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# A semantic typology of emotion nouns in Australian Indigenous languages

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## ABSTRACT

In this article, we analyze lexicographic material for emotion nouns in a sample of 57 Australian Indigenous languages, with a view to understanding the lexical prevalence of different emotions. Several prominent semantic clusters can be identified in the sample, centred around the notions: ANGER; FEELING; SHAME; LOVE; FEAR; and SORROW. After presenting the semantics and shared features of these clusters, we look to colexifications between emotional and non-emotional meanings. Two prominent patterns of colexification arise in the data: behavioural metonymies; and associations with internal body parts. Taking the view that colexifications can be indicative of diachronic semantic change, we suggest these patterns reflect semantic pathways of emergence. We also consider what principles may explain why a given emotion category is prevalent cross-linguistically. Semantic pathways may represent an underlying factor in the selection of categories, where an emotion is associated with significant social behaviours; or figuratively with an abdominal body part (seat of emotion). It is unclear whether the “primary” status or cultural salience of certain emotions has some impact on the prevalence of emotion nouns in Australian languages. These initial results pave the way for future research into the emergence and spread of emotion vocabulary across languages and across word classes.

## ARTICLE HISTORY

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## KEYWORDS

Australian Indigenous languages; colexification; emotion nouns; lexical semantics; semantic pathways

## 1. Introduction

### 1.1 *Are some emotions more often lexicalized than others?*

The observation that languages cut reality at different joints is one aspect of language that triggers intense popular and scientific interest (cf. Evans & Sasse, 2003, pp. 8–9; Lewis, 1984, p. 277). From this observation stem the core questions asked by lexical typologists: How do languages split the world into words, and why do they do it in the way they do (Evans, 2010; François, 2022; Koptjevskaja-Tamm et al., 2007)? In the past decades, much light has been shed on these questions within certain semantic fields (see Koptjevskaja-Tamm et al., 2007 for an inventory). Kinship classes or body parts, for

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example, are lexical categories that lend themselves well to cross-linguistic comparison. Kinship classes can be defined via a small set of structural features (e.g. Nerlove & Romney, 1967); and the human body offers a quasi-universal frame, on which words' denotations can be delineated, and then compared (e.g. Koch, 2008).

Cross-linguistic comparison becomes more complicated with domains where words' referents are less amenable to componential analysis or visual demonstration, as with temperatures (Koptjevskaja-Tamm, 2015). At the same time, such domains are perhaps more interesting in terms of lexical typology because they offer opportunities to study how human minds organize the world in situations where nature does *not* propose an easily accessible, universal blueprint. Recently, Majid et al. (2018) examined the semantic domain of smell, exploring which factors determine linguistic patterns and variation in the ways smells are labelled, and particularly how universal cognitive factors articulate with cultural factors. With similar questions in mind, in this article we focus on emotions, which we define as internal states with a cognitive dimension (i.e. not behaviours, nor sensations like feeling cold or hungry), and an appraisal dimension, which distinguishes emotions from purely intellectual states such as knowing.

From earlier work on the lexical semantics and lexical typology of this field, we already know that languages across the world vary substantially as to which types of emotional experience they label using individual words (Jackson et al., 2019; Majid, 2021; Ogarkova, 2013; Ponsonnet, 2016; Wierzbicka, 1999). However, we do not know much about the scope and limitations of this variation, or about universal tendencies that endure within it. For instance, are some emotional categories lexicalized more frequently than others across the world's languages? That is, do certain emotions – perhaps feeling good/bad, being afraid, or being angry, as suggested by some earlier studies (Ponsonnet, 2022b) – attract more words than others cross-linguistically? If some emotions are indeed more prevalent than others, why is this so? In this article, we begin to explore the questions of the possible lexical prevalence of certain emotions against others, and what drives this prevalence.

## ***1.2 Assessing the lexical prevalence of emotions among Australian nouns***

Asking which emotions are more often named in the world's languages may seem relatively simple, but answering this question is empirically challenging. Emotion lexica are usually extensive, and typically include subtle, often overlapping and/or nested categories, making translation a delicate if not slippery exercise. As a result, cross-linguistic comparison can be risky, especially for linguists working on languages they are not fluent in. Comparing the degree of lexicalization of different emotion categories, across word classes, for a large number of typologically and geographically distant languages is not unfeasible, but it is certainly ambitious and resource intensive.

Before we can tackle this longer-term task, an effective way to gain initial insights about the lexical prevalence of emotion categories is to narrow the question down to certain word classes, particularly of smaller size. A 2016 pilot study of emotion nouns in Australian languages has indicated that these languages exhibit relatively small sets of emotion words in the noun class: an average of five per language in the pilot sample (Ponsonnet, 2016). Emotional verbs and adjectives, on the other hand, are much more numerous in the same languages (see for instance Ponsonnet, 2014; Ponsonnet et al., 2020).

Having fewer documented emotion nouns is unlikely to be an artefact of incomplete documentation, since emotion noun inventories remain modest even for languages with extensive lexicographic data (e.g. 1,391-page encyclopaedic dictionary for Warlpiri (Laughren et al., 2022)); or for languages where the linguistic encoding of emotions has been thoroughly investigated (e.g. for Dalabon (Ponsonnet, 2014)). This pattern is also not particularly surprising, given that “some Australian languages have scarcely any abstract nouns” (again, abstract concepts being captured in the realm of adjectives or verbs) (Dixon, 1980, p. 272).

The relative scarcity of emotion nouns in Australian languages makes them a favourable ground for our enquiry. Since the emotion categories lexicalized as nouns in Australian languages are comparatively few, the presence or absence of such nouns is more informative than the presence or absence of, say, emotion verbs, which are more frequent in Australian languages generally. Furthermore, nouns are a particularly relevant word class from the point of view of our core research question – which emotions are more often named in the world’s languages – because they imply a higher degree of abstraction (sometimes described as “reification”; see also “objectification” (Bolinger, 1980, p. 69); or “hypostatization” (Lipka, 1977, p. 161; Ponsonnet, 2022a)). They implicitly represent emotions as things or entities (see also Kövecses, 2005; Lakoff & Johnson, 1980), which emotions are not; and as such they encapsulate “objectification” metaphors. Lexicalization is a process of individualization and abstraction of certain aspects of the world; as “objectifying” parts of speech, nouns push the abstraction process inherent to lexicalization one step further. The lexicalization of emotional experience as a noun may be construed as an “extreme” case of lexicalization, so to speak. The availability of a noun for a given emotion then enables the use of metaphors that profile very different representations and scenarios, such as the emotion being an agent, a force, a hierarchical superior, and so on (Kövecses, 2000; Ponsonnet, 2014). Consequently, apart from being resource-effective, the study of emotion nouns in Australian languages is also a valid starting point for our enquiry about the lexical prevalence of emotions considered as entities.

### 1.3 Research questions

From our initial question (are some emotions more often lexicalized than others?) follows the question: what drives such preferences in lexicalization? When it comes to explaining regularities in the ways languages carve up the world, usual contenders are nature (or in the case of emotion: physiological and cognitive universals), culture, or language itself (Majid, 2021). Of course, humans are physically and cognitively diverse due to a myriad of factors, among them genetics and environmental factors that impact on human physiology and cognition. Yet it makes sense to ask whether some shared, universal tendencies may be at play when it comes to experience or communication about emotions (Ponsonnet, 2022a). Cultural drives relate to beliefs or lifestyles of human groups. Finally, linguistic pressures relate to the internal organization of language systems, which can favour the emergence of certain linguistic tools against others. Our linguistic study sheds light upon the influence of these pressures by questioning *how* emotion nouns might have emerged, which in turn informs our understanding of *why* they emerge.

Our core research questions can be articulated as follows:

- (a) *Which* emotion categories are frequently expressed by Australian emotion nouns?
- (b) What can we understand about the potential linguistic conditions of their emergence, i.e. *how* do emotion nouns arise in these systems?
- (c) How might these linguistic conditions combine with universal physiological or cognitive pressures, and with cultural pressures, to explain *why* certain emotions are more often expressed by nouns than others?

#### **1.4 What our study does not ask, and what emotion nouns do not tell us**

Our study does not aim to discuss or explain the size of emotion noun inventories in Australian languages. As we shall see, on average Australian languages in our sample have approximately five emotion nouns, however we cannot tell whether this number is comparatively low relative to most other languages in the world. It is certainly lower compared with languages such as French where Mathieu (2000) finds 315 nouns, or Mandarin where Ng et al. (2019) find 92. However, similar “small” inventories have been reported for languages elsewhere (Howell, 1989; Lutz, 1982). Moreover, our study is not concerned with explaining the size of Australian emotion noun inventories, but with the range of emotions they lexicalize (which, as mentioned above, is more feasible with “smaller” inventories).

This study in no way suggests that Australian languages lack any realm of emotion vocabulary. As far as we can tell from languages with extensive lexical descriptions,<sup>1</sup> Australian languages have significant numbers of emotion words generally, particularly among verbs and adjectives. For example, Ponsonnet (2014) documented about 160 emotion words in Dalabon. Thus, our discussions of the emotion categories described by the nouns we found by no means exhaust the emotion concepts lexicalized in Australian languages, and a trend of fewer emotion nouns is not matched in other word classes.

Furthermore, this study does not aim to present the reader with an overview of “Australian Indigenous emotion concepts”. Historically, research in disciplines other than linguistics has sometimes used emotion words, and particularly emotion nouns, as guides to interpret local emotional etiquettes. This method gave anthropologists a head start in the early years of the cross-cultural study of emotions (see Lutz, 1988; Myers, 1979 (on Pintupi group); Rosaldo, 1980). In the linguistic study presented here, we do not assume emotion nouns reflect cultural tendencies or salient shared concepts, but rather *query* whether they do.

Finally, we must note that the data we collected and analyzed, while obviously produced initially by First Nations speakers, were generally filtered by the authors of the sources we consulted, the majority of whom were not Indigenous; and then by ourselves. Neither author is Indigenous (we both collaborate closely with First Nations speakers of Australian languages). Being limited to written lexicographic sources for the majority of languages unfortunately restricts capacity to incorporate a wider range of First Nations voices in the analyses of emotion nouns. We do, nevertheless, respectfully hope that this article may be of interest to First Nations readers, among them perhaps those involved in reclaiming heritage languages.

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<sup>1</sup>E.g. Kaytetye (Turpin & Ross, 2012), Warlpiri (Laughren et al., 2022) and Yolngu Matha (Zorc & Bower, 2012).

## 1.5 Overview

After introducing our methodology in the following section, the organization of the article follows that of the research questions presented in §1.3. Section 3 answers research question (a), by presenting the semantic distribution of emotion nouns. We show that many emotion nouns group into “semantic clusters”, categories based on our observation of semantic patterns in the data (and not some universal or primary concepts), and discuss the largest clusters in further detail. In §4 we turn to research question (b) and highlight two major semantic patterns suggesting pathways of emergence for emotion nouns in Australian languages. These are metonymic associations with certain behaviours, and with certain (internal) body parts. Finally, §5 explores question (c) and the factors driving the observed semantic distribution of emotion nouns. Said section remains largely speculative, but we do show that linguistic conditions (i.e. availability of semantic pathways) are likely amenable factors in and of themselves, although cognitive and cultural salience of emotions may also play a role.

## 2. Methodology

The data for this study draw from the extensive documentation available for Australian Indigenous languages. Lexicographic information was extracted from published and unpublished sources, primarily bilingual dictionaries with English translations, covering a 57-language sample. These sources are listed in Appendix A. We already highlighted the filters imposed on First Nations voices by our data-collection process; here we also note a bias in the metalanguage of the sources: most sources are produced in English. For further discussion of the limitation of lexical documentation specifically in the semantic domain of emotions, see Ponsonnet and Laginha (2020). In §2.1 we discuss our language sample, then our approach to the definition of emotion (§2.2) and the noun/nominal word class (§2.3). In §2.4 we explain what sort of information we drew from the sources.

