell of someone’s breaking wind, which is considered as rotten as a bad yam. This relation is understandable inasmuch as eating yams is a likely cause of flatulence.

- (64) buna ma-ɸanʃuʃ-iða, ma-qarman kan-in.
 yam rotten-already bad food
 ‘The yam is already rotten; it’s bad food.’
- (65) buna a-min-ɸanʃuʃ-iða.
 yam FUT-become-rotten-already
 ‘This yam is going to be rotten and smelly.’

¹⁸ Blust (2003:183-184) notes that the meaning of the base *ʃaʃu* cannot be obtained, and the form *tu-ʃa~ʃaʃu* is glossed as ‘foul smell, as from a pigsty’. However, the meaning is slightly different from my informant’s remarks. Kilash said that *tu-ɸa~ɸaɸuʃ* is used to express the smell emitted by pigs, or the foul smell from a pigsty.

- (66) *ihu q<un>tut piʃ-ʃanʃuʃ, maθuaw ʃaðk-in.* (Blust 2003:373)
 2SG <AF>fart CAUS-rotten, very smelly-PF.
 ‘You farted (and) it was rotten, very smelly.’

Finally, the specific olfactory term *qantir* refers to ‘the smell of burned food’. See the following sentence:

- (67) *ihu p-in-tata sa paniaʔan ʃkaθiwan, tu-qa~qantir.*
 2SG cook SA dishes burned TU-RED~burned smell
 ‘The food you cooked is burned. There’s a burned smell.’

Therefore, in Thao ‘smell of X’ can be expressed either by [X *a ʃaðik*] or [*tu*-CaRED~X *a ʃaðik*]. The difference lies in that the former is generally used when the object related to the smell is in sight, whereas the latter when the source of the smell cannot be seen or identified. See the following examples:

- (68) *bukay itia ʃaðik, maθuaw ma-kanʃuð.* (cf. Blust 2003:904)
 flower have smell, very fragrant
 ‘Flowers have a smell, very fragrant.’
- (69) *intua tu-ba~bukay a ʃaðikʔ*
 where TU-RED~flower LIG smell
 ‘Where’s the smell of flowers (from)?’

4. Similarities and differences in the odor categories

A few Formosan languages employ reduplicative construction plus a certain prefix to express odors.¹⁹ The data in the four languages serve as a sample of evidence. Based

¹⁹ Amis and Puyuma also use reduplication with a prefix for expressing odors. In Amis the prefix *hara-* is attached to the reduplicated noun as the odorous source. In Puyuma the prefix is *arə-* (Cauquelin 1991:36). See the following examples:

- (i) Amis (Bakung village, Feng-pin, Hualien)
- a. *hara-futi~futiŋ itini.*
 HARA-RED~fish here.
 ‘It smells of fish here.’
 - b. *hara-tana~tanaŋ kisu.*
 HARA-RED~sweat 2SG.NOM
 ‘You smell of sweat.’

on the data presented above, some similarities and differences are observed regarding both general and specific olfactory terms, and their interaction with reduplication.

First, only Seediq and Thao have a neutral olfactory term referring to ‘odor’, while every language has an olfactory term for ‘general foul or unpleasant smell’. As for ‘general fragrant or pleasant smell’, Seediq has no such a lexical item. It is expressed by a compound *suyaŋ kənux* (good+smell).

Secondly, the verb ‘to smell’ is morphologically associated with ‘foul or unpleasant smell’ in Paiwan, Truku Seediq, and Thao. See the following table:

Table 2: Olfaction-related terms in these languages

	KAVALAN	PAIWAN	TRUKU SEEDIQ	THAO
neutral olfactory term	X	X	kənux	ʃaðik
‘to smell’	siŋut	s<m>iqu	k<m>ənux	ʃ<m>aðik
‘foul smell (general)’	βaŋtu	siqu	sə-kənux	ʃaðk-in
‘pleasant smell (general)’	βaŋsis	sa-ʃum	X	ma-kanʃuð

This table shows that the lexical item denoting ‘general foul smell’ is the basic olfactory term in these languages, implying that whenever we feel consciously having to smell something, the trigger tends to be a foul odor. This is also reflected by the specific olfactory terms in these languages which will be discussed below. Moreover, not every language has a lexical item for ‘pleasant odor’. In these languages with such a lexical item, it has no morphological connection with the verb ‘to smell’.

