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Anger stinks in Seri: Olfactory metaphor in a lesser-described language

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Abstract: Previous studies claim there are few olfactory metaphors cross-linguistically, especially compared to metaphors originating in the visual and auditory domains. We show olfaction can be a source for metaphor and metonymy in a lesser-described language that has rich lexical resources for talking about odors. In Seri, an isolate language of Mexico spoken by indigenous hunter-gatherers, we find a novel metaphor for emotion never previously described – "anger stinks". In addition, distinct odor verbs are used metaphorically to distinguish volitional vs. non-volitional states-of-affairs. Finally, there is ample olfactory metonymy in Seri, especially prevalent in names for plants, but also found in names for insects and artifacts. This calls for a re-examination of better-known languages for the overlooked role olfaction may play in metaphor and metonymy. The Seri language illustrates how valuable data from understudied languages can be in highlighting novel ways by which people conceptualize themselves and their world.

Keywords: Seri, olfaction, metaphor, metonymy, emotion

1 Introduction

It has been claimed there are few olfactory metaphors cross-linguistically, especially when considered in contrast with the metaphorical potential found for vision or audition (Ibarretxe-Antuñano 1999a, Ibarretxe-Antuñano 1999b; Sweetser 1990; Viberg 1984). Vision, in particular, is a well-known source domain for expressing notions of knowing or understanding (e. g., *I see what you mean*; e. g., Sweetser 1990; Viberg 1984). Visual adjectives of color similarly display rich metaphorical possibilities (e. g., *I'm feeling blue*; *She saw red*; *The new project manager is green*; cf., Anderson and Bramwell 2014). Likewise, audition verbs acquire meanings related to the domain of cognition in

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Australian aboriginal languages (e. g., *aweyel* 'hear, listen; understand' in Alyawarra; Evans and Wilkins 2000), and linguistic communication in others (e. g., the audition verb *me-* in Cha'palaa can mean 'ask'; San Roque et al. 2018).

In contrast, smell is said to be less likely to serve as a source domain for metaphor, considering both basic perception verbs (e. g., *look* vs. *smell*; cf. Sweetser 1990) and quality terms typically encoded as adjectives in Standard Average European languages. For example, Williams (1976) examined how English sensory adjectives change meaning over time, and claimed: "There are no primary olfactory words in English (i. e., none historically originating in the area) that have shifted to other senses" (Williams 1976: 464).

More recent studies suggest that olfaction may, in fact, have some metaphorical possibility (Anderson 2019; Kövecses 2019; Sweetser 1990; Ibarretxe-Antuñano 1999a, Ibarretxe-Antuñano 1999b; Neagu 2013; Storch 2013; Thanassoula 2012; Evans and Wilkins 2000; Fernández Jaén 2012). Olfactory metaphors can involve general negative characteristics (*The movie stinks*), suspicion (*The cops could smell a rat*), investigation/search (*He was sniffing around the apartment for clues*), and knowledge (reported for Luwo, a Nilotic language of Sudan; Storch 2013). Nevertheless, in comparison to vision, the metaphorical potential of olfaction appears restricted.

The scarcity of olfactory metaphors could indicate something fundamental about our sense of smell. It has been claimed that the human sense of smell is impoverished (cf. McGann 2017). If the primary sensory experience of smelling is not very reliable then it would not lend itself as a basis for understanding other aspects of experience. A corollary of this is our limited lexicon for talking about smell. While it is cross-linguistically common to make a distinction between activity, experience, and source expressions for vision (e. g., English *look at, see, looks*); these are typically conflated under a single verb for olfaction (i. e., English *smell*). Similarly, Sperber (1975: 116) states: "There is no semantic field of smells"; i. e., there is limited vocabulary for talking about qualities of smell.

However, this picture is being overturned. The human sense of smell is much better than previously thought (Majid et al. 2017; McGann 2017): people can distinguish trillions of odors (Bushdid et al. 2014), determine whether something is edible or hazardous from its smell (Stevenson 2010), and recognize the scent of their kin – even as children (Schaal 2017). Our sense of smell is, in fact, highly informative.

Similarly, studies show that smell may not be ineffable (cf. Levinson and Majid 2014) in all languages. Elaborate olfactory lexicons have been reported in the Aslian languages of the Malay Peninsula (e. g., Burenhult and Majid 2011; Majid and Burenhult 2014; Wnuk and Majid 2014; Tufvesson 2011), Formosan languages of Taiwan (Lee 2010), Nilotic languages of East Africa (Storch and Vassen 2007;

Storch 2013), Totonac-Tepehua languages of Mexico (Aschmann 1946; Enríquez Andrade 2004, Enríquez Andrade 2010; O'Meara et al. 2019), and Seri, a language isolate spoken in Mexico (O'Meara and Majid 2016). All these languages distinguish olfactory qualities with distinct lexemes. For example, in Seri there are seven verb roots that distinguish classes of odors from one another. Given this elaboration, one could ask whether olfaction is also more likely to be a source domain for metaphor in such languages. This question has never been directly addressed through systematic investigation by prior studies. In this paper, we ask for the first time what are the distinct types of metaphoric mappings and metonymic extensions we find in a language with lexical elaboration in the olfactory domain.

We focus on a single language – Seri. The Seri data provides a fresh perspective on olfactory language, illustrating smell metaphors for mental and emotional states, as well as smell metonymy used in plant and animal names. In particular, the data from Seri show semantic extension from the smell domain to describe anger. These findings provide new insights into the metaphorical relationship between olfaction and emotion. More generally, we show olfaction can be a rich source domain for metaphor and metonymy.