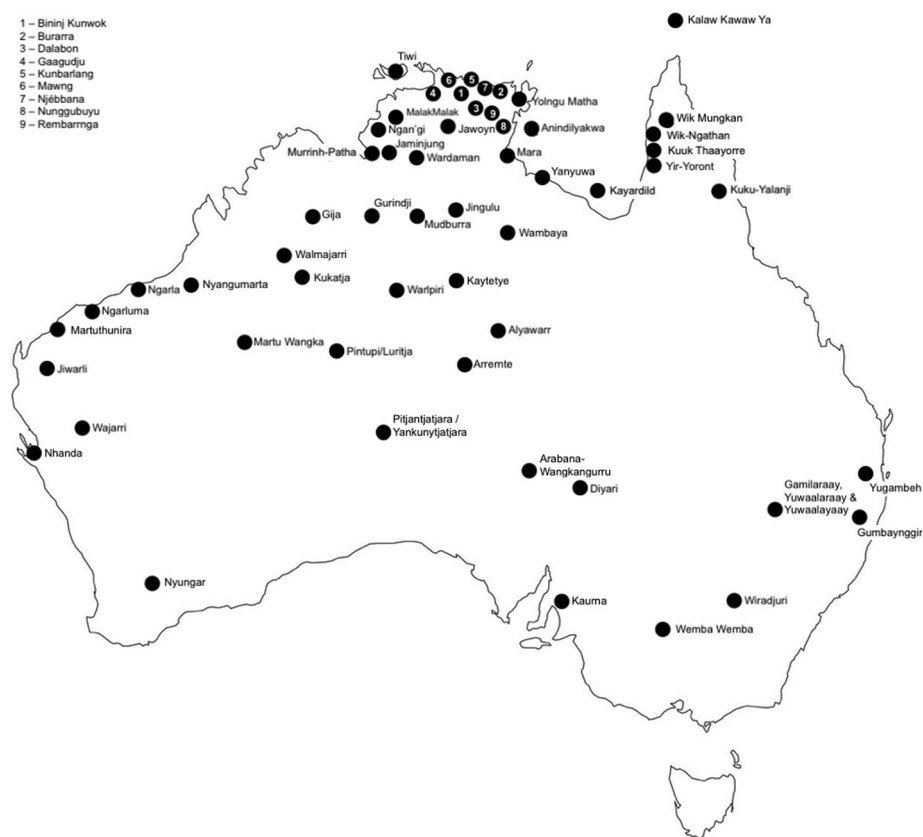
### 2.1 Language sample

We started by selecting rich, accessible lexical sources for a geographically and genetically balanced sample of 100 languages.<sup>2</sup> Given our semantic focus, we had to ensure that the documenter(s) had dedicated enough attention to emotion, and that the word list provided by a given source for a given language was not drastically incomplete due to cursory focus on the emotion domain. To address this issue, only sources listing at least 15 words with an emotional meaning – across any word class – were considered viable. Our rationale, informed by our experience of emotion lexica in Australian languages, was that sources with less than 15 emotion words altogether were likely to have missed several frequent items.

Of the 100 languages initially investigated, 43 did not qualify. The resultant language sample is comprised of 57 languages, documented in 65 corresponding sources listed in

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<sup>2</sup>While the figure may sound small on a continent with several hundred different varieties (Bower, 2023), substantial documentation of emotion words only occurs in extensive lexicographic sources, and these are only available for a portion of Australian languages.



**Figure 1** Map of languages included in the sample

Appendix A. Generally speaking, languages from central Australia and the north of the continent passed the test more frequently, whereas languages of the south, especially in Tasmania, Victoria and central Queensland often failed to meet our documentation requirements. As can be seen in [Figure 1](#), the distribution of the 57 languages retained is still reasonably spread. The genetic distribution remains acceptable as well. The sample does not cover contact languages such as Kriol, Yumplatok or Aboriginal English (although as will be seen in §3.2, there are often semantic resemblances).<sup>3</sup>

## 2.2 Defining “emotion”

The selection of lexicographic entries to include in our dataset of emotion nouns naturally depended on what we define as emotions – a definition on which there is little scientific consensus (Izard, 2010; Wierzbicka, 2010). For this study, “emotions” are defined as internal states with a cognitive dimension, which excludes sensations such as being hungry or cold, as well as a subjective dimension, which excludes purely intellectual

<sup>3</sup>The Torres Strait Island language Kalaw Kawaw Ya is included in the language sample given its relation to Aboriginal Australian languages. We make a point to highlight that this language is spoken by Torres Strait Islander people, who maintain different cultural practices to Aboriginal people. We adopt the term Australian “Indigenous” languages throughout the article for this reason – i.e. to encapsulate both Aboriginal and Torres Strait Islander languages.



states such as “know” or “believe” (Ponsonnet, 2020, pp. 20–23). These exclusions and inclusions are dictated in part by the lexical profile of the languages under scrutiny and in part by the practical needs of the study, such as limiting it to a manageable scale.

### 2.3 Nouns and nominals

When describing a language, assigning parts-of-speech, or deciding whether a given lexeme is better called a “noun”, “adjective”, “verb” and so forth, is based on language-internal criteria informed by cross-linguistic regularities and conventions. The criteria allowing us to identify word classes are language-specific and usually morphosyntactic. The assignment of labels to these classes, on the other hand, follows cross-linguistic semantic conventions, with the label “noun” assigned to the class of words that, in each language, refers to entities most often.

For a large majority of the languages in our sample, our sources explicitly determine a class of nouns. In nine languages, this class contrasts morphosyntactically with a class of “adjectives” and a class of “verbs”. In addition, as is frequent for Australian languages, many sources report just two major morphosyntactic classes: one labelled “nominals” and one labelled “verbs”.<sup>4</sup> For the languages which define a nominal word class, 30 sources delineate a subdivision between noun-like and adjective-like nominals based on various criteria including semantics, thus labelling “nouns” the nominals that normally refer to entities, and “adjectives” those that normally refer to properties. For 18 further languages, however, the sources do not explicitly subdivide the nominal class. In these cases, we chose to reintroduce the distinction on the same semantic grounds as in other sources (as suggested by Dixon, 1980, p. 275, for instance). Nominals that occurred with a noun-like gloss across any area of the data were included. As discussed in §1.2, we are interested in the lexicalization of emotions in word classes that refer to emotions as entities. Therefore, if a nominal is regularly used to refer to an emotion as if it were an independent entity, then it should be included in our dataset. With this in mind, we relied upon glosses and/or translations to implement the decision where authors did not already semantically delineate between adjective-like and noun-like nominals. To illustrate: the Martu Wangka nominal *kaaly*, glossed with the nouns “calmness (referring to feelings); coolness (referring to feelings)” (Marsh, 1992, p. 85) was included. Conversely, Kukatja *lintjarrtju* (nom) “angry, belligerent person wanting to fight” (Peile & Clynes, n.d.) was excluded because it is never translated as a noun that refers to emotion in the data we had access to. Although this method runs the risk of excluding nominals where there is a plausible yet undocumented noun-like translation, our criterion allowed us to make the best of the data available by including the tokens that most routinely refer to entities and excluding those that did not match our semantic requirements.

### 2.4 Lexicographic information

Following the principles outlined above, we identified 299 emotion nouns across 57 languages. For each of them we collated definitions as well as associated examples.

<sup>4</sup>Ten languages also report a coverb or preverb word class. Of these, three report a noun word class. The remaining seven define a nominal word class alongside coverb/preverb and verb.

Most sources had detailed definitions and discussions of the exact meaning of words, and/or provided contextualized examples – all of which we included and treated as data. As often as possible, we consulted additional linguistic sources such as grammars or focused articles and included their information in the dataset. We also systematically consulted anthropological or linguistic publications offering deeper insights into the emotion categories we encountered (Burbank, 1994, 2014; Gaby, 2008; Glaskin et al., 2008; Musharbash, 2010a, 2010b; Myers, 1979, 1988; Peile, 1997; Ponsonnet, 2010, 2011, 2014; Turpin, 2002; *inter alia*). From this information, we grouped nouns according to their meanings. For example, where a noun was glossed with “surprise” (or was attested with this meaning in examples or the literature), a SURPRISE category was created. We then sorted these extensive categories around recurring common meanings, creating the “semantic clusters”. For example, nouns referring to “fear”, “fright” or “terror” were combined into the FEAR cluster. Similarly, the nouns meaning “sorrow” but also “sadness” or “grief” comprise the SORROW cluster. The principles organizing each cluster are described further in §3.2. In doing so, we did not rely solely on the English categories projected from the labels we used, but also on the profile of the corresponding emotion concepts in Australian languages, as reported in the literature (see also Ponsonnet, 2014). We additionally collected information on the range of senses covered by each noun, i.e. on the senses “colexified” by each of the 299 emotion nouns, which informs our discussion on semantic shifts and the semantic pathways leading to the emergence of emotion nouns, in §4.

### 3. Prevalent emotion categories

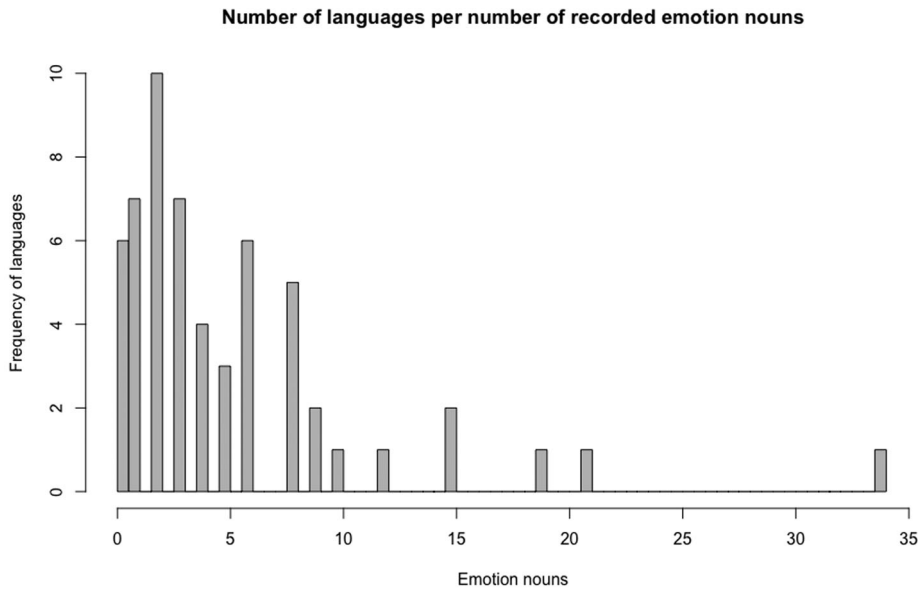
In this section, we discuss the size and semantic distribution of emotion noun inventories in our sample. This answers research question (a), as articulated in §1.3. We first present a quantitative overview of the results, confirming that Australian Indigenous languages usually do not rely heavily on the noun class for emotion denotation. Sections §3.2.1–§3.2.6 present the semantic clusters we identified in the data, and corresponding emotion categories.

#### 3.1 Quantitative distribution

Languages in our sample record an average of 5.2 emotion nouns: 299 nouns across 57 languages. As shown in Figure 2, the highest number in a language is 34, in Pintupi/Luritja. Kalaw Kawaw Ya comes in second, with 21 nouns, and Warlpiri follows with 19. More than half of the languages we examined have less than three. In six languages (approximately 10% of the language sample) emotion nouns are unattested in spite of substantial lexical documentation in the emotional domain: Jaminjung, MalakMalak, Mudburra, Pitjantjatjara/Yankunytjatjara, Wardaman and Yanyuwa.

Pama-Nyungan languages have a higher average number of emotion nouns in comparison to non-Pama-Nyungan languages.<sup>5</sup> Explanations for the higher prevalence of emotion nouns in Pama-Nyungan languages should probably be sought in grammatical features such as productive nominalization devices, but as pointed out in §1.4, this is

<sup>5</sup>A Mann-Whitney U test revealed this difference to be significant ( $W = 247, p = 0.029$ ). Pama-Nyungan:  $M = 6.56, SD = 7.00$ ; non-Pama-Nyungan languages:  $M = 3.0, SD = 2.74$ .



**Figure 2** Number of languages per number of recorded emotion nouns

beyond the scope of our study. The difference between languages with three word classes and those with two word classes (i.e. noun vs. nominal languages) proved not to be statistically significant.

### 3.2 Semantic clusters

The 299 emotion nouns we identified do not distribute evenly across the semantic space. Qualitative semantic analysis revealed that they cluster into groups of nouns that denote similar emotional experience, and that some of these groups are larger than others. Table 1 lists the labels for each of the 14 notable clusters, and their representation across the sample. The distribution of the clusters does not suggest any significant implicational scales, where the attestation of certain clusters would be conditioned by the attestation of some other (more frequent) clusters. Therefore, the differentiated prevalence highlighted in Table 1 does not reflect an order of historical development.

In line with Ponsonnet's (2014, pp. 18–21) observations for Dalabon, and Peile's (1997, p. 119) for Kukatja, we note that no cover term (hypernym) for emotion was reported in any of the sources we consulted. This is not exceptional: having no dedicated "superordinate term for emotional experiences" is not uncommon cross-linguistically (Ogarkova, 2013, p. 53).

In order to give a sense of lexically prevalent emotion categories, in the following subsections we describe the semantic profile of each of the six largest clusters we identified. For convenience, and because English is used as a metalanguage in most of the sources we considered, we have assigned them English labels such as ANGER, SHAME, etc. The semantic profiles of the clusters do not correspond directly to English lexical categories. For the sake of clarity, we chose labels that evoke the semantic profile they designate, but

**Table 1** Number of documented emotion nouns by cluster

	ANGER	FEELING	SHAME	LOVE	FEAR	SORROW	JEALOUSY	HAPPINESS	ANXIETY	HATRED	GREED	SURPRISE	CALMNESS	COURAGE	Other <sup>a</sup>
Languages	28	24	24	23	23	19	16	13	10	5	5	4	3	3	5
Nouns	46	39	29	50	37	30	19	16	12	6	5	4	3	3	8

Note: <sup>a</sup> The nouns grouped into semantic clusters include those relating to the concepts of “pride”, “hesitation”, “satisfaction from retribution”, “disappointment”, “relief” and “dissatisfaction”.