In response to what Dubois & Rouby (2002:49) state that ‘in contrast to the situation with colors, odors have no specific names, at least not in English or in French’, in Kavalan, Paiwan, and Thao several names for specific odors are found, which are categorized as a kind of foul odors. The following tables list the olfactory terms for specific odors in these languages.

-
- (ii) Puyuma (Cauquelin 1991:36)
- | | |
|-----------------|-------------------------|
| arə-ʃaqi~ʃaqi | ‘to smell of excrement’ |
| arə-tomako~mako | ‘to smell of tobacco’ |

Table 3: Kavalan specific olfactory terms

Type of odor	olfactory term
smell related to fish and sea; beef, body odor of a dog; blood ²⁰	ʔaŋtəs
smell of rotten cooked food, dishes, soup, etc.	βaŋti
underarm smell	sɪkət
smell of burned rice	iŋtuɐ

Table 4: Paiwan (Kavianan) specific olfactory terms

Type of odor	olfactory term
smell of rotten food and animals, of putrefaction	qavə[əŋ
smell of burned food	qaŋ[its
an underarm smell, or animal body odor, e.g. goat	pasak
smell of urine	ʔaŋsənsət
smell of feces	aŋsənsəl

Table 5: Seediq specific olfactory terms

Type of odor	olfactory term
an underarm smell	-qəɕawaŋ
smell of urine	bəgus

Table 6: Thao specific olfactory terms

Type of odor	olfactory term
body odor, especially referring to the underarm	-ðanʃiʃ
unknown unpleasant smell, as from factories	-ʃaʃu
smell of something rotten, e.g. yam, fart	-ɸanʔuʃ
smell of burned food, e.g. rice	-qantir

²⁰ In Kavalan ‘the smell of blood’ can be described by *su-βi~βinaŋ* or *ʔaŋtəs*. The former is used when the amount of blood is more restricted and confined, as in a dish. However, when there’s a greater amount of blood from a slaughtered animal, the latter is used. See the following examples. Also compare Proto-Philippines **laysi* ‘smell of fish, taste of blood’, Kankanay *layʔes* ‘smelling of fish’, or Cebuano *laysa* ‘having a fish smell or the taste of blood’ (Blust 1988:60).

- (a) *su-βi~βinaŋ-pama tamun zau.*
 SU-RED~blood-still dish this
 ‘The dish still smells some blood.’
- (b) *ʔaŋtəs siŋut-an βinaŋ ʔnay.*
 fishy smell to.smell-LOC blood that
 ‘The blood smells a lot.’

These specific terms can be mostly categorized as ‘negative smells’.²¹ It is interesting to find that each language has a term for the underarm smell, which in Paiwan is semantically linked to the smell of goats. The other term in common is the smell of burned food, especially rice, which is found in three languages except Seediq. Overall, similarity on naming specific odors can be found in these languages, which generally involve rotten food, body odor, and bodily effluvia.

In his study on Austronesian root theory, Blust (1988:60) notes that ‘in a number of the Formosan and Western Malayo-Polynesian languages a phoneme sequence that reflects *(C)əŋ(e)CV(C) is recurrently associated with the meaning of “stench, bad odor”’. Blust (1988:59) terms such a case “Gestalt symbolism” as “it consists of the correlation of a meaning ...with a larger configuration that must be defined both in terms of phonemes and of syllables.”²² It can be seen from the tables above that Kavalan *βaytu* ‘foul smell’ and *βaysis* ‘fragrant odor’ are reflexes of the phoneme sequence. Also Paiwan *qaylits* ‘smell of burned food’ is a reflex of PAN *qəŋeliC ‘smell of burned rice, etc.’

