To appear in *Australian Journal of Linguistics*

Title:

Rations: Flour, sugar, tea and tobacco in Australian languages

Authors: (joint first authors; see acknowledgements section for author contributions)

Vicky Hoogmartens, University of Leuven, vicky.hoogmartens@gmail.com

Jean-Christophe Verstraete, University of Leuven & Australian National University, jcv@kuleuven.be

Abstract:

This paper is a lexical study of rations – flour, sugar, tea and tobacco – in Australian languages. The distribution of food played an important role in relations between Aboriginal people and colonisers: this study complements existing historical and ethnographic work on the topic by investigating the lexicon of rations in a set of 197 languages across Australia. We discern a number of patterns. There are relatively few extensions of terms for traditional equivalents in the case of 'flour', 'sugar' and 'tea', for a number of reasons, while tobacco shows more such extensions. Extensions based on other terms highlight semantic features like texture for flour and sugar, shape of the main ingredient for tea, and smoking as the new mode of consumption for tobacco. Other minor patterns highlight colour, processing and flavour. There is also some areal patterning in the data, some related to borrowing, from Austronesian languages as well as internally, and others based on semantic structure.

Keywords:

Australian languages

lexicon

introduced products

semantics

areal patterns

1. Introduction

The distribution of food played a central role in relations between European colonisers and Australian Aboriginal people, first as an apparent gesture of goodwill, and later also as a means of control or meagre in-kind payment, on pastoral stations, missions and reserves (see Foster 1989, 2000, Rowse 1998). The core of food distribution were so-called rations (derived from standard "working man's rations", Foster 2000) consisting of flour, sugar, tea and later also tobacco – dry goods that are easy to store and transport over longer distances, and in the case of sugar and tea intrinsically linked to colonial industries elsewhere in the British empire (Mintz 1985). Rations were attractive because they were less labour-intensive than traditional equivalents, and no doubt also because they had novelty value and were addictive in the case of tobacco (Foster 2000).

This paper is a lexical study of terms for 'flour', 'sugar', 'tea' and 'tobacco' in Australian languages, using a set of 197 languages – as many as we could find lexical data for and probably close to the maximum that could be studied in a reliable way. This study complements existing historical work on the topic by providing a linguistic perspective on an important aspect of relations with European colonisers. The analysis focuses mainly on semantic patterning, in two ways. One aspect of the analysis concerns lexical relations with traditional equivalents where they are available, viz. products of seed-grinding and starch extraction for flour; sugarbag, nectar, gum and lerp for sugar; and native tobaccos for tobacco (there is no obvious equivalent for tea, most plant-based infusions were medicinal). The second aspect of the analysis concerns the great diversity of other patterns of semantic extension, based on perceptual features like texture, shape, colour or flavour, or aspects of preparation or consumption. Beyond semantic patterning, we also investigate some instances of areal patterning in the data, and we provide a basic description of loans, mainly from English or English-based contact languages, but also loans based on contacts with 'Macassan' traders in Australia's north. Apart from the historical and ethnographic interest of the topic, this study also adds to a number of earlier lexical studies of introduced phenomena, like horses (Walsh 1992), alcohol (Nash 1998), policemen (McGregor 2000), work (Simpson 2016) and wheeled vehicles (Nash 2020).

This study is organised as follows. Section 2 describes the data set: the languages studied, the sources used, the principles used to excerpt and analyse data, and the way the data are organised. The full data set is available as an electronic appendix to this paper. Sections 3-6 discuss the analysis for 'flour', 'sugar', 'tea' and 'tobacco', respectively. Each section starts

with a general survey of the relevant patterns and their distribution, followed by a discussion of terms based on traditional equivalents, terms based on other patterns of extension, and loans. The conclusion in section 7 brings together some common threads, especially as concerns the relative rarity of terms based on traditional equivalents, the distribution of features that play a role in other patterns of semantic extension (texture, shape, flavour, colour and aspects of processing and consumption), and areal patterns in the data.

2. Data and background

2.1. Languages

This study is based on data from 197 Australian languages, excerpted from dictionaries, word lists, grammars and text collections. The full list of languages can be found in Appendix 1, as well as in the 'languages' sheet of the data table in Appendix 2, where each language is listed with a reference to the source or sources used, and its genetic status. (To save space, references to sources are not repeated in the list of references at the end of this paper.)

The set of languages is a convenience sample, basically determined by what sources we were able to locate and access. Still, 197 languages is probably close to the maximum that could be studied in a reliable way. Counts of Australian languages vary: the number traditionally cited is around 250 (Dixon 2002: 2), but more recent counts suggest numbers up to about 390 (Bowern 2012). However, these higher counts cover a large number of dialects, clan varieties and very closely related languages, which are often documented together with one of the languages in the lower counts (or remain largely undocumented). In terms of well-documented varieties, therefore, it is unlikely that the data set could be increased with much more than a few dozen languages.