2 Seri language and its olfactory lexicon

Seri is a language isolate spoken in two coastal villages in northwestern Mexico by approximately 900 speakers, more than triple the number of speakers reported at the turn of the twentieth century (Marlett 2016). Sociolinguistically, Seri is considered to be relatively vital, with children still acquiring the language. Nevertheless, the use of Spanish – the dominant language of the area – is notably on the rise among younger speakers, and passive knowledge of the language is becoming more common. Previous studies on Seri include a trilingual Seri-Spanish-English dictionary with grammatical sketch (Moser and Marlett 2005, Moser and Marlett 2010), an extensive grammar (Marlett 2016), and various articles on phonology, morphophonolgy, syntax and semantics (e. g., Baerman 2016; Marlett 1981, Marlett 1984, Marlett 2010, Marlett 2012; O'Meara 2010, O'Meara 2011, O'Meara 2014). Typologically, Seri is predominantly head-final and verb-final (Marlett 2008).

Seri has a closed adjective class with less than 20 items (Moser and Marlett 2005). Sensory qualities (e. g., color, sound, smell, etc.) are expressed in verbal predicates. There is a set of seven verbal predicates that describe abstract odor qualities and one general smell verb (see O'Meara and Majid 2016; Table 1). The general smell verb *casii* 'smell of' (derived from the transitive verb *csii* 'smell

(something)') can be used to indicate an object smells of a particular odor source (e. g., *¡Mitaamt coi sliitxcoj x**asii**!* 'Your shoes smell like skunk!'). Its transitive counterpart *csii* 'to smell' is used in activity and experiencer constructions.

The core set of smell verbs are intransitive predicates. They take as subjects a nominal whose referent has the smell quality being described. This is shown in (1) where the subject is *hacat* 'shark' and the verbal predicate is *cheemt* 'stink'; and in (2) where the subject of *ccotxta* 'stink' is a man previously mentioned in the discourse.[1]

(1) *Hacat quih* ***xo-heemt****!*
shark DEF.ART.UNSPEC EMPH-stink
'Sharks stink!' (O'Meara and Majid 2016: 115)

(2) *Icáaisx z iyéxl,* ***t-cotxta****, hax ano*
soap INDEF.ART 3;3.REALIS.YO.buy DEP.REALIS-stink water 3POSS.in
saalim ca tete.
SBJ.NMLZ.IRR.play AUX DEP.REALIS.say
'He bought soap and said that he was going to bathe because he had body odor.' (Moser and Marlett 2010: 172)

The seven verb roots (Table 1) are used to describe a variety of odor sources (i. e., they are not specific to a single source) and are not linguistically derived from the nominal domain. Example referents for each verb, as listed by native speakers of Seri, are provided in Table 1. This data was collected using a combination of methods, including listening to daily conversations for use of smell verbs, as well as exemplar listing using the known smell verbs within a frame in order to ask in Seri "What stinks?" (e. g., *¿Ázya theemt*? 'What has the property of *cheemt*?'). Exemplars are listed in Table 1 in the order produced by native speakers; items produced earlier are generally considered to be more psychologically salient (cf. Bousfield and Barclay 1950; Wnuk and Majid 2014). Although speakers are able to generate exemplars, the meaning indicated is the quality of the odor rather than the object literally; just as would be the case if an English speaker were to list all things that are *blue – sky, eyes, robin's eggs,* etc. There is a common property independent of the individual entities listed. Or to put it another way, each verb lexicalizes an abstract odor concept. Translation to English proves challenging for a number of reasons: there is no easy one-to-one gloss, many of the objects may be unfamiliar to

1 Abbreviations used: ART – article; AUX – auxiliar; CAUS – causative; DECL – declarative; DEF – definite; DEP – dependent; DS – different subject; EMPH – emphatic; IND.OBJ – indirect object; INDEF – indefinite; IRR – irrealis; MULT – event plurality; NMLZ – nominalizer; PL – plural; POSS – possessive; REALIS.YO – realis yo- prefix; SBJ – subject; SG – singular; UNSPEC – unspecified.

the reader, and no molecular chemical analysis of the scents exists. Having said that, the material in the following pages provides a bit more context for the use and application of these terms across a variety of contexts.

Table 1: Verbs in the Seri olfactory lexicon and their exemplars as listed by five native Seri speakers (adapted from O'Meara and Majid 2016: 114). Expressions are in their citation form (as per Moser and Marlett 2005): the verbal predicate has the subject nominalized prefix *c-* or *qu-*.

Seri smell predicates	Possible odor emiting sources that can be described by the verb
cheemt	feces, rotten food, dead animals, sea lion, whale, dolphin, shark, things that come from the sea, shoes, dogs, smoke, also used to refer to the odor of a house cleaning product (pine scented, in this case), *xtisil* (an aromatic perennial in the daisy family), skunk, the liver of the (less common) triggerfish that used to be found off the shores of Tiburon Island
casa	same exemplars listed as *cheemt*, but according to one speaker, shows little respect and can be offensive; can also be used in humorous contexts
ccon	smoke, smell of food cooking, spoiled beans, onion, smell when you cook an immature green sea turtle known as *cooyam*
ccozl	when food goes bad, when sweet food goes bad or rancid, such as honey or sweets
quicotj	wet soured clothes, mildewy, musty
quíxepxat	body odor (only of the *Cocsar* 'non-Seri Mexican'), desert lavender (Note that this verb root is archaic, no longer used in daily conversation.)
ccotxta	shirt, clothes, burnt beans, a plant called *hehe ccotxta*, body odor (only from the *Cocsar* 'non-Seri Mexican', and other foreigners)
ix casii	(lit. smell of its liquid) unpleasant body odor of a person, herb called valerian, and other unpleasant odors

Smell verbs primarily distinguish types of unpleasant odors. In fact, there is no specific verb dedicated to pleasant odors; only a construction that involves a nominalized form of the general smell verb followed by the verb root 'be good' (*ihasii quiipe* lit. 'its smell be good'). Smell verbs cannot be characterized as lexicalizing different degrees of pleasantness, but instead differentiate distinct smell qualities. The central meanings (cf. Lakoff 1987: 91–109) of the referentially more specific monolexemic verbs in Table 1 could be characterized as following: *ccon* is used for odors associated with cooking, *ccozl* for rotten or rancid food odors, *quicotj* refers to moldy or mildew odors, *quixepxat* is associated with body odors, and *ccotxta* refers to clothing and body odors.