Regarding the interaction between reduplication and olfactory terms in these languages, the reduplicative construction schematized as [PREFIX-(REDUPLICATION) X] is mostly applied to the specific terms to express the odors in Kavalan and Thao. In Kavalan *su*-reduplication can be attached to the four terms in Table 2, which in citation form function as a verbal predicate or a noun. However, *su*-reduplication is not applied to the general olfactory terms such as *βaytu* and *βaysis*. This restriction is also seen in Thao, as **tu-fa~faðik* nor **tu-ka~kanfuð* is attested. However, in Paiwan it is a different picture. The general olfactory terms in Paiwan can be attached by the prefix *sa-*, as well as some specific olfactory terms, except the two specific terms *ʌaysənsət* ‘smell of urine’ and *aysənsəl* ‘smell of feces’, which are also verbal. In Truku Seediq the prefix *sə-* makes no distinction on general vs. specific olfactory terms. The following table summarizes this distribution.

Table 7: Reduplication and olfactory terms

Language	General terms	Specific terms
Kavalan	Not applicable	Applicable
Paiwan	Applicable	Not applicable to <i>ʌaysənsət</i> ‘smell of urine’ and <i>aysənsəl</i> ‘smell of feces’
Truku Seediq	Applicable	Applicable
Thao	Not applicable	Applicable

²¹ My Kavalan informants consider that *ʌaytəs* ‘smell related to fish’ is not necessarily foul.

²² I would like to thank the reviewers for pointing this out.

5. Semantic association of reduplication for odor expressions

In this section the semantic association of reduplication as a linguistic means for expressing odors in Formosan languages is discussed. Language differs in the means for odor-related expressions. For example, in English or in French ‘odor’ is considered as ‘part of’ the odorant source (cf. David 2002), such as *une odeur de rose* ‘an odor of rose’. In the four Formosan languages aforementioned, reduplication is employed to express odors. One question raised here is on what account is reduplication the means of linguistic expressions for odors.

In this paper I propose that the reason why reduplication is employed as the means for expressing odors is due to its semantic association with both PLURAL and ITERATIVE. Having a smell is a continuing process, and it is mentally perceptible that there should be enough entities in order to produce a persistent smell. The semantic network proposed in Lee (2007) can be used to account for the relationship between reduplication and odor in these Formosan languages.

Based on the semantic network proposed by Lee (2007), the meanings manifested by reduplication are considered as motivated by iconicity, originating from REPETITION. The concept of REPETITION can be interpreted as doubling (at least) of an entity or an action, thus it entails plurality and iteration. Therefore, in the semantic network REPETITION develops two prototypical notions manifested by reduplication: PLURAL and ITERATIVE.

ITERATIVE further entails two main temporal categories: CONTINUATIVE and FREQUENTATIVE, whereas PLURAL consists of two contradictory notions: QUANTITATIVE and DIMINUTIVE, based on physical and biological grounds, respectively. The former is associated with PLURAL by multiplicity of entities in size such as one plus one equals two, while the latter is linked with the natural fact that a child (i.e. a small human or animal) is produced by both parents. This biological process of reproduction is inherently pluralization, which results in diminution—a small-sized entity with similar parental features (Lee 2007).