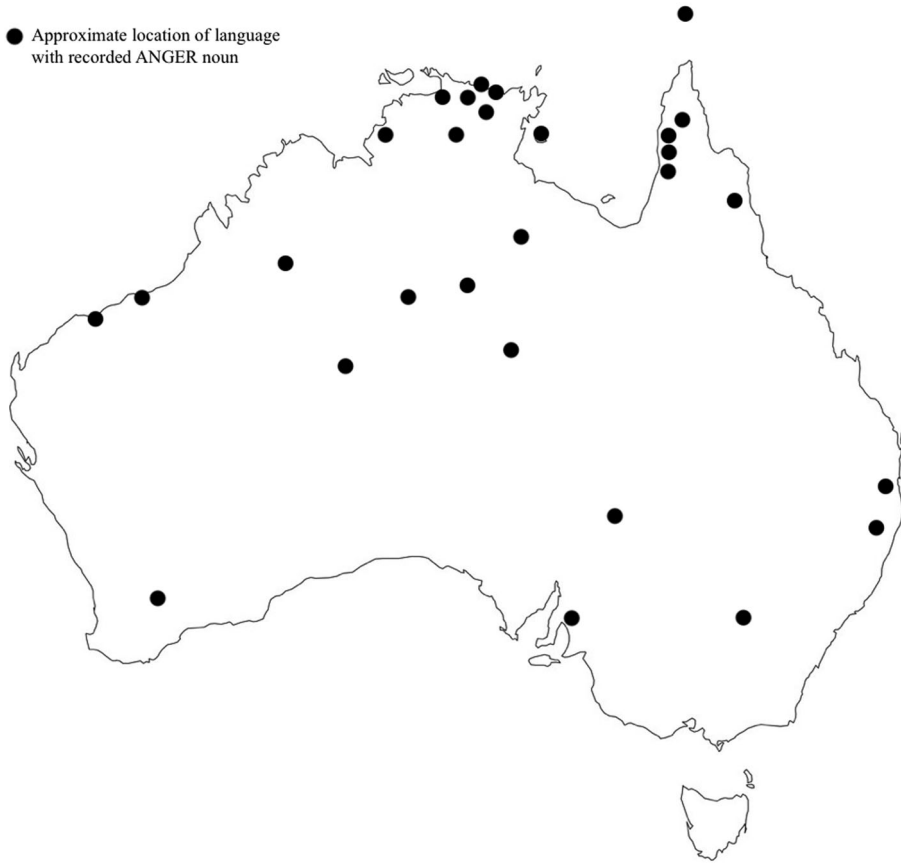
the categories themselves are a product of our qualitative examination of the data, based on the clusters observed in our sample, and are by no means inherently universal or primary semantic categories across Australian languages. Each subsection below starts with information on the size and geographic distribution of the cluster (including cognate sets where applicable), and is followed by a discussion of the semantic profile.

### 3.2.1 The ANGER cluster

The largest cluster numbers 46 nouns, occurring in 28 of the sample languages (or 49%, see Figure 3). These nouns denote emotional experience similar to anger and aggression (hereafter ANGER). We identified three cognate sets amongst the ANGER nouns in our data. Nine languages feature reflexes of the form *\*kuli* (n, nAdj)<sup>6</sup> “anger”, which has been reconstructed for proto-Pama-Nyungan (Alpher, 2004, pp. 435–436) – see Table 2. Alywarr and Kaytetye both use *aha* /aha/ for their anger nominal, and *baja* /baɟa/ is found in both Ngarluma and Warlpiri. The 33 other nouns in this cluster do not immediately appear to be historically connected. Most languages in the ANGER cluster (21 of 28) are found to have only one ANGER noun, while four languages (Anindilyawka, Njébbana, Yugambeh and Kaytetye) record two, Kalaw Kawaw Ya three, and Warlpiri four. Pintupi/Luritja is the unrivalled leader with 10, an unusual statistic for any language or emotion concept in the data.

Notwithstanding some variation, ANGER nouns mostly denote aggressive or dangerous anger, a colexification attested in other languages across the world (Rosaldo, 1980). Terms signifying aggression and danger (e.g. “cheekiness” or “hostile”) are used directly in the translations of 11 out of 46 ANGER nouns. Further aggressive-type anger meanings are also evident in illustrative examples, such as in (1) and (2) below. Pre-empting damaging stereotypes, it is imperative to note that this *linguistic* association between anger, aggression and violence in nouns does not reflect cultural acceptance of violent behaviours. Culturally, hostile or uncontrollable anger – the aggressive type well-represented in nouns – can be negatively evaluated (Ponsonnet, 2014, p. 326). ANGER meanings that do not relate to aggressive behaviour (e.g. “sullen”, “sulkiness”, “agitation”, “contained anger”) are represented in the noun data to a much lesser extent but are certainly not absent from Australian language lexicons. Various Indigenous languages’ emotion terms differentiate between open, aggressive hostility and brooding anger (Harkins, 2001, p. 204; Myers, 1988, p. 600; Ponsonnet, 2014, p. 195).

<sup>6</sup>Abbreviations: adj = adjective, adv = adverb, cv = coverb, n = noun, nAdj = adjectival nominal, nom = nominal, POS = part of speech, pv = preverb, v = verb, v.i. = intransitive verb, v.t. = transitive verb.



**Figure 3** Map of languages with recorded ANGER nouns

- (1) Alyawarr *aha* nom. “anger”  
*Nga apek aha ilkwakert nga apek ahelengkwarl aneyel. Ayengan mwerrarl aneyel ahewenyarl.*  
 “Perhaps you have a lot of anger you’re aggressive.” “I’m alright I’m not angry.” (Green et al., 2019, p. 26)
- (2) Kaytetye *amperne*  
 n. “hungry, starving”  
 v.i. 1. “be very hungry, starving”; 2. “get angry, be furious”<sup>7</sup>  
*Ampernarengele atyenge alarrenhe mpele artweyele apeke no chance etnyenhe ampernarengele.*  
 “He was furious and hit me. I had no chance, he was that angry.” (Turpin & Ross, 2012, p. 107)

The collocation between anger and aggressive behaviour also occurs in Aboriginal English and Kriol. For example, Aboriginal English *cheeky* contains an idea of aggressive behaviour (Malcolm & Sharifian, 2007, p. 390) as well as “the sense of ‘dangerous’, ‘violent’, or ‘painful’, and, particularly in the context of plants and animals, ‘poisonous’” (Butcher, 2008, p. 638). This sense of *cheeky* was in many cases employed in translation of ANGER nouns in our data. Kriol *tjiki* (<Eng. “cheeky”) likewise combines a sense of “angry”, “aggressive” and “dangerous” (Burbank, 1994, p. 57; Ponsonnet, 2018, p. 107).

<sup>7</sup>Included in data based on Turpin’s (2002, p. 283) interlinear gloss, where *amperne* is marked as “anger.ACC” (ACC = accusative).

**Table 2** Reflexes of proto-Pama-Nyungan \**kuli* in the data

Language	Lexeme	POS	Gloss / definition	Source
Kuku-Yalanji	<i>kuli</i>	noun	1. anger; 2. poison; 3. trouble	(Hershberger & Hershberger, 1982, p. 91)
Kuuk Thaayorre	<i>ngeengk- kul</i>	noun	wrath, rage (“anger, lit. belly-lap” in Gaby, 2008)	(Hall & Foote, 1992)
Walmajarri	<i>kuli</i>	nom	anger; belligerence/belligerent; fight, physical struggle; war	(Richards & Hudson, 1990, p. 94)
Warlpiri	<i>kulu / kuli</i>	nom	anger, fight, trouble, aggression, argument, altercation, disagreement, danger, harm, hostility. [state or activity which may result in harm or unpleasantness]	(Laughren et al., 2022, pp. 265, 268)
Wik Mungkan	<i>kul</i>	noun, adj	1. (n) grass type, 2. (n) handle (e.g. of bag), 3. (n, adj) angry, wild	(Kilham et al., 2011)
Wik- Ngathan	<i>kul</i>	noun, adv	anger; angrily	(Sutton, 1995, p. 27)
Wiradjuri <sup>a</sup>	<i>gulaa</i>	noun	anger; <i>coolah</i> grass	(Grant & Rudder, 2005, p. 262)
Yir-Yoront	<i>(ngerr-)kol</i>	noun	anger, rage, angry, wild 1. anger, 2. soldiers, men on a revenge expedition, 3. very many, big mobs	(Alpher, 1991, p. 183) (Alpher, 2006, p. 5)
Yugambah	<i>gulah</i>	noun	anger	(Sharpe, 2020, p. 106)

Note: <sup>a</sup> Wiradjuri *gulaa* is not incorporated in the proof for proto-Pama-Nyungan \**kuli*; however, it is included here given its phonemic similarity (/gula:/) to Yugambah *gulah* (/gula:/), which the author notes is “prob. from early pidgin known from Sydney area” (Sharpe, 2020, p. 106). Also to note is that Kriol *gula* means “trouble, fight, argument, aggression”, etymologically from the Sydney area as well (Ponsonnet, 2018, p. 108).

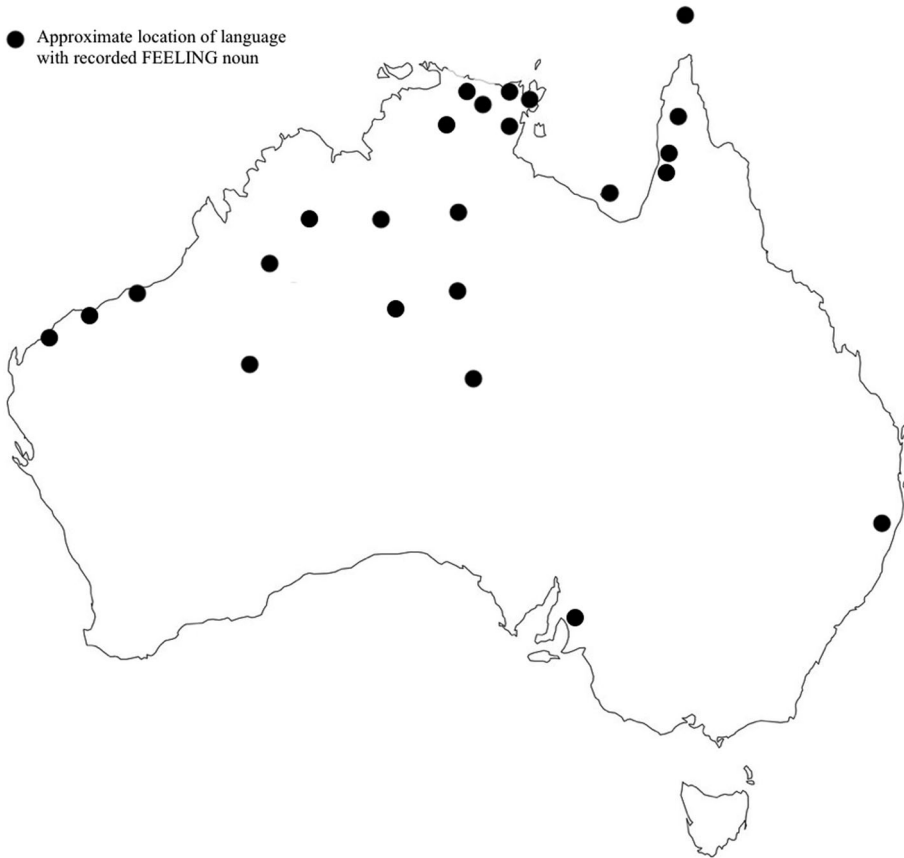
### 3.2.2 The FEELING cluster

The next largest cluster, called FEELING for lack of a more precise label, groups together 39 nouns across 24 languages, or 42% of the sample. We use the label FEELING because this is the most common translation in our sources; however, the label should not be viewed as indicating the common English understanding of *feeling* (including its possible use as a hypernym – see §3.1). These nouns are mostly found in languages in the northern half of the continent, generally in line with the density of language documentation – see Figure 4.

The semantics of this cluster revolves around a concept of “life energy”, such as that discussed by Ponsonnet (2014, pp. 206–209; 2016) for Dalabon and by Kofod and Crane (2020, pp. 219–222) for Gija. English does not clearly lexicalize this concept, but some other non-Australian languages do (e.g. Maya Yucatec *óol* “will, desire, energy” or “life energy” (Leguen 2017, as cited in Ponsonnet, 2016, p. 235)). As illustrated by the entries in Table 3, FEELING nouns denote inclination, motivation, enthusiasm, life energy or spirit, and even soul. As Ponsonnet (2016, p. 235) put it, they encapsulate “a generic concept in the sense that it refers to someone’s ‘bare emotional state’”. These nouns may also capture a sense of basic emotional drive, inner life force or spirit, with desire, inclination or impulse (e.g. “urge”, “inclination”, “will”, “desire”, “want”, “wanting”, “keenness”, “enthusiasm”, “pep”, “attachment”, “love”<sup>8</sup>).