It is more challenging to identify the central meanings of *cheemt* and *casa*. Table 1 shows that *cheemt* and *casa* elicited a large number of possible exemplars, many of

which overlap. At best these odors can be characterized as referring to unpleasant odors. But, the verbs are not substitutable in use. While *cheemt* can be used in almost any context, *casa* can elicit laughter and surprise from speakers when used in some contexts, perhaps due to its vulgar connotation (as suggested by one speaker, and as observed in conversation). Correspondingly, *cheemt* is more frequently heard in everyday conversation when speakers refer to a general unpleasant smell (e. g., the smell of burning garbage, the smell of dead fish coming in from the beach, etc.). The other six smell verbs in Table 1 elicited fewer exemplars, and likely due to their more restricted referential range are also heard less frequently in everyday conversation. This suggests that among the set of monolexemic olfactory verbs, *cheemt* is likely the most central.

Smell plays an important role in traditional Seri life: odors play a critical role during healing practices, adornment of dwellings and people, as well as in distinctions made between in-group and out-group members (O'Meara and Majid 2016). This latter point is illustrated by the exemplars in Table 1 where some smell verbs are associated with the body odor of non-Seri Mexicans, but not Seri themselves. The elaboration of olfaction in both Seri language and culture is relevant to better understand how smell terms are used in the context of non-literal reference.

3 Olfactory metaphor and metonymy in Seri

The Seri language provides new insights into lesser-described mappings of olfaction onto other domains. The key novel feature is the fact that mappings from olfactory predicates to non-olfactory domains depends upon the specific smell verb involved. In other words, different olfactory verbs in Seri are used metaphorically in different ways – because of their specific smell semantics, terms are not substitutable in their non-literal uses.

Metaphoric extension from the olfactory domain in Seri is found in complex verbal expressions or idioms that contain a smell root which is always preceded by some other element, such as a noun. In general, the Seri lexicon contains various complex multi-morphemic and oftentimes multi-word expressions involving deverbal forms or nominalizations (Marlett 1981; O'Meara 2010), as well as complex verbal expressions and verbal idioms that can be used predicatively. Some verbal idioms include a noun (both common nouns and possessed nouns) in the verb phrase, and others a postposition or adverb in the verb phrase (Marlett 2016). For instance, *hant caacatx* means 'have a baby' but literally translates as 'cause the land to be released'; *iiqui cojoz* means 'suddenly' with the literal translation 'flee toward it'. In these expressions the verb root is the final element, consistent with the Seri language

head-final syntax. Additionally, these verb roots take the standard verbal inflectional morphology found in finite verb forms. It is such expressions featuring smell predicates that will form the bulk of our discussion in the rest of this paper.

We highlight three key elements. First, contrary to the wide-spread attestation of anger being conceptualized as A LIQUID OR GAS IN A PRESSURIZED CONTAINER, in Seri the preferred way to talk about the emotion of anger is that it stinks (in a particular way – i. e., *cheemt*). Moving beyond this specific case, we show Seri smell roots – when used metaphorically – differentially imply volitional vs. non-volitional states of affairs, depending on the verb root. Finally, we illustrate Seri's extensive metonymic use of complex expressions featuring smell to name plants, animals, and artifacts.

3.1 Anger stinks in Seri

There is a long history of metaphor research on emotion (e. g., Kövecses 1986, Kövecses 1990; Palmer and Occhi 1999; Yu 1995), with the oft-cited claim that emotion is a particularly common target domain for metaphor (Kövecses 2000: 21). Emotions are typically considered to be abstract, and so are said to be expressed as metaphors; i. e., in terms of more concrete domains (Lakoff and Johnson 1980). Based on metaphorical expressions in various languages, it has been claimed that anger is conceptualized via mappings from bodily experience and force dynamics as A HOT LIQUID OR GAS IN A PRESSURIZED CONTAINER (Kövecses 1986, Kövecses 2000; Lakoff 1987). Expressions like *he was boiling with rage*, *I'm going to blow a gasket*, or *she was brimming with anger* indicate that body heat and blood pressure rise when people are angry (Dancygier and Sweetser 2014: 28–29).

This metaphor – or a variant thereof PRESSURIZED CONTAINER – is claimed to be cross-linguistically ubiquitous based on data from English, Hungarian, Japanese, Chinese, Zulu, Polish, Wolof, and Tahitian (Kövecses 2000, Kövecses 2010). While there is language-specific variation in the manifestation of the metaphor in each language, nevertheless the same basic container metaphor emerges: anger is conceived of as a contained liquid or gaseous substance, it is often hot, and thus under pressure within the container. The Seri data presented here do not substantiate this pattern. Metaphorical conceptualization of anger for the Seri does not involve a substance within a container, nor a substance under pressure, nor is temperature relevant. Instead, to be angry in Seri is to have a stinky soul.

Before we explore this in detail, we add some more information about the expression of emotions in Seri. Seri speakers describe basic emotions through verbal idioms. The general pattern is having a possessed noun followed by a verb form. For example, the emotional state of being angry is expressed by the

verbal expression *iisax cheemt* (lit. 'its spirit stinks'; see Table 2), which involves a smell verb that modifies the possessed noun for spirit, whose possessor is the individual experiencing the emotion. The verbal idioms used to describe basic emotions in Seri can be found in Table 2.

Table 2: Verbal expressions for emotions. No literal translation is provided for the final two expressions because the meaning of the verb is not transparent.

Emotion expression	Free Translation	Literal Translation
iisax cheemt	'be angry', 'be disgusted'	its spirit stinks
iisax hant cooit	'be happy'	its spirit lands
iisax caanj	'be surprised', 'be afraid'	its spirit ?
imoz cmeet	'be sad'	its heart ?