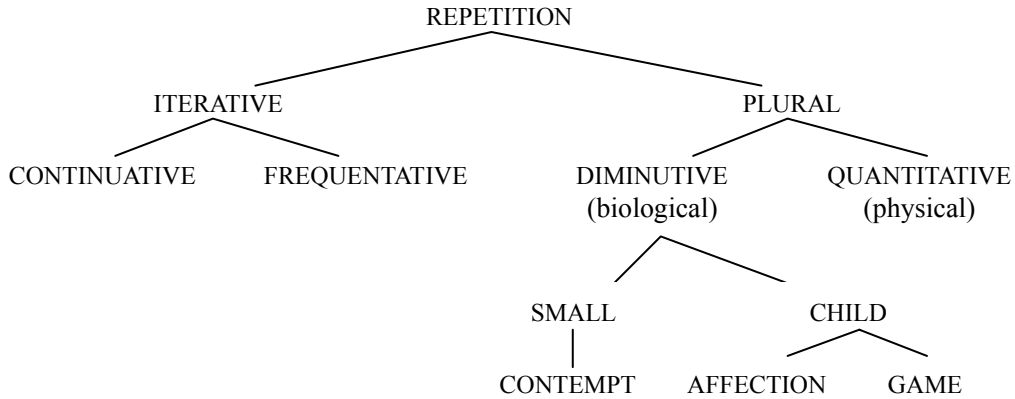


Figure 1: The semantic network for the meanings of reduplication (Lee 2007:231)

This association is inferred by the syntactic distribution of the schema [PREFIX-(REDUPLICATION) X], which in these languages also possesses temporal properties. In Kavalan, *su*-reduplication is a derivational process, in which the prefix turns the reduplicated nominal into a verbal predicate, which can be suffixed by aspectual enclitic such as *=ti* (Lee 2009a). In Thao, the expression *tu-Ca~X* can function as a dependent clause, which denotes a state, as shown in sentence (67). In Truku Seediq, the prefix *sə-* preceding a noun X denotes the meaning of ‘having the smell of X’, and reduplication mainly indicates plurality of the entity X, hence can be optional. The prefix *sə-* in Truku Seediq is a verbalizer, able to attach to any noun semantically fit for odor description.

Moreover, linguistic expressions for odors in some of these languages can be extended to indicate the meaning of LIKENESS.²³ This semantic extension is commonly found when the attached noun is [+human] or [+animate, –human]. The latter is often used as verbal abuse, especially when the nouns refer to domestic animals such as pigs and dogs.

- (70) Truku Seediq
sə-rə~rudan=su bi.
 SE-RED~old people=2SG.NOM very
 ‘You act very mature (i.e. like a senior).’

²³ LIKENESS is subsumed under the notion of FACSIMILE and GAME. In the semantic network shown above, GAME is a notion semantically and pragmatically developed from CHILD. The notion of CHILD is a sense proposed in Jurafsky’s (1996) Structured Polysemy model for the semantics of the diminutive. Jurafsky (1996) considers the core concept of the diminutive as CHILD, which motivates SMALL. The notion of SMALL pragmatically generates CONTEMPT.

- (71) Vuṇalid Paiwan (Lee 2007:252)
- a. vavajan ‘female’ > sa-vavaja~vajan ‘act like a woman, sissy’
 - b. uqaʔaj ‘male’ > sa-uqaʔa~qaʔaj ‘behave like a man, very handsome’²⁴
- (72) Laʔauran Paiwan
- sa-vatu~vatu timazu.
 - SA-RED~dog 3SG.NOM
 - ‘He behaves like a dog (as verbal abuse).’

The polysemous status of the prefix denoting ‘to have an odor of X’ and ‘to behave like an X’ can be viewed as a phenomenon of linguistic synæsthesia, which, as defined by Holz (2007:193), is “the co-occurrence of interdependent lexemes originally stemming from different sensory modalities”, illustrated as describing one sense modality by using words that usually describe another. Some examples in English include *warm color* (tactile + visual) and *sweet smell* (gustatory + olfactory).

Holz (2007) distinguishes three levels of linguistic synæsthesia, and based on which, the schematic construction [PREFIX-(REDUPLICATION) X] in these Formosan languages involving visual, olfactory, and gustatory sensory modalities is considered at morpho-syntactical level, as patterns of lexical recurrence is reminiscent of reduplicative construction. See the following table from Holz (2007:195):

Table 8: Linguistic synaesthesia on different linguistic levels

Linguistic level	Syntactic construction
Lexical	Immediate synaesthetic expressions
Morpho-syntactical	Patterns of lexical recurrence
Textual	Semantic clustering