FEELING nouns straddle the emotional, physical, intellectual and spiritual domain to various degrees. Concepts related to these domains are part and parcel of many descriptions of emotions in several Indigenous languages (Brown et al., 2012; Peile, 1997; Wynne-Jones et al., 2016). This can include intuitive knowledge: four nouns in the FEELING cluster

<sup>8</sup>Although contrary to nouns in the LOVE cluster (§3.1.4), they are not specialized for romantic love, sexual desire or outright wanting.



**Figure 4** Map of languages with recorded FEELING nouns

are translated as “premonition” and refer to an intuitive hunch akin to “gut feeling” (3).<sup>9</sup> At the same time, Kriol translations of Dalabon *yolh-no* “pep, feelings” illustrate a relatively intellectual dimension: apart from *filing* (<Eng. “feeling”) and *wil* (<Eng. “will”), they include *aidiya* (<Eng. “idea”) and *main* (<Eng. “mind”) (Ponsonnet, 2009; 2014, p. 207; 2020, p. 70).

- (3) Gurindji, *kawurru*, nom.  
 “1. lower chest”  
 “2. seat of feelings, gut feeling, ‘heart creak’ in Kriol. This is the feeling you get when your child, husband or wife approaches”  
 “3. life force, soul”. (Meakins et al., 2013, p. 155)

### 3.2.3 The SHAME cluster

The cluster of 29 nouns denoting experiences related to shame (hereafter labelled SHAME) is instantiated in 24 languages. This is equivalent to the FEELING cluster, but for a smaller

<sup>9</sup>Some premonition nouns have not been included in the FEELING category because their sense relates more closely to anxiety, foreboding or apprehension and thus classed under a separate category, ANXIETY.

**Table 3** Examples of lexical entries for FEELING nouns

Language	Lexeme	POS	Gloss / definition	Source
Arrernte	<i>utnenge</i>	nom	<ol style="list-style-type: none"> <li>1. life, being, soul, spirit (of living being) (It is the source of vitality, well-being and sense of purpose, and can be taken away by magic, getting a fright or some bad or tragic event.)</li> <li>2. liveliness, vitality, life</li> <li>3. the spirit of a place or a dreaming;</li> <li>4. the solid stuff that living things are made of; flesh, wood.</li> </ol>	(Henderson & Dobson, 1994, p. 617)
Burarra	<i>ganyjarr</i>	noun	motivation, inner urge or calling; assignment; authority; power	(Glasgow & Glasgow, 2011)
Jawoyn	<i>yilk</i>	noun	guts, spirit, gumption	(Merlan & Jacq, 2005, p. 16)
Kurna	<i>muiyu</i>	noun	feelings, inclination, attachment, love (“fain”)	(Amery, 2020, p. 275)
Nunggubuyu	<i>ramarr</i>	noun	thought, feeling; emotion, desire	(Heath, 1982, p. 156; Hore, 1994)
Warlpiri	<i>pirlirra</i>	nom	<ol style="list-style-type: none"> <li>1. spirit, soul, life-force</li> <li>2. mind, feeling, disposition, attitude, belief</li> <li>3. (extension) image, portrait, picture, photograph, sound recording [reproduction or copy of the sound and/or image of some entity]</li> </ol>	(Laughren et al., 2022, pp. 709–710)
Wik Mungkan	<i>Ngangk</i> <sup>a</sup>	noun	<ol style="list-style-type: none"> <li>1. heart and stomach area</li> <li>2. soul</li> </ol>	(Kilham et al., 2011)
Yir-Yoront	<i>morr-thaw</i>	noun	<ol style="list-style-type: none"> <li>1. body, outward manifestation of bodily state</li> <li>2. mood, state of health, condition of the body or emotions</li> </ol>	(Alpher, 1991, pp. 517–518)

Note: <sup>a</sup> Kilham et al. (2011) note that “*ngangk* is used in many compounds and phrases ... where the emotions are deeply involved”.

number of nouns (29 versus 39). As can be seen in Figure 5, no SHAME noun is attested in the five Cape York languages of our sample, nor in the five Daly River languages. The SHAME cluster includes two sets of cognates, found in an array of languages known from the literature to share similar conceptions of “shame”, as discussed below (cf. Myers, 1979 on Pintupi; Peile, 1997 on Kukatja; Turpin, 2002 on Kaytetye). These cognate roots, listed in Table 4, are spread over central Australia and the southwest, Pilbara and Kimberley regions.

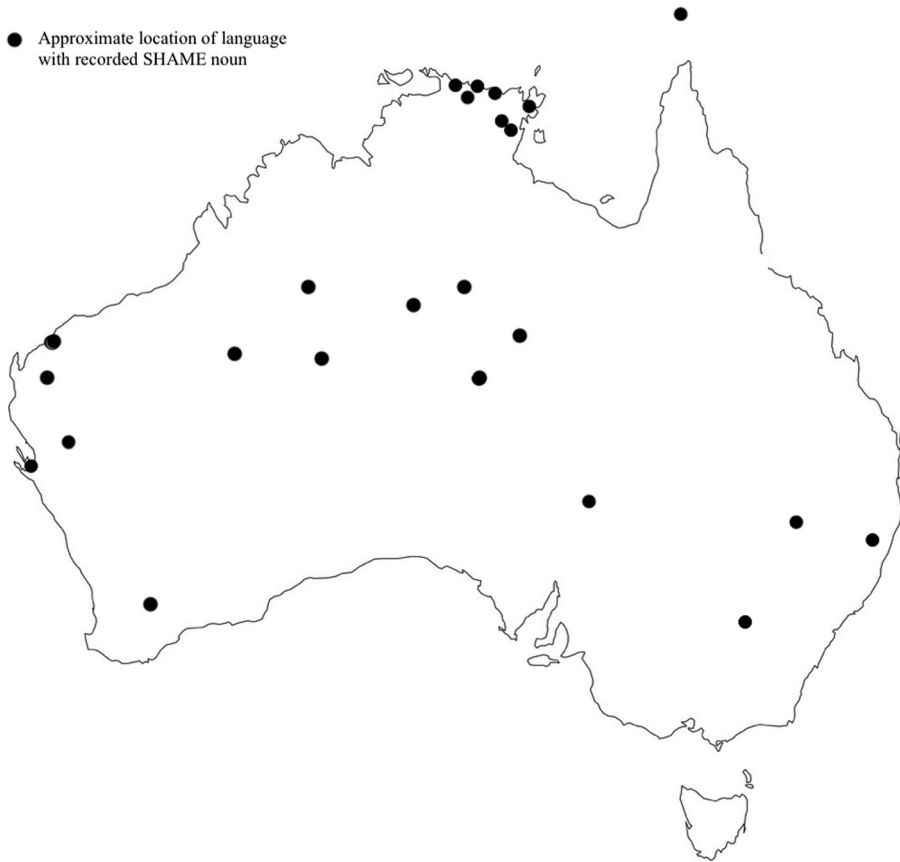
The glosses and definitions of nouns in this cluster indicate that they typically colexify “shame” and “shyness” (19 out of 29 nouns), followed by “ashamed” (12 out of 29) and “embarrassment” (11 out of 29). These findings align with Harkins’ (1990) observations in central Australia, and descriptions across Australia:

One of the strongest Aboriginal concepts is the feeling of shame which is felt when people are singled out in front of a group, whether it be for praise or for rebuke. This concept of shame has no simple equivalent in non-Aboriginal society, but it is like a mixture of embarrassment and fear. (Eades, 2013, p. 103)

It also more generally points to Levy’s (1983, p. 131) observation that shame and embarrassment (and shyness, cf. Russell, 1991) tend to form a “lexically unified cluster in most parts of the non-Western world”.

The use of the Aboriginal English *shame* lexeme to translate nouns in traditional Australian languages has undoubtedly played a role in the consistency and coherency of their glosses. Its sense is more closely aligned with – and/or influenced by – traditional Aboriginal languages (Harkins, 1990, 1996; Malcolm, 2018; Sharifian, 2005), where it can be related to “spotlighting” or being singled out (see also Ponsonnet, 2020, pp. 50–53).





**Figure 5** Map of languages with recorded SHAME nouns

In some definitions, authors have explicitly noted the comparability of Aboriginal English *shame* and traditional semantics. In others, it can occasionally be unclear whether the gloss “shame” is intended as Standard or Aboriginal English.

There are slight discrepancies across the continent as to whether “guilt” is entailed in the meaning of SHAME nouns (see Peile, 1997, p. 122 on Kukatja for example). However, guilt is only used in the gloss for one SHAME noun in the data (Yolngu Matha *gora* “shame, ashamed, embarrassment, shy, guilt”), and this persistent absence in lexical entries and examples is in line with the Aboriginal English *shame* sense. One might expect to see significant overlap between the FEAR and SHAME categories, given Eades’ (2013, p. 103) definition of shame above (i.e. shame involving a fear of others). Gaby and Singer (2014, p. 308) also mention that a “common pattern found in Australian languages is to use a single term for both ‘fear’ and ‘shame’”, and a colexification with “fear” is attested in Australian Indigenous body-based emotion expressions (Hiatt, 1978; Peile, 1997, p. 46; Ponsonnet & Laginha, 2020). However, we only found the glosses “fear” and “shame” assigned to the same noun in one language, Njébbana (*warayéma* “shame, fear”; O’Keeffe et al., 2020, p. 94).<sup>10</sup>

<sup>10</sup>This noun has been counted under both the SHAME and FEAR clusters.

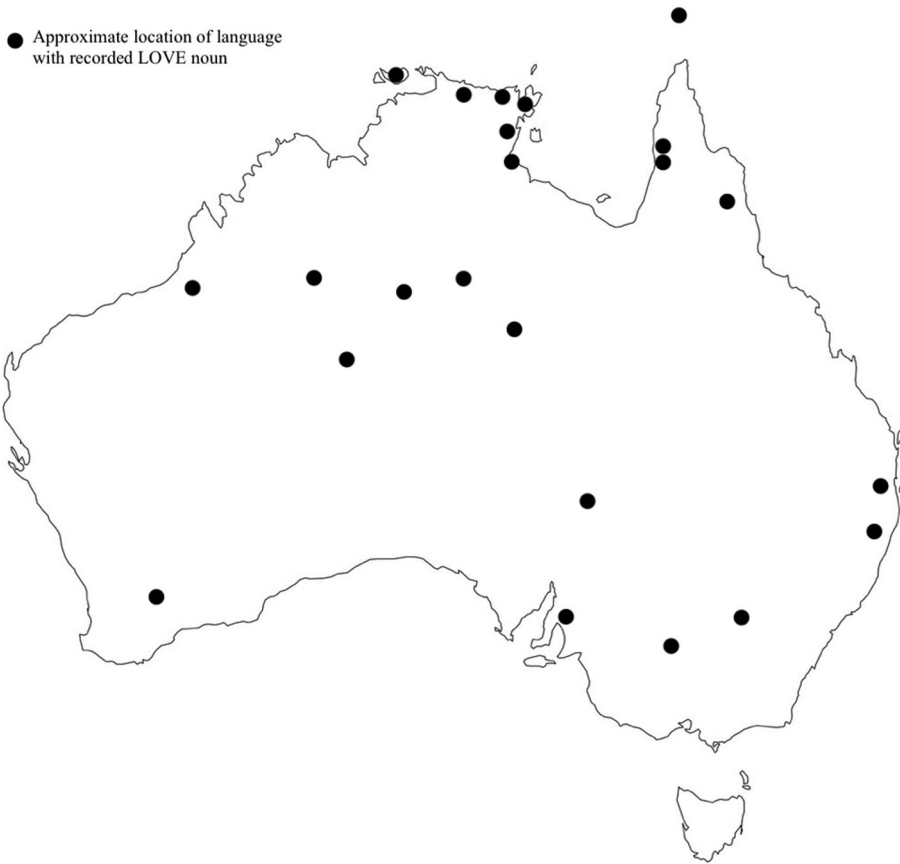
**Table 4** Shared roots for SHAME nouns

Language	Lexeme	POS	Gloss / definition	Source
Alyawarr	<i>nyerr</i>	nom	1. respect, reserve, reticence 2. behaviour that is shameful or embarrassing 3. shy	(Green et al., 2019, pp. 295–296)
Arrente	<i>nyerre</i>	nom	Synonym with <i>apure</i> (1. the feeling someone gets about doing something wrong, stupid or inappropriate and what other people think or say about that; shyness, embarrassment, shame, not sure of the right way to behave. 2. the way people behave when they feel [apure]. This usually involves not looking at the people who make them feel this way, not speaking to them directly or perhaps at all, or moving away from them. 3. behaving [apure] when it is appropriate to do this; knowing what kind of behaviour is wrong, stupid or inappropriate)	(Henderson & Dobson, 1994, pp. 189, 516)
Jiwarli	<i>kurnda</i>	nom	a. shame b. politeness	(Austin, 1992, p. 16)
Kaytetye	<i>nyerre</i>	nom	1. ashamed, embarrassed, not feeling confident 2. shameful behaviour, someone who has broken the law, acting shamefully, acting disgracefully 3. proper behaviour, such as being quiet and reserved when certain kin are around 4. shy, reserved, timid, reticent 5. tame	(Turpin & Ross, 2012, p. 523)
Kukatja	<i>kurnta</i>	nom	shame, respect, embarrassment, coyness, shyness	(Peile & Clynes, n.d.)
Martuthunira	<i>kurnta</i>	nom, verb	(nom) shame; respect language style; (v) be ashamed, to show respect; to speak respectfully	(Dench, 1994, p. 334)
Martu Wangka	<i>kurnta</i>	nom	shy; shame; ashamed	(Marsh, 1992, p. 137)
Nyungar	<i>kurnda</i>	nom	shame	(Dench, n.d.)
Pintupi / Luritja	<i>kun<u>ta</u></i>	nom	shyness; respectful; reticence; reluctance to be involved; has connotation of fearing to make the wrong move which may result in scolding or harm	(Hansen & Hansen, 1992, p. 35)
Warlpiri	<i>kurnta</i>	nom, preverb	1. shame, shameful, shyness, embarrassment, reserve, timidity, reticence 2. satisfied (having dealt out retribution), vindicated [feeling of retribution at having dealt out punishment to someone that one hates, or who has done something that harmed or displeased]	(Laughren et al., 2022, p. 294)

### 3.2.4 The LOVE cluster

Nouns in the next cluster, which we label LOVE, are attested in 23 languages (40% of the sample). With 50 nouns in total, this is the greatest cluster in size, albeit also broadest in semantic scope. LOVE nouns are not reported in sample languages of the Pilbara region nor the Daly River region (see Figure 6). Pama-Nyungan languages are better represented in this cluster than non-Pama-Nyungan languages: half versus less than one-quarter of languages recording a LOVE noun respectively.