To use these verbal expressions, the speaker changes the possessive marking on the possessed noun (e. g., *iisax* 'its spirit') to indicate who is experiencing the emotion, for instance *Miisax cheemt iha* 'You are angry' where *mi-* is the second person possessive prefix and *iha* is the declarative marker. All of the verbs in these expressions are intransitive and the possessed noun is the subject. In the verbal idioms used to describe emotion, the individual components of the expressions cannot be understood literally – someone's spirit cannot actually stink. According to Seri ideology all people have a spirit. As such, this expression involves metonymy where a part (spirit) stands for the whole (person). More interesting in this context is the metaphoric mapping of the negative property associated with the olfactory root *-heemt* to the emotional domain, specifically anger. To our knowledge, this is the first reported case of a metaphoric extension from olfaction to a specific emotion (as opposed to general negative affect; cf. Anderson 2019; Esenova 2011; Kövecses 2019; Sweetser 1990; Ibarretxe-Antuñano 1999a, Ibarretxe-Antuñano 1999b).

The *iisax cheemt* expression is heard in everyday conversation and appears in texts (3) as a way to express anger.

(3) *Ox itapactoj x,*
so 3;3.DEP.REALIS.do.PL UNSPEC.TIME
cöitjcoaalam ma x, ***iisax***
3IND.OBJ.DEP.REALIS.throw.at.PL.MULT DS UNSPEC.TIME 3POSS.spirit
theemt *x...*
DEP.REALIS.stink UNSPEC.TIME
'When they did it like that, when they hit him, he was angry...' (Sei_Hajhax_JM 34)

It is also the expression used to describe basic vignettes where an individual becomes angry and the basic emotion facial expression that corresponds to anger (following the stimuli in Levinson et al. 2007). We also elicited vignettes where an individual experiences increasing and decreasing levels of anger and speakers almost exclusively used this expression, sometimes together with the adverb *anxö* 'very' or with the negative prefix *m-*. This targeted elicitation did not result in alternative expressions of anger or evidence that speakers conceptualize anger as a liquid or gas under pressure. Rather, we documented expressions indicating that Seri speakers likely conceptualize anger, *iisax cheemt*, in terms of quantity.

To specify that someone got angry as a result of something, another expression derived from *iisax cheemt* is used, *iisax caheemotim* 'get angry at'. This is the causativized form of *iisax cheemt* with the multiple event suffixation, so it literally means 'cause its spirit to stink multiple times'.

(4) *Carolyn quih* ***iisax*** ***caheemotim*** *iha*.
Carolyn DEF.ART.UNSPEC 3POSS.spirit SBJ.NMLZ.CAUS.stink.MULT DECL
'Carolyn got mad (at something in particular).'

There are other ways to describe being angry in Seri, beyond what we have seen so far; for instance, the transitive verb, *quixpx* 'get angry at', illustrated in (5). The object of the verb is the person the subject is angry with.

(5) *Kika quih Marta quih* ***iyoxpx***.
Kika DEF.ART.UNSPEC Marta DEF.ART.UNSPEC 3;3.REALIS.YO.get.angry.at
'Kika got angry at Marta.'

There is also a verbal expression to indicate someone is irritable or has a tendency to get angry easily, *iisax cantaxalim* 'be irritable' that has formal similarities to 'its spirit stinks'. This expression involves a possessed noun *iisax* 'its spirit' and an intransitive verb whose meaning in isolation is not clear, but which we translate as 'irritable' here.

(6) *Carolyn quih* ***iisax*** ***cantaxalim*** *iha*.
Carolyn DEF.ART.UNSPEC 3POSS.spirit SBJ.NMLZ.irritable DECL
'Carolyn is irritable / tends to get angry.'

We see from these examples that although Seri has a number of strategies for talking about anger, *iisax cheemt* 'its spirit stinks' is the most general means to do so. This raises the question of what motivates this expression. Many scholars

have pointed to the close relationship between odors and emotion. For example, Yeshurun and Sobel (2010: 233) state that "the principal axis of human odor perception remains pleasantness", where pleasantness is the common link between olfaction and emotion. They claim the strong link between odor and emotion is what allows people (or any organism) to make a swift response to an entity: if it smells bad, avoid it; if it smells good, approach. Others have pointed to the close link between odors and memory. For example, Herz et al. (2004: 377) suggest that odors are responsible for eliciting more emotional memories than images or words. There is also evidence that olfaction and emotion activate the same areas of the brain (Soudry et al. 2011). This is consistent with resemblance being the basis for the grounding of metaphors like EMOTION IS SMELL (Kövecses 2019) where emotion resembles perception. More specifically, grounding is based in the physiological similarities shared between olfactory and emotion experiences.

However, the Seri expression *iisax cheemt* is not simply a case of the BAD IS SMELLY metaphor that has been described previously (e. g., Kövecses 2019; see also Esenova 2011). In Seri, to stink is not to have a general negative emotion, but *cheemt* 'stink' is mapped to a specific type of emotion, i. e., anger. It is not used to mean 'sad', for example; nor as a general expression of unpleasantness. It should be noted, however, that there is an overlap between anger and disgust. The term *iisax cheemt* can be used to describe some situations of disgust. For example, when Seri speakers are presented with photos depicting different emotion-specific facial expressions and are asked to describe them (Levinson et al. 2007), speakers described both 'anger' and 'disgust' facial expressions with *iisax cheemt*, suggesting that there is lexical conflation of these emotional states. This is not so unusual; other languages have also been shown to conflate anger and disgust lexically (e. g., Yucatec Maya; Sauter et al. 2011).

Nevertheless, observational data confirm that canonical uses of *iisax cheemt* in conversation predominantly mean 'be angry'. Seri speakers use this expression to describe emotional responses by individuals during community conflict, and when children get upset with each other while playing. This interpretation is further bolstered by responses in elicitation to emotional responses in targeted vignettes (Levinson et al. 2007), where *iisax cheemt* is used to describe scenarios involving indignation and anger. For example, in one scenario a person is accused of being lazy by their father after coming back from a long day of hard work in the company of friends, and in another a favorite keepsake is broken by a boy in the village. Both scenarios elicited *iisax cheemt*.

The overlap between 'anger' and 'disgust' provides a possible bridging context between *cheemt* and anger. There is well-attested evidence for a close link between olfaction and the emotion of disgust specifically (Bensafi et al.