This cross-modality synæsthetic perception can be visualized by the following modal shown as Figure 2, with olfaction as the intersection for both gustatory and visual senses. Based on the linguistic data presented in the previous sections, the construction in Kavalan is used to express olfactory perception only; while in Thao the construction is used to express both olfactory and gustatory perceptions. In Paiwan and Truku Seediq it can be used to express visual, olfactory, and gustatory perceptions. Therefore, Thao is

²⁴ The Paiwan data above also display pragmatic functions. The addressee’s gender determines the interpretation of both positive and negative meanings. For example, if (71a) is used on a woman, it is a complementary. If used on a man, then the connotation is that he is camp. The same applies to (71b) (Lee 2007).

placed towards the gustatory edge, whereas Paiwan and Truku Seediq are towards the visual edge, along the sensory continuum.

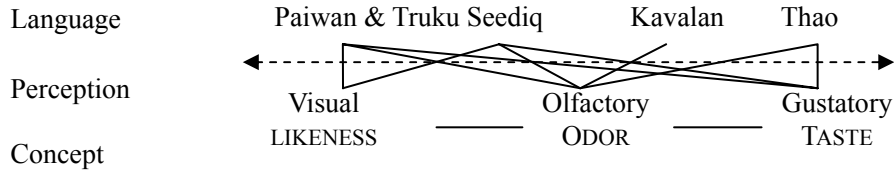


Figure 2: Synæsthetic perceptions in the four languages

6. Concluding remarks

In this paper the olfaction-related data in four Formosan languages—Kavalan, Paiwan, Truku Seediq, and Thao are presented, showing that reduplication is employed as a common means to express odors in these languages, apart from limited general and specific olfactory terms.

Even though these languages all employ the schema [PREFIX-(REDUPLICATION) X] to express odors, they vary in terms of reduplicative patterns and lexical selection. The following table summarizes the reduplicative pattern chosen in each language for odor expressions.

Table 9: Reduplicative patterns in the four languages for odor expressions

Language	Reduplicative pattern
Kavalan	Mono-syllabic or disyllabic reduplication: determined by the first syllable of the base; reduplication is obligatory
Paiwan	Full reduplication; reduplication is optional
Truku Seediq	Partial reduplication of the first syllable; reduplication is optional
Thao	Ca-reduplication; reduplication is obligatory

This study demonstrates that the four languages all have a lexical item for the meaning of ‘foul smell’, but not that of ‘pleasant smell’, suggesting that the former is the basic olfactory term in these languages. It also shows that the lexical item ‘foul smell’ is morphologically linked with the verb ‘to smell’ in Paiwan, Truku Seediq, and Thao.

Common specific olfactory terms in the four languages are associated with rotten or burned food, body odor, and bodily effluvia. However, it is a language-specific property for having certain specific olfactory terms. These terms are reflection of the people’s socio-cultural aspects such as their main diets and what considered as salient olfactory stimuli.

Given such very few olfactory terms in these languages, it can be suggested that smell probably plays a rather minor role in shaping their ideas for the outside world, as odors are not generally used to symbolize things in their lives.²⁵

This paper also attempts to provide an explanation for reduplication being used to express odors in these languages. It is proposed that as in language the most prototypical meanings manifested by reduplication are ITERATIVE and PLURAL, the effect of ‘having a smell’ pertaining to this semantic association is due to having the properties of being both continuative and multiple. The semantic network for the meanings of reduplication proposed in Lee (2007) is used to account for the association between reduplication and olfactory expressions. It is suggested that the use of reduplication to manifest the meaning SMELL is a projection of the links between ITERATIVE and CONTINUATIVE, as well as between PLURAL and QUANTITATIVE and pragmatically DIMINUTIVE, as shown in Figure 1.

Therefore, smell is perceived as an invisible substance which floats in the air and effectively brings out responsive emotions, either pleasant or unpleasant. Having a smell is a continuing process, and it is mentally perceptible so as to have multiple entities in order to produce the smell. Pragmatically, smells incurring negative emotion will degenerate diminutive notions, especially contempt; whereas fragrant smells are often used to increase intimacy or affection between people.