The nouns we grouped into the LOVE cluster present a less coherent semantic profile than those in the five other clusters described in this section, in terms of recurring glosses, senses and associations (and perhaps the furthest removed from its English label). Our LOVE category includes emotions such as romantic love, general desire, volition, affection, liking, sexual desire and wanting, as illustrated in (4)–(6). These emotions share a family resemblance and form a web of overlapping colexifications. This is not entirely surprising given previous documentation, such as in Yankunyatjara with the nominal



**Figure 6** Map of languages with recorded LOVE nouns

*mukulya* “fond of, keen on”, which “may also be used as an abstract noun roughly equivalent to English ‘love’” (Goddard, 1990, p. 287). Such a semantic pattern is again observed in the related verb *mukuringanyi*, which can cover the notions of “desire/fancy”, “like” and “care for, love” (Goddard, 1990, p. 260). Our criterion for including a noun in the LOVE cluster was that it colexifies at least some of the emotion senses mentioned – although few nouns colexify all of them.

- (4) Wiradjuri, *ngurrbul*, n.  
“love, amorous, friendship” (Grant & Rudder, 2005, p. 309)
- (5) Kalaw Kawaw Ya, *mam(a)*, n.  
“love, affection, caring, passion” (Ober & Kennedy, 2006)
- (6) Kuku-Yalanji, *kuru*, n.
  1. “woman’s affection/love/lust to a man”
  2. “grub found in dry grass tree” (Hershberger & Hershberger, 1982, p. 98)

The lexical data also show that nouns denoting “lust” often entail a negative evaluation of the emotion. Love-related concepts (especially sexual desire) can carry generally negative connotations in Australian Indigenous societies, by contrast with those that indicate

affection, which is highly valued (Burbank, 1995; Ponsonnet, 2014, p. 185). Across the world, it is not uncommon for “Sexual love [to be] assimilated to concepts that are close to greed or desire” (Russell, 1991, p. 431). In our sample, six nouns across six languages refer explicitly to lust, sexual desire or arousal. These nouns, plus others referring to sexual behaviour less directly, exhibit negative connotations, for example via colexifications with “greed”:

- (7) Gumbaynggirr, *bilirr*  
 n. “1. dysentery; 2. greed, gluttony, lust, excessive desire or hunger”  
 adj. “greedy, gluttonous, lustful” (Morelli, 2015, p. 21)

### 3.2.5 The FEAR cluster

The cluster labelled FEAR numbers 37 nouns, across 23 languages. We identified several sets of potential cognates distributed across the central Australia, Pilbara and Kimberley regions, listed in Table 5. Over half of Pama-Nyungan languages (20 of 36) feature a FEAR noun, whereas only three of 21 non-Pama-Nyungan languages (14%) do (Figure 7).<sup>11</sup>

Nouns in the FEAR cluster relate to emotions with an implication of fright or sudden, reactive fear. Apart from “fear”, glosses like “fright”, “shock”, “terror” or “alarm” are often involved. Immediate fear is usually lexicalized distinctly from extended fear, i.e. uncomfortable premonition, apprehension or anxiety (which form a separate, albeit smaller cluster – see Table 1 in §3.2; also see Musharbash (2010b, 2013) regarding fear and anxiety in Warlpiri). Our source for Nyangumarta, for instance, makes such a contrast explicit:

- (8) Nyangumarta, *ralpurr*, n.  
 “sudden fear. For example when something unexpectedly brushes past you in the night.” (Geytenbeek, n.d.)
- (9) Nyangumarta, *jumparna*, v.t.  
 “he sensed it, he knew it was coming. This verb does not have the component of fear that is in *ralpurr*.” (Geytenbeek, n.d.)

### 3.2.6 The SORROW cluster

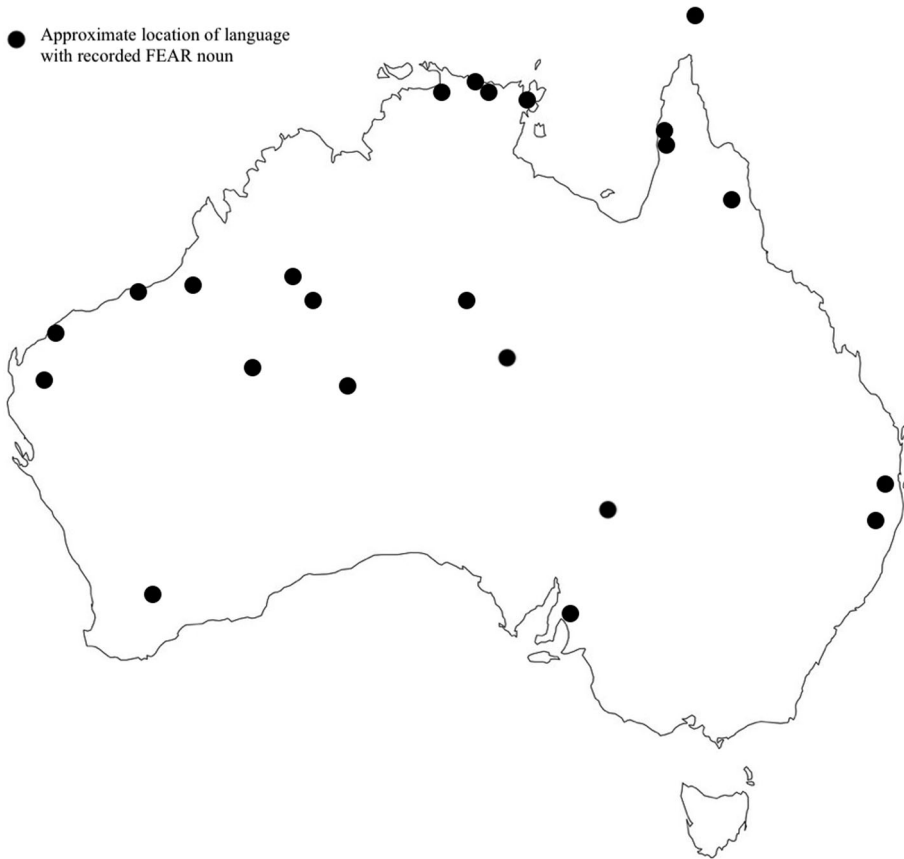
A sixth cluster, related to sorrow and sadness (hereafter referred to under the label SORROW), has representatives across 19 languages (one-third of the sample), and numbers 30 nouns. SORROW nouns are most prevalent in the region of Arnhem Land (see Figure 8). There are two tightly linked semantic patterns in this cluster, one describing “other-oriented” sorrow, emotional pain having to do with attachment to others; and the other “self-oriented” sadness. These trends join into the same cluster because many definitions and examples indicate that both types of emotions result from a separation or deprivation, whether from the loss of kin inducing grief, or isolation from kin or country that invokes pining, worrying, loneliness and/or homesickness.

Within the first trend, we find senses around “compassion” and “care”, focusing on suffering on behalf of others, or because others are suffering, i.e. interpersonal, other-

<sup>11</sup>Gaagudju, Kunbarlang and Njébbana.

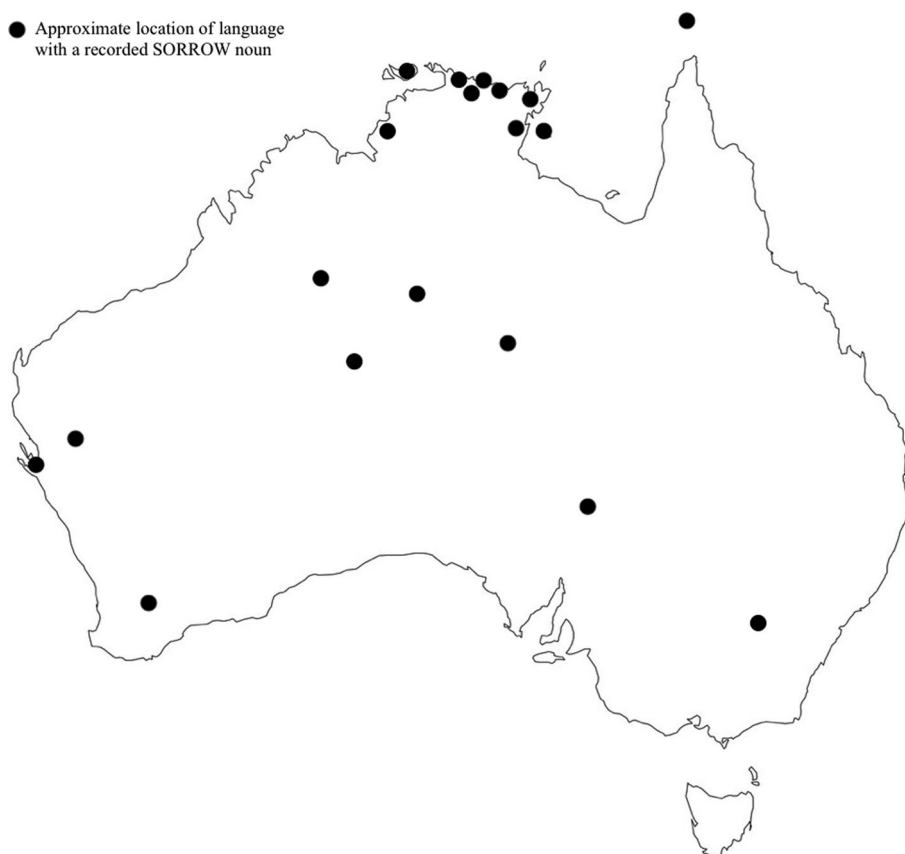
**Table 5** Shared roots for FEAR nouns

Language	Lexeme	POS	Gloss / definition	Source
Alyawarr	<i>ater</i>	nom	fright, fear	(Green et al., 2019, p. 158)
Kaytetye	<i>atere</i>	nom	frightened, afraid, scared; wild, feral animal; fear	(Turpin, 2002; Turpin & Ross, 2012, p. 233)
Kukatja	<i>karrata</i>	nom	fear	(Peile & Clynes, n.d.)
Kukatja	<i>ngurlu</i>	nom	fear	(Peile & Clynes, n.d.)
Martu	<i>karrata</i>	nom	fearful; fright; shock	(Marsh, 1992, p. 106)
Wangka Martu	<i>ngurlu</i>	nom	fear, fright; sacred (of object or ceremony); taboo; the sacred area	(Marsh, 1992, p. 223)
Nyangumarta	<i>karrata</i>	noun	fear	(Geytenbeek, n.d.)
Pintupi/Luritja	<i>ngulu</i>	nom	fear, afraid	(Hansen & Hansen, 1992, p. 85)



**Figure 7** Map of languages with a recorded FEAR noun

oriented feelings (see, e.g. Ponsonnet, 2014, p. 187; 2022, p. 165). Seven (of 30) nouns were glossed with “pity”, six with “grief”, three with “compassion” and three with “care”. Five nouns were glossed with *sorry*, which in its Aboriginal English sense can denote “sorrowful, mourning, and empathy/worry/care for other people” (Sharifian, 2011, p. 70). As shown in Table 6 and illustrated for Mawng in (10), SORROW nouns in our sample express similar concepts and this cluster of senses is well-documented in



**Figure 8** Map of languages with a recorded SORROW noun

**Table 6** Examples of lexical entries for SORROW nouns

Language	Lexeme	POS	Gloss / definition	Source
Nungubuyu	<i>wargayuny</i>	noun	pity, feeling sorry (not common) <sup>a</sup>	(Heath, 1982, p. 224)
Mawng	<i>wurk</i>	noun, coverb	(n) sorrow, sadness; (cv) 1. (with <i>kingawun</i> ) be sad, sorrowful, 2. (with <i>kinnyaka</i> ) swallow, eat, 3. (with <i>kinnyatpi</i> ) have compassion, feel sorry for	(Singer et al., 2021, p. 224)
Wajarri	<i>warritharra</i>	nom	sorrow, the feeling of pining for someone or something; a longing feeling towards someone or something; pangs of unhappiness	(Mackman, 2012, p. 143)
Wiradjuri	<i>ngarrarr</i>	noun	sorry, sorrow, worry, trouble	(Grant & Rudder, 2005, p. 302)

Note: <sup>a</sup> Abstract noun derivative of verb *wargayu-* “to pity (someone), to feel sorry for” (Heath, 1982, p. 224).

the literature for Australian languages (see Myers, 1991, p. 113 on Pintupi; Peile, 1997, p. 128 on Kukatja; Tamisari, 2014 on Yolngu Matha; Turpin, 2002, p. 291 on Kaytetye).