2002; Croy et al. 2011). Offensive smells give rise to facial expressions of disgust even in very young infants (Schaal 2017), and people from diverse cultures display facial expressions of disgust to the same odors (Majid et al. 2018). At the same time, it has been shown that anger and disgust facial expressions can be difficult to distinguish, especially in early facial expression processing (Jack et al. 2014) which can lead to these being conflated.

There is also a close experiential relationship between 'disgust' and 'anger'. For example, Alaoui–Ismaili and colleagues (1997) gave people pleasant and unpleasant odors, and measured both verbal and physiological responses to each smell. They found that people described unpleasant odors as *disgusting*, but the simultaneous physiological measures (e. g., skin resistance, skin blood flow, instantaneous heart rate) were consistent with the experience of anger. In a separate line of inquiry, Izard (1977) also notes a close relationship between 'anger' and 'disgust' (as well as 'contempt') and suggests these emotions are often experienced together in day-to-day interactions as a triad of moral emotions. Together, all this suggests a possible experiential correlation of unpleasant smells and anger, likely mediated through disgust.

To summarize, the Seri data suggest the PRESSURIZED CONTAINER metaphor for anger does not apply in this language. Instead, all the available data confirm the primary way to express anger in Seri is that it stinks (in a particular way). At the same time, the linguistic expression of this metaphor is limited: it only appears in the expression *iisax cheemt* and its causativized counter-part *iisax caheemotim*. In addition, other negative emotions such as sadness and fear are not described with verbal idioms with olfactory verbs in Seri: *imoz cmeet* 'be sad' (lit. 'heart that is ?') and *iisax caanj* 'be surprised, be afraid' (lit. 'spirit that is ?') (see Table 2). So, the mapping of odors to emotions is not a systemic mapping across the two fields.

Psychologists point to the close relationship between odors and emotion, but the Seri data highlight that the mapping can also be specific. This case study shows how valuable data from lesser-described languages can be in both testing existing theories and highlighting novel ways that people can use to conceptualize themselves and their world. In the next section, we explore another interesting way Seri smell language goes beyond its literal meaning.

3.2 Semantic specificity of olfactory verbs and its metaphorical consequences

Outside of the domain of emotion, verbal idioms involving smell roots lexicalize a state, property, or activity, and there is one example of a meteorological verb. For each complex expression in Table 3, a free translation of the Seri expression

is provided in English followed by a literal translation, and a column with information related to the cultural relevance of the term or its referent, when applicable. The majority of the complex expressions are formally transparent to native speakers (i. e., speakers can identify the parts of the expression and the literal meaning when prompted). The expressions also follow the regular syntactic patterns of the language.

Table 3: Verbal expressions involving smell roots that refer to states and activities. (Translations verified in Moser and Marlett 2005; additional cultural information compiled through fieldwork; an anonymous reviewer provided additional information for *ipac casa*.).

Expression	Free translation	Literal translation	Cultural relevance
hant cheemt	'be bad weather' (language of the giants)	land stinks	Used in archaic language of the giants (reserved to stories that involve giants).
ihiim cheemt	'have a nightmare'	his/her sleeping stinks	
iisax cheemt	'angry' (upset)	his/her spirit stinks	
iix casa	'stingy' (archaic expression)	his/her water stinks	The name refers to a man who a long time ago hoarded water. It became putrid, but he did not mind the smell. See *iix casa insii* below.
imoz cöcasa	'detest [food]'	his/her heart where it stinks	
inzaai casa	'do carelessly'	his/her way of doing things stinks	
ipac casa	'be left without family in bad conditions'	its back stinks	Offensive term.

These complex verbal expressions illustrate the metaphorical mapping of particular properties from the smell domain onto a different domain. With respect to the verbal expressions *imoz cöcasa* 'detest food', *iix casa* 'stingy', *inzaai casa* 'do carelessly', *ipac casa* 'be left without family in bad conditions', *hant cheemt* 'be bad weather' and *ihiim cheemt* 'have a nightmare' (Table 3), we see metaphorical mappings between a negative property of the experience encoded in the olfactory verbs *casa* or *cheemt* onto the experience or action described by the complex verbal expressions. This echoes the observations of Sweetser (1990:

37) and Ibarretxe-Antuñano (1999a, 1999b) that smell indicates 'dislikeable' feelings or characteristics. So, smell properties or qualities are likened to properties or qualities of people and states of affairs, as described for other languages without elaborate smell lexicons.

In a distinct pattern in Seri, some verbal idioms take one smell verb *casa* and others *cheemt*. This appears motivated by a semantic distinction between the verbs, namely whether volitional or not. In general terms, smelling is not a voluntary or volitional activity, but something that happens whenever we breathe – an incidental activity. At the same time, it is possible to actively sample air, for example, with the intention of checking whether something is edible. Utterances conveying smelling events can therefore have active or non-active subjects to distinguish the voluntariness of a given perceptual experience (Ibarretxe-Antuñano 1999a). In Seri, we see this distinction reflected in how some smell verbs are metaphorically mapped. In particular, *cheemt* is used in expressions that depict non-volitional or passive states of affairs (e. g., being angry or having a nightmare) while *casa* is used for volitional or active states of affairs (e. g., being stingy or doing something in a careless manner). Although this distinction of volitionality does not arise in literal uses of Seri smell verbs, its appearance in these expressions is likely a result of the pragmatics of these verbs. So, the fact that *casa* carries a more vulgar connotation compared to *cheemt* is reflected in the metaphoric uses of these two verbs. The more pragmatically loaded verb is mapped to more volitional contexts.

3.3 Olfactory metonymy for natural kinds

Even though the meanings of the components of complex nominal and verbal expressions are known to Seri speakers, the meaning of the expressions themselves cannot be predicted based on the literal meaning of their parts. The Seri data confirm that there are differing degrees of opacity in the meaning of idioms – some are completely opaque, while others can be decomposed through a post-hoc analysis of the meaning of their parts (O'Grady 1998). Previous studies have analyzed the meaning of idioms as metaphoric or metonymic (see, e. g., Kövecses and Szabó 1996); here we focus on olfactory metonymy used in complex nominal expressions that name natural kinds.