Finally, a phenomenon called linguistic synæsthesia is identified to account for the same construction being used in cross-modality expressions, including visual, olfactory, and gustatory senses. The polysemous status of the schema [PREFIX-(REDUPLICATION) X] in these languages is reminiscent of the morphosyntactic level of linguistic synæsthesia devised by Holz (2007) as shown in Table 8.

It is found that Kavalan only uses the construction for describing olfactory sense; whereas Thao uses the construction for both olfactory and gustatory senses. Paiwan and Truku Seediq use the construction for all three senses. This distribution is modeled as Figure 2.

A summary of the findings regarding linguistic expressions on olfaction in the four languages is presented in Table 10 as follows. In conclusion, this paper not only is a beginning of the future investigation on olfactory terms and odor expressions in Formosan

²⁵ Based on Pandya (1987), Classen (1993:127-128) mentions that the Ongee people who live in Little Andaman Island consider smells as their fundamental cosmic principles. Their lives revolve around the odor of their world. For example, an Ongee puts a finger to the tip of his or her nose to refer to ‘me’. Death is interpreted by the Ongee as ‘the loss of one’s personal odor’. Similarly, the Desana of the Amazonian rainforest of Colombia use smells to express their concepts of space, mark tribal territory, and trace the location of animals (Classen et al. 1994).

languages, but also intends to open another window towards our understanding of the relationship between language and perceptions.

Table 10: Linguistic expressions on olfaction in the four languages

Language	Kavalan	Paiwan	Seediq (Truku)	Thao
Expression				
The prefix	su-	sa-	sə-	tu-
Redu~pattern	full/partial	full	partial	Ca-
Redu~optionality	obligatory	optional	optional	obligatory
the verb ‘to smell’	siŋut	s<m>iqu	k<m>ənux	ʃ<m>aðik
odor (neutral)	X	X	kənux	ʃaðik
General olfactory term				
foul smell	βaŋtu	siqu	sə-kənux	ʃaðk-in
fragrant smell	βaŋsis	sa-lum	X	ma-kanʃuð
Olfactory term for a specific smell				
fish, blood	ɬaŋtəs	X	X	X
rotten food	βaŋti	qavə[əŋ]	X	-ɸaŋtuʃ
burned food	iŋtuɐ	qaŋlits	X	-qantir
underarm	siɬət	pasak	-qəʒawaŋ	-ðanʃiʃ
urine	X	ɬaŋsənsət	bəgus	X
feces	X	aŋsənsəl	X	X
unknown foul	X	X	X	-ʃaʃu
Synaesthetic perceptions				
visual	X	√	√	X
olfactory	√	√	√	√
gustatory	X	√	√	√

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四個台灣南島語的重疊與氣味

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本論文為構詞及語意介面的研究，探討四個台灣南島語，即噶瑪蘭語、太魯閣賽德克語、排灣語及邵語的嗅覺詞彙及其對氣味的表達方法。本研究發現這些語言除了透過少數的嗅覺詞彙來表達氣味之外，重疊則是最常用的方法。這些語言均使用類似的前綴並結合不同的重疊形式來表達該語意：噶瑪蘭語為 *su-*，太魯閣賽德克語為 *sə-*，排灣語為 *sa-*，邵語為 *tu-*。本論文並針對兩點進行討論：第一，各語言所選擇的重疊形式；第二，相關詞彙與重疊結構的選擇限制。本論文認為重疊之所以為表達氣味的常用方法，乃是由於重疊所表達的典型語意為複數及時態的概念。一種氣味的發生時常是持續性的，並且感受者在心理上常會形成多數性的認知。過去心理學對氣味感知及辨識的相關實驗研究中，均顯示受試者描述氣味感知的語言能力很貧乏。因此，本論文探討上述語言對氣味描述的相似性及差異性，並從這樣的比較中得到語意上的啟示。

關鍵詞：重疊，台灣南島語，氣味，嗅覺詞彙