- (10) Mawng, *wurk*  
 n. “sorrow, sadness”  
 cv. 1. (with *kingawun*) “be sad, sorrowful”, 2. (with *kinnyaka*) “swallow, eat”, 3. (with *kinnyatpi*) “have compassion, feel sorry for”  
*Wurk kapalkpa ngarruru la kawararren nuyu ja nakapa ja arrarrkpi ja imajungan.*  
 “Sorrow comes to us as they cry for the dead man.” (Singer et al., 2021, p. 224)

The second trend in the SORROW cluster relates to self-pitying sadness. This type of emotional meaning is attested in the data to a much lesser extent, either with glosses of “lonely”/“loneliness”, “homesickness”, “pining”, “worry”, or as evident in illustrative examples. For instance, in (11) for Alywarr *alpwely*, it is made clear that the sorrow sense is self-pitying, which can be compared with the type of emotion in Diyari *walkarra* (12).

- (11) Alywarr, *alpwely*, nom.  
 “1. sad, sadness, 2. weak”  
*Arelh yanhan alpwely aneyel ampeweny.*  
 “That woman there is sad because she has no kids” (Green et al., 2019, p. 59)
- (12) Diyari, *walkarra*, n.  
 “sadness”  
*nhani wilha walkarra-li ngana-yi kupa-nhi*  
 “The woman is sad for the child” (Austin, 2017, p. 5)

### 3.3 Summary

In this section, answering our first research question “Which emotion categories are frequently expressed by Australian emotion nouns?”, we identified a number of categories which we labelled ANGER, FEELING, SHAME, LOVE, FEAR and SORROW (as well as several clusters recorded across fewer languages: JEALOUSY, HAPPINESS, ANXIETY, HATRED, GREED, SURPRISE, CALM and COURAGE – see Table 1). By delving into these clusters, we also presented recurring meanings, showing that certain semantic associations are cross-linguistically more robust than others. Naturally, the shared inheritance of colexification embedded in individual roots may contribute to explain some of these regularities: as we saw, the ANGER and SHAME clusters feature sets of cognates, where semantic resemblances reflect a shared etymon. However, this phenomenon affects a small portion of the data. The bulk of the observed semantic regularities are observed across seemingly unrelated roots, and therefore it is difficult to claim they result from linguistic inheritance. Instead, our data may reflect a persistent areal semantic structure that is reinforced by a process of “relexification through semantic realignment” (François, 2022, p. 111), fostered by widespread multilingualism and broader cultural contact. The respective role or weight of linguistic and cultural influences in these dynamics is a question for future research.

## 4. Patterns of colexification

Now that we know which emotion categories are prevalent in Australian emotion nouns, we turn to research question (b): *how* do these nouns emerge, or under which linguistic conditions? That is, can our data inform us on plausible etymological sources for the emotional meanings of the clusters we have identified? To shed light upon this question, we considered the colexifications of emotion nouns captured in our lexicographic dataset.<sup>12</sup> As pointed out by Evans and Wilkins (2000), when the meaning of a linguistic

<sup>12</sup>While most of our diachronic insights here come from the colexification patterns in our data, we also took into account any explicit discussion of a noun’s etymology contained in our sources (although such discussions were rare).

form changes from A to B, there is normally a period of time during which the form retains both meanings, thus colexifying A and B for a while (see also Evans, 1992, p. 447; François, 2008; Lichtenberk, 1991; Traugott & Dasher, 2002, p. 11). Reflecting this process, the recurrent colexifications observed in our data are potentially indicative of the diachronic origin of emotion words, and therefore inform us about the semantic pathways leading to their emergence.<sup>13</sup>

We identified direct colexifications between an emotional and a non-emotional sense in approximately half of the 299 nouns in our sample. Tables 7–12 report these colexified senses for the six largest noun clusters, i.e. those abbreviated as ANGER, FEELING, SHAME, LOVE, FEAR and SORROW, presented in §3.2.1–3.2.6. Tables 7–12 only list straight colexifications, as opposed to loose colexifications involving derivation (see François, 2008, pp. 171–172). Many colexified meanings are joint attributions of the exact same lexical noun, as seen in Yuwaalayaay *buul* (n.) “1. jealousy” with “2. tree knot. A knot or lump in wood or a stick” (Ash et al., 2003, p. 50). Another portion of the data involves heterosemies (which we may want to call “heterolexification”), i.e. colexifications across word classes. These are mostly with adjectives or verbs homophonous with an emotion noun, such as Yugambeh *ngidjahng* (n., adj.) “brave, daring, courage” (Sharpe, 2020, p. 161).

Colexifications do not in themselves inform us on the direction of semantic shift. Knowing that a word colexifies A and B does not tell us whether A is the older sense from which B developed, or the opposite. For example, from the fact that the meanings “nerves, sinews” and “feelings” are colexified in the Gija noun *nganyjoom* (Kofod & Crane, 2020, p. 222) we cannot – without further consideration – be certain that the sense “feelings” derived from “nerves, sinews”. However, one direction is often more likely than the other – in this case, extension from concrete body part to abstract emotion (Kofod & Crane, 2020; Kövecses, 2000; Ponsonnet, 2014, p. 183). For several of the major clusters, the lists and proportions of colexified meanings in Tables 7–12 are suggestive of historical developments, especially if we take into account the universal tendency of natural human language to develop more abstract meanings from more concrete ones over time.

The comparison of colexifications and likely etymologies across these clusters suggest two notable pathways of emergence for emotion nouns: associations with social behaviours; and body-part associations. These pathways match previous observations in other parts of the emotion lexicon (e.g. Ponsonnet, 2014; Ponsonnet & Laginha, 2020). We first discuss the possible conditions of emergence for behavioural associations in §4.1, and then for body-part associations in §4.2.

#### 4.1 Behaviours and social events

A preponderant colexification of emotion nouns in our data is with behaviours and resulting social events. This is particularly notable in the ANGER cluster, where approximately one-third of the nouns involve a colexification with a sense similar to “trouble”, “fight” or “danger” (some nouns illustrate several colexifications, see Table 7). It is likely that these senses constituted the sources of emotional meanings of ANGER nouns, based on

<sup>13</sup>See also “patterns of lexification” and the entailed concept of “dislexification” outlined by François (2022, p. 92).



**Table 7** Senses colexified in ANGER nouns ( $n = 46$ )

Approximate sense	Frequency across nouns
Fight, fight with, fighting	8
Argument	7
"Cheekiness", belligerence	7
Trouble, conflict	7
Wild, wildness	4
Jealous, jealousy	3
Mean, meanness	3
Disagreement, danger	2
Disobedient	2
Harmful, hurt	2
Madness	2
Beast	1
Be hungry, starving	1
Coolah grass	1
Dangerous fish	1
Grass type; handle (e.g. of bag)	1
Opponent	1
Passion	1
Poison	1
Skinny	1
Ugliness	1
Very hot, fierce (of sun)	1
War	1

**Table 8** Senses colexified in FEELING nouns ( $n = 39$ )

Approximate sense	Frequency across nouns
Belly, stomach	4
Seat of emotions, of feelings	4
Authority, power	3
Heart	3
Wanting, desire	3
Belief, attitude	2
Chest, lower chest	2
Moderately, sort of (in spirit)	2
Arch of foot	1
Attachment, fain	1
Belly of coolamon	1
Body	1
Breath	1
Cockatiel	1
Down, underneath, underside, bottom	1
Guts	1
Inside (of plane), hold (of boat); bulge (in a fish trap)	1
Light (colour)	1
Middle (of body, as opposed to left and right)	1
Nerves	1
So that, in order to, then	1
Sorrow, sadness	1
Urine, urination	1
The solid stuff that living things are made of, flesh, wood	1
The spirit of a place or a dreaming	1
Thought	1

a metonymy of BEHAVIOUR FOR UNDERLYING EMOTION (or EFFECT FOR CAUSE). Ngan'gi *ki* (13) is a prime example of the fight–anger association, but see also the illustrative examples contained in (1) and (2) above (§3.2.1). Alpher (2006) similarly notes a geographically vast but semantically similar metonymy occurring in both Cape York (cognates) and central

**Table 9** Senses colexified in SHAME nouns ( $n = 29$ )

Approximate sense	Frequency across nouns
Shy, shyness	10
Respect, respectful	4
Reserve, reticence	4
Appropriate, proper behaviour	3
Tame, timid, timidity	3
Shameful	1
Shameful behaviour	1
Polite, politeness	1
Shield, cover	1
Stung, dug into, ground down	1
Respect language style, speak respectfully, show respect	1
Parents-in-law, polite way of referring to one's spouse's father and mother	1
Fear	1
Guilt	1

**Table 10** Senses colexified in LOVE nouns ( $n = 50$ )

Approximate sense	Frequency across nouns
Throat, Adam's apple	5
Romance, flirtation	3
Friendship	2
Lover, beloved	2
Sex	2
Blood	1
Clitoris	1
Feelings, inclination	1
Generous, someone who looks after people	1
Greed, greedy	1
Grub found in dry grass tree	1
Heart	1
Hope	1
Incest, adultery, improper intercourse, wicked	1
Joy	1
Mating behaviour (of people and animals)	1
Request(s)	1
Promiscuity	1
Urine, urination	1

**Table 11** Senses colexified in FEAR nouns ( $n = 37$ )

Approximate sense	Frequency across nouns
Coward, one who is afraid	2
Grandma, granny	1
Processionary Caterpillar	1
Sacred (of object or ceremony), taboo, sacred area	1
Shame	1
Timid	1
Wild, feral animal	1

Australia (non-cognates), with "one or more of the senses 'anger', 'crowd', 'multitude', 'all', and the like" (Alpher, 2006, p. 5).

- (13) Ngan'gi, *ki*, nom.  
 "fight, argument"  
*Ki wayingngi tyuk.*  
 "I'm getting angry (Anger is hotting me up)." (Reid & McTaggart, 2008, pp. 56, 134)

**Table 12** Senses colexified in SORROW nouns ( $n = 30$ )

Approximate sense	Frequency across nouns
One who has no food, shelter or belongings	3
Worry, anxiety	3
Alone, loneliness	1
Changed for the worse	1
Heart	1
Heavy, the state of the spirit after one has been sorcerized, fierce pain from sorcery or some external cause	1
One who is pining for relatives	1
Swallow, eat	1
Trouble	1
Weak, lazy	1

The semantic associations of SHAME nouns, although more diverse, also feature behaviour and social events. SHAME nouns associate with socially evaluated behaviour (violation or respect of social norms), as seen in glosses in Table 4 above, and in Table 9. The expression of shame, avoidance, measured speaking registers and acting deliberately reserved are often markers of respect and frequently occur in respect relationships across the continent (e.g. mother-in-law, cross-sex sibling, etc.). We find this reflected in the colexifications between SHAME meanings and social avoidance, both physical and linguistic, which are closely intertwined with the experience of “shame” amongst many Australian groups (Bauman, 2002; Burbank, 2018; see also Malcolm, 2018, pp. 114–115 with respect to Aboriginal English; Ponsonnet, 2014). For example, Martuthunira *kurnta* (nom., v.) colexifies “shame” with socially determined behaviours, including “respect language style”, “to show respect” and “to speak respectfully” (Dench, 1994, p. 334). In (14) and (15), the colexified senses reveal the nouns’ anchorage in avoidance behaviour, namely hiding under cover (avoiding social exposure being a key characteristic of the SHAME cluster, as discussed in §3.2.3).