The previous sections have focused on examples of verbal idioms and their metaphorical extensions but complex nominal expressions in Seri can also be analyzed as idioms (following Marlett 2016). The syntactic heads of such expressions frequently consist of a nominal with general referential properties followed by a lexical item that further restricts its reference. Nominalized forms in multiword expressions in Seri have a similar function as relative clauses in English.

For example, *hehe casa* which refers to a scrub in the legume family [*Desmanthus fruticosus*] has the head *hehe* 'plant' and is modified by the subject nominalized form *casa* 'that stinks' (see Table 4, below). These expressions are transparently decomposable to native speakers and are not specific to one lexical field, but rather are found in countless terms used to refer to plant species, artifacts, and even place names. Examples are not limited to binomial combinations, e. g., *hehe iti icoohitim* 'table' (lit. 'wood on which one eats') or *Hast Hantip Quih Iti Iihca* which is the name of a place on Tiburón Island (lit. 'hill where there is salt').

The majority of complex nominal expressions that contain olfactory predicates in Seri refer to different kinds of plants. Table 4 lists them all, including four expressions that contain a form of the general smell root *csii*, three also contain a form of the smell verb *casa*. Two other plant names contain only the verb *casa*. Given the restricted use of *-asa* as a finite verbal predicate (see Table 1), it is noteworthy that it occurs in at least 10 lexicalized complex expressions (Tables 2–4). Among plant names there is also a minimal pair where the same nominal *hehe* 'plant' combines with two different smell roots – *hehe casa* 'a scrub in the legume family' and *hehe ccon* 'onion' – resulting in names for two different plant species.

To better understand these complex nominal expressions, let us consider examples of minimal pairs where one of the pairs has an olfactory predicate and the other does not. Take, for example, the plant name *haapis casa* 'coyote tobacco' (*Nicotiana trigonophylla*), which literally means 'tobacco that stinks'. The plant reportedly has unpleasant smelling leaves. This type of tobacco contrasts with *haapis cooil*, which literally means 'tobacco that is grue (green/blue)' and is used to refer to marijuana. Or, consider *haapis copxöt* 'tobacco', which literally means 'tobacco that is loose', presumably related to the fact that this tobacco was usually sold in packages of prepared loose leaves. These examples suggest that olfactory predicates are functioning on par with color and dispositional predicates in the naming of kinds of things. So, the aromatic property of the leaves provides a distinguishing property.

As discussed in Section 2, the central meaning of *ccon* concerns cooking-related odors. It is not surprising then that the semantic extension in *hehe ccon* 'onion' remains in the same conceptual domain. Similarly, Table 4 provides additional insight into the ways cultural myths and beliefs provide a context for chaining olfactory properties to particular events or properties of objects in the world (following Lakoff 1987).

In addition to naming plants, complex nominal expressions featuring smell in Seri refer to an insect (earwig), an introduced domesticated animal (cow), and an introduced artifact (makeup powder) (Table 5).

Table 4: Nominal expressions for plants that involve a smell verb (translations verified in Moser and Marlett 2005; additional information compiled by authors).

Expression	Free translation	Literal translation	Cultural relevance
caasol ihasii quiipe	'desert chinchweed' (*Pectis papposa*)	*caasol* that smells nicely	Has bright yellow flowers and very pungent foliage. Its abundant flowering indicates hot weather and soil moisture (Felger and Moser 1985: 285).
cotx	'brittlebrush' (*Encelia farinosa*)	what has an acrid smell (derived from *-cotxta*)	Medicinal use, used in construction of windbreak (Felger and Moser 1985: 283).
haapis casa	'coyote tobacco' (*Nicotiana trigonophylla*)	tobacco that stinks (*-asa*)	The leaves are said to smell bad, but men travelled far to harvest leaves of this plant in order to smoke them (Felger and Moser 1985: 369).
hehe casa	'a scrub in the legume family' (*Desmanthus fruticosus*)	plant that stinks (*-asa*)	In olden times, Seri strung flowers and leaflets for necklaces. Tea made from roots was used to cure soars in the mouth. Crosses made from twigs were hung on necklace to ward off sickness (Felger and Moser 1985: 327).
hehe ccon	'onion' (*Allium cepa*)	plant that stinks (*-con*)	Introduced domesticated plant
iix casa insii	'satiny milkvetch' (*Astragalus magdalenae*)	the one who does not smell his putrified water (*-asa*)	The name refers to a man who a long time ago hoarded water, it became putrid but he did not mind the smell. In modern times, kids ask folks to smell this plant and if folks say it does not smell, it means they are stingy (Felger and Moser 1985: 323).
ziix casa insii	'alkali weed' (*Cressa truxillensis*)	that which does not smell the thing that stinks (*-asa*)	Alternative name for alkali weed, which has a very objectionable odor.
ziix hatc casa insii	'alkali weed' (*Cressa truxillensis*)	that which does not smell the testicles of the thing that stinks	Name refers to a camp on the shore of Tiburon Island where long ago a man had a diseased testicle (Felger and Moser 1985: 287).

Table 5: Nominal expressions that contain smell roots and name objects that are not plants (translations verified in Moser and Marlett 2005).

Expression	Free translation	Literal translation	Cultural relevance
ziix yacop casa	'earwig' (*Dermaptera*)	thing whose stinger stinks	Most likely linked to the sulfides released by the earwig as a predatory defense mechanism, which have a strong smell (Byers 2015).
hant csii	'cow'	land that (one) smells	Introduced domesticated animal
ziix ccotxta	'makeup powder'	thing that smells like body odor	Introduced artifact

These examples illustrate metonymy at play: smell properties are used to specify reference to particular plant species, insect species, animal species, and artifacts. This seems to indicate that these are not "one off" uses of metonymy (like *spill the beans* in English – since the use of *beans* to mean 'knowledge' does not exist elsewhere in English). Rather, olfactory verbs were used in the recent past to coin new expressions in order to name items introduced to Seri culture.