- (14) Gamilaraay, Yuwaalaraay, & Yuwaalayaay, *burriin*, n.  
 1. “shield, broad shield”  
 2. “cover (Yuwaalayaay only). Anything used as a cover.”  
 3. “shame (Yuwaalaraay only). Used in Walgett, an expression used when someone makes a mistake or gets caught out (a Charlie Kennedy word).” (Ash et al., 2003, p. 48)
- (15) Wiradjuri, *gijal*  
 adj. “ashamed”  
 n. “shame”  
 adj. “stung, dug into, ground down” (Grant & Rudder, 2005, p. 259)

Nouns in the LOVE cluster also associate with socially well-identified behaviours like sexual behaviours and relationships, whether appropriate or improper. Examples of a direct colexification with sex can be found in above, as well as in (16) below.

- (16) Kaytetye, *mpwenye*, nom.  
 “1. love, sex, romance, promiscuity”  
 “2. mating behaviour (of people and animals)” (Turpin & Ross, 2012, pp. 481–482)

Colexifications in the domain of social events and behaviours confirm that emotional meanings often occur in words based on pragmatically anchored EFFECT FOR CAUSE

metonymies, where the cause is an emotion, and the effect is the behaviour and/or the social event/interaction resulting from this behaviour (or vice versa). Such metonymic extensions are well known (Kövecses, 2000, 2002; Ponsonnet & Laginha, 2020). More specifically, our data suggest that while much emotional experience associates with behaviours in one way or another, not all emotional behaviours lead to the emergence of emotion nouns. Certain types seem more likely to open such semantic paths: where an emotion produces behaviours involved in well-identified and notable social conduct or social events, such as those involving disruption (e.g. fighting, adultery, avoidance), or on the contrary the reinforcement of social norms (e.g. polite or shy manners, respect language).

This linguistic pathway may highlight an underlying motivational process for emotion noun emergence: discussion of social norms causing or enabling more frequent emotion noun emergence. A tendency to criticize or justify a certain social behaviour (particularly that which is evaluated negatively or positively) with reference to emotion may explain why the behavioural pathway described in this section is prevalent in our data. Put another way, the colexification of emotion and behaviour in a single noun may reflect speakers consistently appealing to emotional reasons to explain social events that reinforce or challenge social norms (Robles & Weatherall, 2021). In turn, this could lead to the development of an independent referent: the associated emotion as a separate entity. This “functional” hypothesis also sheds further light upon the notion of “cultural salience” explored in §5.1.2. This idea, that the need to discuss social norms causes or enables more frequent emotion noun emergence, requires further investigation, including the examination of conversational interactions (Jefferson, 2015).

#### 4.2 Body-part associations

Twelve nouns across the FEELING, LOVE and SORROW clusters exhibit semantic associations with several body parts, as we can see from Tables 7–12 above. This is extremely clear with FEELING nouns, where nine nouns colexify the emotion with vital organs or parts of the torso (“belly”, “guts”, “lower chest”, “heart”, etc.). We also found colexifications with “inside”, known to be a possible extension of internal organ nouns (Kövecses, 2000, p. 145; Ponsonnet, 2014, p. 281; Wierzbicka, 1999, p. 277), as well as other internal body parts such as “nerves” and “flesh”, plus “seat of emotions” (and intellect, “thought”). Colexifications between abdominal body parts and seats of emotions, as illustrated in (17) for Nyangumarta, are more frequent than between body parts and emotions as such.

- (17) Nyangumarta, *ngarlu*, n.  
 1. “abdomen, belly, stomach”  
 2. “seat of emotions, ‘heart’” (Geytenbeek, n.d.)

The shift in meaning from a body-part to a FEELING sense is also noted for Dalabon *yolh-no* (n.) “pep, feelings”. Ponsonnet (2014, p. 183) describes that its etymology “probably relates to the abdomen”<sup>14</sup> but “[in] synchrony, *yolh-no* is not considered a body part (most speakers are not inclined to assign it to any bodily location, but see it as something

<sup>14</sup>As suggested by the tropes it attracts, and the meaning of cognates in neighbouring languages.

immaterial)". Therefore, a plausibly frequent semantic pathway leading to FEELING nouns is as outlined in (18), and potentially represented in all three stages in (3) above.

- (18) body part → bodily locus → emotional, i.e. immaterial  
 internal-organ noun → seat-of-emotions noun → FEELING noun

LOVE and SORROW also exhibit some body-part associations, albeit to a lesser extent. Several LOVE nouns colexify with "heart", "blood" and "throat". Outside of our own data, lexical associations between the throat and (the seat of) desire or affection are regularly noted for languages of Central Australia (Harkins, 1990; Musharbash, 2010a; Peile, 1997, p. 57 on Kukatja; Ponsonnet & Laginha, 2020; Turpin, 2002). This is illustrated in (19) for Pintupi/Luritja:

- (19) Pintupi/Luritja, *lirri*, *witanpa*, *yiwinytji*, and *yunytyu*, nom.  
 "Adam's apple; throat; desire; used figuratively for love, sex desire, desire for food and objects; love for wife, children and relatives" (Hansen & Hansen, 1992, pp. 49, 179, 200, 204–205)

SORROW nouns relate to a comparable set of body parts as LOVE and FEELING nouns. In (20) from Wajarri, *warritharra* involves the nominal *warri*, "stomach, both from outside (belly) and the organ, abdomen, viscera" (Mackman, 2012, p. 142), and the figurative connection between sorrow/grief and the belly/stomach has been noted in the literature on Australian languages (Ponsonnet & Laginha, 2020, p. 286; Turpin, 2002). In Kalaw Kawaw Ya, the noun in (21) appears to be a compound of *kaerkak(a)* (n) "throat" and *badh(a)* (n) "sore, cut, wound, graze, abrasion" (Ober & Kennedy, 2006).

- (20) Wajarri, *warritharra*, nom.  
 "sorrow, the feeling of pining for someone or something; a longing feeling towards someone or something; pangs of unhappiness" (Mackman, 2012, p. 143)
- (21) Kalaw Kawaw Ya, *kaerkabadh*, n.  
 "sorrow, sadness" (Ober & Kennedy, 2006)

The colexification of abdominal organs and the throat with emotions is not surprising given previous research has demonstrated that in Australian languages, the belly, heart, chest and throat are all routinely exploited as figurative sources for emotional expressions (Blakeman, 2015; Gaby, 2008; Peile, 1997; Ponsonnet, 2014; Ponsonnet & Laginha, 2020; Turpin, 2002; Wierzbicka, 1999). Beyond Australia, an association between feeling(s) and insides (i.e. internal organs) is not an uncommon polysemy (cf. Kövecses, 2000, p. 145; Sharifian, 2008; Wierzbicka, 1999, p. 277). Since body parts typically lexicalize as nouns, they offer natural pathways towards noun-lexicalization for emotions that associate with them.

What is more surprising and informative in our data, in comparison, is the *absence* of certain body-part colexifications. Non-internal body parts are not listed in Tables 7–12, despite many close associations to emotions in Australian languages (see Ponsonnet & Laginha, 2020). The head, eyes, nose and ears all feature in more emotion collocations across the continent than the chest and the throat, yet the former set does not appear to derive emotion nouns. According to Ponsonnet and Laginha (2020), there are resemblances in the way internal organs like the belly, heart, chest, as well as the throat behave with respect to figurative representations of emotions, contra visible body

parts (head, eyes, etc.). Abdominal organs (but not so much the throat) are often treated linguistically as the main seat of emotions in general and internal body parts more often partake in somatic rather than behavioural tropes. By contrast, many visible body parts attract behavioural tropes and target interactional emotions or attitudes. Our emotion-noun data suggest that emotions which associate figuratively with non-visible body parts (e.g. abdominal or internal organs, or the throat) can lexicalize as nouns for these body parts. Associations with visible, non-internal body parts, on the other hand, do not appear to channel noun lexicalization in the sample. We are not yet in a position to fully explain this somewhat counterintuitive result. We suggest that the availability of the behavioural route via the specific paths described in §4.1 takes precedence over a derivation from a behaviourally associated body part to emotion, and perhaps that the physiological experience of emotion is more closely associated with the abstract concept via the internal organs where sensation derives.

## 5. Explaining the semantic distribution of emotion nouns

So far, we have seen that in Australian languages, emotion nouns tend to converge towards a number of emotion categories, and likely develop from words associated with social behavioural norms, or from words for internal body parts. Equipped with this understanding, we can now consider our last research question (c): *why* are these emotions expressed by nouns more often than other emotions? Given the complexity of this question, this section remains largely speculative, but in doing so raises several key questions for future research.

### 5.1 Semantic pathways

The distribution of colexifications in our data suggests that emotion nouns favour certain semantic pathways for emergence, and this may be an underlying factor in the selection of categories. As we can see from Table 13, the emotion categories with the largest noun inventories tend to be those displaying common colexifications with non-emotional meanings. This correlation supports the hypothesis that the patterns of colexifications described in §4 do not only indicate potential routes travelled by emotional meanings, but also that the very availability of connections and routes in meaning in part affects the lexical prevalence of these emotions. Notwithstanding areal pressures towards semantic realignment, in this scenario the size of the noun inventory for a given semantic category would overall reflect how likely it is, for nouns in this category, to emerge. Even though nouns in better-represented categories presumably disappear (by shifting to different meanings again) at the same rate as nouns from rarer semantic categories, their cohorts contain larger numbers of recent members.<sup>15</sup> To extrapolate this theory: an emotion would be more likely to be expressed by a noun if it is associated with norm-transgressing or norm-abiding behaviour; and/or with an internal body part, particularly those treated linguistically as seats of emotion. How exactly these associations lead to lexicalization as nouns remains to be explored in future research.

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<sup>15</sup>There is some evidence of semantic shifts *across* emotional categories, but the numbers are too small to impact the bigger picture.

**Table 13** Number of colexifications by noun cluster paths.

	ANGER	FEELING	SHAME	LOVE	FEAR	SORROW	JEALOUSY	HAPPINESS	ANXIETY	HATRED	GREED	SURPRISE	CALMNESS	COURAGE	Other
Langs	28	24	24	23	23	19	16	13	10	5	5	4	3	3	5
Nouns	46	39	29	50	37	30	19	16	12	6	5	4	3	3	8
Paths	☺	♥	☺	☺/♥		♥									
Mean	1.09	1.05	1.14	0.56	0.22	0.47	0.05	0.12	0.05	0.33	0.2	0.5	0	0	

Note: ☺ = behavioural semantic pathway; ♥ = body-part semantic pathway. Mean: average (mean) number of colexifications with a non-emotional meaning, per noun.

These drivers, however, do not explain the data entirely. There are notable outliers such as the FEAR and JEALOUSY categories, which have few non-emotional colexifications compared to relatively large inventories, as well as SURPRISE, with the opposite pattern. Further data and in-depth linguistic enquiry on the lexicalization of these categories (across word classes and languages) will be required to explain these cases in the future. Meanwhile, below we briefly explore whether other drivers, pertaining to human physiology and cognition on the one hand (“nature”) as well as to “culture”, rather than to language, might also play a role. This brief discussion is mostly speculative, but lays the groundwork for further explorations in the future.

## 5.2 Extra-linguistic factors

Among other parameters that could influence which emotions come to be expressed as nouns are properties of the emotions themselves, or their status in human physiology and cognition. Looking at the semantic distribution of Australian emotion nouns, no obvious property of emotional experience jumps out as an explanation. Some of the emotions lexicalized as nouns are social (e.g. SHAME, JEALOUSY), others are not (e.g. FEELING, FEAR); some could be supposed to rank high on the scale of affectedness (e.g. ANGER, SHAME, FEAR), others not (FEELING, CALMNESS, COURAGE). We can note, however, that most of the emotions typically listed as “primary” emotions (see Ekman, 1992a, 1992b) – i.e. those corresponding to supposed universal neurophysiological responses resulting from selective evolution – feature in our data. From Ekman’s (1992a, p. 170) list “anger, fear, sadness, enjoyment, disgust, and surprise”,<sup>16</sup> only disgust is absent from Table 1.<sup>17</sup> On the other hand, many non-primary status emotion categories (e.g. FEELING, LOVE) are well-represented.<sup>18</sup>

Apart from properties of emotions and human cognition, we may also envisage cultural factors, which would vary depending on social organizations, lifestyle and so on. For the purpose of this study, Australia may be regarded as a relatively “unified” region, given commonalities in economic and social organization, as well as shared

<sup>16</sup>The significance of this exception may be qualified given that disgust is known to attract little lexicalization in general in Australian languages (Ponsonnet, 2014; Ponsonnet & Laginha, 2020).

<sup>17</sup>Other psychologists have proposed slightly different lists, but Ekman’s remains a strong reference.

<sup>18</sup>It may be useful to keep in mind that the emotions psychologists construe as “primary” are always lexicalized as nouns in English. This could mean that primary emotions are anglocentric in their definition. Or, if many languages in the world happened to have a comparable set of core emotion nouns as English, this could mean that primary emotions are emotions that are often labelled by nouns across the world’s languages. This labelling may or may not correlate with adaptive, physiological or neurological properties.

semantic trends (see for instance Gaby & Singer, 2014). In the absence of comparative data on emotion nouns for other parts of the world, we cannot tell whether the observed distribution reflects universal tendencies, or whether it is specific to Australia. This can be clarified relatively easily by future research, but in the meantime, we consider whether the emotion categories prevalent among Australian nouns are culturally salient among Australian groups.

Cultural salience is an eminently slippery concept. For the preliminary exploration carried out here, we treated the amount of explicit discussions in the literature (anthropological, linguistic or otherwise) as a proxy for it, with the assumption that the literature is itself indicative of the amount of discussions provided by speakers of the languages in question. For example, several authors have highlighted the role of “shame” as a social regulator and its importance in social interactions and kinship systems in Indigenous Australia (Bauman, 2002; Burbank, 2018; Harkins, 1996; Myers, 1979). This contrasts to pride for instance, which is rarely discussed in anthropological literature. Based on this measure, most of the largest clusters can be said to enjoy a degree of cultural salience (ANGER, FEELING, SHAME, LOVE, SORROW). This could reflect a circular relation: the existence of a noun for a given emotion could make it easier to talk about it; and subsequently enhance its salience for speakers. At the same time, the correlation between so-defined cultural salience and noun lexicalization is not categorical. Again, FEAR, in spite of its larger noun inventory, does not appear as a very strong cultural theme (although see Musharbash, 2010b). Greed and generosity, on the other hand, seem poorly lexicalized compared to the standards they are reported to represent in several Australian groups’ emotional and moral etiquette (Blakeman, 2013; Myers, 1986; Ponsonnet, 2014).

To conclude our consideration of “primary” status and cultural salience as factors in the lexicalization of emotions as nouns, we suggest they play some role but probably not a determining one. Emotions with large noun inventories are often culturally salient, but this is not strict (and we do not know whether lexicalization or cultural salience causes the other). It is possible that the high cognitive salience of certain emotions suffices to boost their lexicalizations, while for other emotions it is dependent upon other factors. All these hypotheses can be explored further once we are able to compare the semantic distribution of emotion nouns in Australian languages with other parts of the world.

## 6. Conclusion

In this study, we examined the semantic distribution of emotion nouns in a balanced sample of 57 Australian Indigenous languages, with a view to reveal and interpret the lexical prevalence of different types of emotional experience: their capacity to lexicalize as nouns. This investigation confirmed earlier observations that Australian languages tend to have relatively modest inventories of emotion nouns (notwithstanding sizeable emotion vocabularies across other word classes), and that certain categories of emotions are expressed by nouns more often than others, namely the semantic clusters we label: ANGER; FEELING; SHAME; LOVE; FEAR; and SORROW.

The colexifications in our data suggest that emotion nouns often emerge based on two relatively widespread patterns of colexification. A first productive semantic association is with behaviours that breach, or on the contrary emphasize, social norms. A second type is figurative association with internal body parts, particularly those treated as the seat of



emotions (to the exclusion of external, visible body parts). Our data also suggest that the availability of these semantic pathways may partly condition the very emergence of emotion nouns. That is, in Australian Indigenous languages, emotions associated with norm-eliciting behaviour and/or with internal body parts are more likely to be lexicalized as nouns given their likelihood to arrive at the aforementioned semantic pathways. The role of semantic pathways in driving the emergence of nouns cannot, however, explain all the data, and further research is needed to gain more insights into the role of universal cognitive factors, and cultural factors.

We hope that these initial results can feed and inspire further research on the lexical prevalence of emotions. Two particularly promising avenues to be explored are the lexicalization of emotions as nouns in other parts of the world (twin studies from other regions would greatly develop the observations made here), as well as testing whether the linguistic and non-linguistic predictors of lexicalization highlighted here for nouns, also apply in other word classes.

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No potential conflict of interest was reported by the author(s).

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## Data availability statement

The data that support the findings of this study are openly available from referenced resources in the public domain, listed in Appendix A, except for assorted data for Jaminjung, Ngarla, Nyangumarta and Nyungar (which were shared from private sources). This article was adapted and developed from Yacopetti’s Honours thesis.

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- Wierzbicka, A. (1999). *Emotions across languages and cultures: Diversity and universals*. Cambridge University Press.
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## Appendix A. Data sources, by language

The following source list uses the format:

**Language**<sup>19</sup> [ISO639-3 code], family (Pama-Nyungan classification<sup>20</sup>), PART-OF-SPEECH CLASSIFICATION<sup>21</sup>

<sup>19</sup>The spelling of language names used in this research is as per each language’s main source.

<sup>20</sup>As per Bouckaert et al. (2018).

- Alyawarr** [aly], Arandic (Pama-Nyungan), NOMINAL  
 Green, J., Blackman, D., & Moore, D. (Eds.). (2019). *Alyawarr to English dictionary* (2nd ed.). IAD Press.
- Anindilyakwa** [aoi], Gunwinyguan (non-Pama-Nyungan), NOUN  
 Bednall, J. (2020). Feeling through your chest: Body-based tropes for emotion in Anindilyakwa. *Pragmatics and Cognition*, 27(1), 139–183.
- Arabana-Wangkangurru** [ard-wgg], Arabana and Wangkanguru (Pama-Nyungan), NOUN  
 Hercus, L. A. (1989–1990). *Machine-readable files of Arabana and Wangkangurru vocabulary*. AIATSIS Electronic Resources, (ASEDA 0238).
- Arrernte** [aer], Arandic (Pama-Nyungan), NOMINAL  
 Green, J. (2005). *A learner's guide to Eastern and Central Arrernte*. IAD Press.  
 Henderson, J. & Veronica D. (Eds.). (1994). *Eastern and Central Arrernte to English dictionary*. IAD Press.
- Bininj Kunwok** [gup], Gunwinyguan (non-Pama-Nyungan), NOUN  
 Bininj Kunwok Regional Language Centre. (n.d.). *Bininj Kunwok: Pan-dialectal dictionary*. <https://njamed.com/>  
 O'Keeffe, I., Coleman, C., & Singer, R. (2020). The expression of emotions in Kunbarlang and neighbouring languages in multilingual Arnhem Land. *Pragmatics and Cognition* 27(1), 83–138.
- Burarra** [bvr], Gunwinyguan (non-Pama-Nyungan), NOUN  
 Glasgow, K., & Glasgow, D. (2011). *Burarra–English interactive dictionary*. <https://ausil.org.au/Dictionary/Burarra/lexicon/main.htm>.
- Dalabon** [ngk], Gunwinyguan (non-Pama-Nyungan), NOUN  
 Ponsonnet, M. (2014). *The language of emotions: The case of Dalabon (Australia)*. John Benjamins.
- Diyari** [dif], Karnic (Pama-Nyungan), NOUN  
 Austin, P. K. (2017, Nov). “The children are by fear on the centipede”: The expression of emotions and perceptions in the grammars of some Australian Aboriginal languages. University of Dusseldorf Seminar, Dusseldorf, Germany. *A Dictionary of Diyari, South Australia*. [https://www.academia.edu/2491259/A\\_Dictionary\\_of\\_Diyari\\_South\\_Australia](https://www.academia.edu/2491259/A_Dictionary_of_Diyari_South_Australia)
- Gaagudju** [gbu], Isolate (non-Pama-Nyungan), NOUN  
 Harvey, M. (1992). *The Gaagudju people and their language* [Doctoral dissertation, University of Sydney]. Sydney eScholarship Repository. <https://ses.library.usyd.edu.au/handle/2123/8203>.
- Gamilaraay, Yuwaalaraay, & Yuwaalayaay** [kld], Central NSW (Pama-Nyungan), NOUN  
 Ash, A., Giaccon, J., & Lissarrague, A. (Eds.). (2003). *Gamilaraay, Yuwaalaraay, & Yuwaalayaay dictionary*. IAD Press.
- Gija** [gia], Jarragan (non-Pama-Nyungan), NOUN  
 Kofod, F. M., & Crane, A. (2020). The body and the verb: emotion in Gija. *Pragmatics and Cognition*, 27(1), 209–239.
- Gumbaynggirr** [kgs], Gumbaynggiric (Pama-Nyungan), NOUN  
 Morelli, S. (2015). *Gumbaynggirr dictionary and learner's grammar = Gumbaynggirr bijaarr janday-gam, ngaawa gugaarrigam* (2nd ed.). Muurrbay Aboriginal Language and Culture Co-operative.
- Gurindji** [gue], Ngumpin-Yapa (Pama-Nyungan), NOMINAL  
 Meakins, F., McConvell, P., Charola, E., McNair, N., McNair, H., & Campbell, L. (Eds.). (2013). *Gurindji to English dictionary*. Batchelor Press.
- Jaminjung** [djd], Djamindjungan (non-Pama-Nyungan), NOUN  
 Schultze-Berndt, E. (n.d.). *Jaminjung Ngaliwurru dictionary*.
- Jawoyn** [djn], Gunwinyguan (non-Pama-Nyungan), NOUN  
 Merlan, F., & Jacq, P. (2005). *Jawoyn–English dictionary and English finder list*. Diwurruwurru-Jaru Aboriginal Corporation.

<sup>21</sup>Part-of-speech classification refers to whether the grammar of a language defines a NOMINAL word class, or a NOUN word class. The latter label includes those languages where a source identifies a subdivision into nouns (versus adjectives) within a nominal class, based on morphological, syntactic or semantic criteria.

- Jingulu** [jig], Djamindjungan (non-Pama-Nyungan), NOUN  
Pensalfini, R. (1997). *Jingulu grammar, dictionary and texts* [Doctoral dissertation, Massachusetts Institute of Technology]. DSpace@MIT. <https://dspace.mit.edu/handle/1721.1/10347>.
- Jiwarli** [dze], Ngumpin-Yapa (Pama-Nyungan), NOMINAL  
Austin, P. (1992). *A dictionary of Jiwarli: Western Australia*. La Trobe University.
- Kalaw Kawaw Ya** [mwp], Pama-Maric (Pama-Nyungan), NOUN  
Ober, D., & Kennedy, R. (Eds.). (2006). *Kalaw Kawaw Ya dictionary*. AIATSIS Electronic Resources, (ASEDA 0485).
- Kaurna** [zku], Thura-Yura (Pama-Nyungan), NOUN  
Amery, R. (2020). Emotion metaphors in an awakening language: Kaurna, the language of the Adelaide Plains. *Pragmatics and Cognition*, 27(1), 272–312.
- Kayardild** [gyd], Tangkic (Pama-Nyungan), NOUN  
Evans, N. (1992). *Kayardild Dictionary and Thesaurus: A vocabulary of the language of the Bentinck Islanders, North-West Queensland*. University of Melbourne.
- Kaytetye** [gbb], Arandic (Pama-Nyungan), NOMINAL  
Turpin, M., & Ross, A. (Eds.). (2012). *Kaytetye to English dictionary*. IAD Press.  
Turpin, M. (2002). Body part terms in Kaytetye feeling expressions. In N. J. Enfield & A. Wierzbicka (Eds.), *The body in description of emotion, Pragmatics and Cognition* (pp. 271–303). John Benjamins.
- Kukatja** [kux], Wati (Pama-Nyungan), NOMINAL  
Peile, A. R., & Clynes, A. (n.d). *Kukatja dictionary*. AIATSIS Electronic Resources (ASEDA 0023).
- Kuku-Yalanji** [gvn], Pama-Maric (Pama-Nyungan), NOUN  
Hershberger, H. D., & Hershberger, R. (Eds.). (1986). *Kuku-Yalanji dictionary*. Summer Institute of Linguistics.
- Kunbarlang** [wlg], Gunwinyguan (non-Pama-Nyungan), NOUN  
O’Keeffe, I., Coleman, C., & Singer, R. (2020). The expression of emotions in Kunbarlang and neighbouring languages in multilingual Arnhem Land. *Pragmatics and Cognition*, 27(1), 83–138.
- Kuuk Thaayorre** [thd], Pama-Maric (Pama-Nyungan), NOUN  
Hall, A., & Foote, T. (1992). *Kuuk Thaayorre Dictionary*. AIATSIS Electronic Resources (ASEDA 0441), Australian Institute of Aboriginal and Torres Strait Islander Studies, Canberra, ACT, Australia.  
Gaby, A. R. (2008). Guts feelings: Locating emotion, life force and intellect in the Thaayorre body. In F. Sharifian, R. Dirven & Y. Ning (Eds.), *Body, culture and language: Conceptualizations of internal body organs across cultures and languages* (pp. 27–44). Mouton de Gruyter.
- MalakMalak** [mpb], Daly (non-Pama-Nyungan), NOUN  
Lindsay, B. Y., Pirak, R., Mijat, F., & Hoffmann, D. (2017). *A dictionary of MalakMalak*. [https://drdorotheahoffmann.files.wordpress.com/2017/11/10\\_17\\_2017\\_malakmalak-dictionary\\_complete.pdf](https://drdorotheahoffmann.files.wordpress.com/2017/11/10_17_2017_malakmalak-dictionary_complete.pdf).
- Mara** [mec], Gunwinyguan (non-Pama-Nyungan), NOUN  
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