In some of the examples we see categorial metonymy, where a particular property of the referent is highlighted in order to make reference to the category. This is the type of metonymy that is used in expressions like *he married money*, where *money* refers to the fact that the spouse has money, not that money is part of the spouse (Littlemore 2015: 20). In Seri, plant names refer to particular kinds of plants, primarily based on picking out perceptual characteristics of these plants, where smell is used metonymically to make reference to a kind of plant species, e. g., *caasol ihasii quiipe*, literally '*caasol* that smells nice'.[2] Here, the expression is used to refer to the plant 'desert chinchweed' (*Pectis papposa*) which has fragrant flowers. It is possible this particular species is named in contrast to others by foregrounding its olfactory properties, specifically, the pleasant smell that it emits.

A similar example is illustrated with the plant *cotx* 'brittlebrush' (*Encelia farinosa*) which has a very pungent smelling resin when the stems are broken. While the resin is clearly part of the plant, the smell of the resin is the property highlighted in the name, not the resin itself. The expression *ziix yacop casa* 'earwig' (lit. 'thing whose stinger stinks') provides another example. As with the plant names, the odor which its name makes reference to is emitted by a part of the insect; in particular, the pincers (or *yacop* 'its stinger') of the earwig are

2 *Caasol* is opaque here; it only occurs in complex nominal expressions.

responsible for emitting a foul odor. This example illustrates the intimate knowledge Seri people have of insects, and the biological world around them.[3]

Other examples are best analyzed in terms of frame metonymy (Dancygier and Sweetser 2014: 5); for instance, where an unpleasant smell of a particular plant is linked to a historical event, as is the case for the name of the plant *iix casa insii* 'satiny milkvetch' (*Astragalus magdalenae*). This expression is linked to the archaic verbal idiom *iix casa* 'be stingy' in that it involves the verbal idiom inside of the nominal expression and both expressions seem to be linked to the same story. The event described in the story has to do with a man who discovered an important fresh water hole on Tiburon Island. He was a stingy man who hoarded fresh water from other people, and over time his water became putrid and stinky. He did not mind the smell of the putrid water and still drank it. This is how *iix casa* 'its putrid water' is linked to being stingy: the man who was stingy (by hoarding his water) had a water hole with stinky water. In the case of the verbal idiom *iix casa*, there is a base metaphor that stinking is an unpleasant property. The frame metonymy operates on top of that and results in the meaning of the nominal expression. The smell of the plant *iix casa insii* 'satiny milkvetch' (lit. 'the one who does not smell his putrid water') is linked to the story of the man, and the fact that he was stingy with his (stinky) water. It is said that if a person cannot detect the smell of the satiny milkvetch as stinky, they are stingy – just like the man in the story.

4 Discussion

It has been claimed that olfaction is a relatively poor source domain for metaphor and metonymy (e. g., Ibarretxe-Antuñano 1999a, Ibarretxe-Antuñano 1999b; Sweetser 1990; Viberg 1984); however, in this paper we highlighted numerous ways in which Seri displays metaphorical and metonymical extension where olfaction is the source domain. The case of Seri olfactory metaphor is of particular interest given that Seri has a more elaborate smell lexicon than languages like English, offering the potential for more varied kinds of semantic extension. In fact, Seri displays distinct patterns of extension depending upon the particular smell verb used, suggesting, perhaps, that there is more metaphoric potential for olfaction in languages with more extensive olfactory vocabulary.

3 See also Felger and Moser (1973) regarding the knowledge Seri have of the green sea turtle's diet and feeding patterns as an additional example.

Seri smell vocabulary is dominated by verb roots that lexicalize unpleasant smells; correspondingly metaphoric extension from the olfactory domain in Seri tend to map negative properties to the target domain. This is akin to what has been reported in other languages without elaborate smell lexicons (Anderson 2019; Kövecses 2019; Sweetser 1990; Ibarretxe-Antuñano 1999a, Ibarretxe-Antuñano1999b; Neagu 2013; Evans and Wilkins 2000; Fernández Jaén 2012). To the extent that similar patterns attested in majority languages appear in small-scale lesser-described languages – whose speakers live in a different cultural milieu – we can have more confidence in previous generalizations. The Seri data therefore lends further support to the existence of a general metaphor where smell is used to indicate negative feelings, characteristics, or states of affairs (Ibarretxe-Antuñano 1999a, Ibarretxe-Antuñano1999b; Sweetser 1990).

We also found examples of novel olfactory metaphors where olfactory verbs in idiomatic expressions have more semantically specific meanings than has been previously described in studies of olfactory metaphor. Specific target domains include: emotional states (e. g., being angry), weather (e. g., being bad weather), unconscious states (e. g., having a nightmare), enjoyment of food (e. g., detesting food), activities (e. g., do something carelessly) and marital or familial status (e. g., leaving someone without family). At the same time, we do not find the domain of smell mapped onto areas that have to do with suspecting or guessing (as in French and Romanian; Neagu 2013) or with the areas of investigation or trailing (as reported for English, Spanish, and Basque; Ibarretxe-Antuñano 1999a, Ibarretxe-Antuñano 1999b; Sweetser 1990). We also do not find instances of olfactory verbs used as predicates in finite clauses meaning general badness or indicating negative properties comparable to *that stinks* in English; the use of olfactory verbs in such contexts involves the literal meaning of the verbs.

The most striking case of olfactory metaphor in Seri is that anger can be conceptualized in terms of an unpleasant smell. Earlier literature has concluded that there is a universal tendency for anger to be conceptualized as a liquid or a gas (under pressure) in a container (Kövecses 1986, Kövecses 1990, Kövecses 2000, Kövecses 2010; Palmer and Occhi 1999; Yu 1995) but recognizes cultural variation (Kövecses 2005). This analysis does not hold for Seri where anger stinks instead. One possible motivation for the ANGER IS A STINK metaphor is that the physiological symptoms of anger can be elicited by unpleasant smells in some circumstances (Alaoui-Ismaili et al. 1997). This can be the case even when people verbally report feeling disgusted. Similarly, facial expressions of disgust and anger can be easily confused (Jack et al. 2014). This provides a possible bridging context, but still does not definitively answer the question of why this specific odor term became lexicalized for this purpose.

It also raises the question of how unique this type of metaphorical expression is. These examples illustrate an overlooked strategy that smell terminology can figure in non-literal usage, and prompts a closer look at familiar languages for possible parallels. A brief foray into English shows there is, indeed, something akin to the ANGER IS A STINK metaphor in expressions like *to raise/kick up/cause a stink*, as in this example: *"Partly out of necessity, and partly out of a desire* ***to cause a stink****, he put the much-loved Holbein on to the market ... . There was an outcry."*[4] Or *The first thing he'd do when he got back was see his M.P. and* ***kick up a stink****.*[5] Here, the expressions mean to 'cause a furor' and imply anger and outrage, particularly a public outcry. English *stinker*[6] is documented as a term used by sailors in the nineteenth and twentieth century to refer to giant fulmar (*Ossifraga gigantea*) and other ill-smelling petrels, as well as for strongly worded letters, disagreeable reviews or other communication (e. g., *I was afraid ... that you would write me a* ***stinker*** *calling me a peach fed sod.*). Likewise, there appears to be an analogue in Thai where the olfactory verb *chŭn* 'be strong smelling' can be metaphorically extended to mean 'be angry' or 'be irritable', and when the verb *měn* 'experience stink' combines with *bʉa* 'be bored' the combination results in the meaning 'be fed up with something or someone' (Wnuk et al. forthcoming). So, the mapping of smell specifically to anger (and a constellation of related emotions) – rather than broadly to negative valence – appears to be more widespread than previously thought.[7] These tantalizing bits of evidence call for a more systematic analysis of ANGER IS A STINK metaphors across languages.

Metonymy has been said to be pervasive in cognition and more cognitively basic than metaphor (Dancygier and Sweetser 2014: 123). It is surprising then that metonymy does not figure more strongly in previous discussions of semantic extension from the perceptual domain. The Seri data presented here illustrate cases of both categorial and frame metonymy in complex nominal expressions that primarily name natural kinds. There are minimal pairs of

4 From the Guardian newspaper https://www.theguardian.com/books/2001/dec/01/classics.artsandhumanities.

5 From OED, 1959, M. Cronin Dead & Done With iv. 56.

6 "stinker, n.". OED Online. June 2017. Oxford University Press. http://www.oed.com/view/Entry/190411 (accessed August 11, 2017).

7 Esenova (2011) also identifies a metaphor which is dubbed ANGER IS A BAD SMELL, for example: *he reeked of anger*. Here an unpleasant emotion is simply conceptualized in terms of an unpleasant odor. The metaphor is used to capture the negative evaluation. The smell term *reek* is simply the negative evaluation, *anger* is explicitly mentioned. This is quite different to the examples described above where the odor term in the expression gives rise to the interpretation of anger.

complex expressions with different nominalized verb forms. For instance, *haapis casa* 'coyote tobacco' (*Nicotiana trigonophylla*) which literally means 'tobacco that stinks' vs. *haapis cooil* 'marijuana' which literally means 'tobacco that is grue'. Just as color and other visually perceivable properties can be used to distinguish types of objects, smell can be used similarly in Seri. The fact that smell is on par with other perceptual parameters has been pointed out previously in ethnobiological research, specifically as it pertains to the semantic dimensions of contrast that exist between different plant taxa, including "color, relative size, shape, habitat, habit (of growth), taste, 'sex', smell, and analogy with some object" (Berlin 1992: 107; see also Daly and Shepard 2019).

It is highly likely that these sorts of olfactory expressions for natural kinds are pervasive in other languages too. In English, *stink-horn*[8] is used to name various ill-smelling types of fungi; *stink-pot*[9] as a way to name the musk turtle (*Sternotherus odoratus*), known for emitting a stinky odor from its scent glands as a defense mechanism; and *stink bugs* is the general term used for some insects from the *Pentatomidae* family, known for giving off an unpleasant odor when crushed. This brief foray indicates that olfaction's metonymic and metaphoric potential – even in major languages – has still to be fully understood, and that exploration of lesser-studied languages can prompt researchers to uncover patterns that may otherwise remain overlooked.

It is important to keep in mind that smell is of high cultural significance to the Seri, as can be seen, for example, by the role it plays in adornment of self and dwellings, distinguishing the way Seri people smell from others, and in medicinal practices (see O'Meara and Majid 2016). Smell has also made its way into traditional stories, and as such, is part of general cultural knowledge of the people, exemplified by the constellation of meanings behind *iix casa insii* 'satiny milkvetch' (*Astragalus magdalenae*) and *iix casa* 'be stingy'. The name of the satiny milkvetch plant was coined via a story of a stingy man who hoarded putrid water. These cultural motifs shed further light on the importance of olfaction in Seri culture, and call for more in-depth investigation of the role of sensory perception in oral tradition cross-culturally.

8 "stink-horn, n.". OED Online. June 2017. Oxford University Press. http://www.oed.com/view/Entry/190413 (accessed August 11, 2017).

9 "stink-pot, n.". OED Online. June 2017. Oxford University Press. http://www.oed.com/view/Entry/190421 (accessed August 11, 2017).

5 Conclusion

To conclude, studies of languages with semantically specific perceptual vocabularies illustrate the diverse means by which perceptual experiences are described and conceptualized cross-linguistically. In exploring olfactory metaphors, we discovered Seri speakers use smell to talk about anger. They also use smell properties to specify reference to different plant, animal, and insect species, something that has been underdescribed in the literature. More data needs to be analyzed from languages with extensive smell vocabularies to explore metaphoric and metonymic extensions from the olfactory domain to determine if the patterns described here are indeed representative of a wider trend that has simply been overlooked. This is imperative because exploring data from understudied languages can provide new perspectives on what can otherwise be thought of as well understood areas of language and thought.

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