In terms of genetic coverage, the sample contains 137 Pama-Nyungan languages, 59 so-called 'non-Pama-Nyungan' languages, and 1 'Papuan' language from the eastern Torres Strait. For Pama-Nyungan languages, the appendices list genetic status down to five levels, i.e. from the highest-level subgrouping proposed in Bowern & Atkinson (2012) down to the lowest-level subgrouping that is commonly accepted in the literature (repeated with '>' at lower levels for ease of ordering in Appendix 2). Uncertain subgrouping is marked with a question mark. The sample covers all such lower-level subgroups (as mentioned in Bowern & Atkinson 2012, plus Verstraete 2020 for subgrouping of Paman languages), except for Yardli and Durubalic. For 'non-Pama-Nyungan' languages, the appendices list at most two levels,

with subgrouping mentioned where it is well-recognised. The sample covers all relevant families and isolates mentioned in Evans (2003), except for Kungarakany. Areal coverage of the full set of languages is represented in the map in Figure 1 below (using dots rather than language names or numbers, to avoid visual clutter). As can be seen, most of the continent is represented, though with somewhat lower numbers for the southeast and the southwest, as could be expected for regions where documentation is more limited due to the effect of early contact.

Figure 1 here

2.2. Sources and data

Data are typically excerpted from the most comprehensive or authoritative source we had access to. In a few cases we use more than one source, for instance a grammar and a word list, or a word list and a community dictionary. These are listed on separate lines in the 'languages' sheet of Appendix 2 (available under DOI 10.6084/m9.figshare.13187006), with a distinct identifier to which data can be linked.

Data are listed in four separate sheets in Appendix 2, one each for 'flour', 'sugar', 'tea' and 'tobacco'. Each term is listed together with a language name and source identifier (relevant if there is more than one source), a field for the translation or gloss as found in the source, a field for comments (like glosses of component parts or other relevant information), and a field that classifies the term in terms of the categories used in sections 3-6 below. The absence of a relevant term for a particular language is marked with 'x' in the 'lemma' field.

For each language, we list all relevant terms for 'flour', 'sugar', 'tea' and 'tobacco'. If a term has more than one meaning or referent, it is not always possible to distinguish between polysemy and vagueness, but obvious instances of generic terms are excluded (for instance a generic term for all plant foods that also happens to cover 'flour'). Forms based on English are included if there appears to be some type of semantic or phonological adaptation (the latter as suggested by the orthography). In the case of 'flour' and 'tobacco', we only list terms that include reference to introduced flour and tobacco: terms for 'native' equivalents, like native flour and various types of native tobacco, are only included in the data set if they have been extended to cover introduced flour and tobacco (though such forms are occasionally used in the analysis, see sections 3.1 and 6.1 below). In the case of 'tobacco', we include terms for different types of tobacco (for instance chewing versus smoking tobacco, or block

tobacco versus loose tobacco), as well as cigarettes. In the case of 'tea', we include terms for tea leaves and for brewed tea; often the sources do not allow us to determine what the precise reference is. If the difference in referent plays a role, we mention this explicitly in the analysis.

In total, our data set has 830 terms: 141 for 'flour', 172 for 'sugar', 227 for 'tea' and 290 for 'tobacco'. In many instances we have several terms from one language, sometimes with different referents (e.g. separate terms for tea leaves and brewed tea) but often as apparent synonyms without much further information. We are aware of potential 'layering' effects between sources and languages, where some sources or languages may represent different layers of contact, for instance with less (or more) influence from English. In Umpithamu, for example, a term for 'flour' based on 'dust' that was recorded in the early 1970s, had by the early 2000s been replaced by the English term, and when prompted was described as an 'old word' (Verstraete 2020). It is not really possible to deal with this in any adequate way on the basis of the sources we have, but we hope that the large size of the sample can compensate for such effects.

2.3. Historical background

We will not try to summarise the historical and ethnographic work on the distribution of flour, sugar, tea and tobacco in any comprehensive way, but simply refer to relevant sources and sketch a few general findings.

The distribution of 'rations' is a well-known trope in the relations between European colonists and Aboriginal people, but there are relatively few specific studies of the phenomenon. Nettelbeck & Foster (2012) appears to be the only continent-wide historical study of rationing, set in the broader context of British colonial policies. Apart from that, the situation in South Australia and the Northern Territory (part of South Australia until 1911) is probably the one that has been explored in most detail, with studies like Foster (1989, 2000), Rowse (1998) and Brock (2008). Aspects of rationing in other parts of the continent are discussed in general reference works (like the different chapters in McGrath 1995), studies of early colonialism or the pastoral industry (like Mitchell 2011, Smith 2000 or Jebb 2002), and analyses of shifts in nutrition (like Kouris-Blazos & Wahlqvist 2000, Lee & Ride 2018). Among the four products studied here, tobacco has also been subject to a few more specific studies, like Thomson (1939) and Brady (2002, 2013) (who note that non-native tobacco was

actually first introduced by Macassan traders in the north, before the introduction by European colonists).

Historical and ethnographic studies on food distribution focus mainly on policies and motivations for distributing food, the products being distributed, and/or on the effects on the Aboriginal populations. Motivations appear to have been varied and evolving over time, from 'feasts' as apparent gestures of goodwill in early colonial contexts, over compensation for lost food resources and food as a means of pacification, to outright control and/or meagre payment on missions, reserves and pastoral stations (Nettelbeck & Foster 2012). The goods distributed included not just food but also clothes and blankets (see Martinez 2007, Brock 2007). Flour, sugar and tea were the core of food rations (a term apparently derived from standard "working man's rations", Foster 2000) – dry goods that are easy to store and transport over longer distances. These were later also supplemented with meat and tobacco, and in some cases with rice and sago (Foster 2000). The effects of rations on the health of Aboriginal populations were profound, including addiction to tobacco, and shift to a diet rich in refined carbohydrates and poor in fibre and vitamins (Gracey 2000, Lee & Ride 2018). This section only provides a thumbnail sketch of what the relevant literature has to offer: for more details, the reader is referred to the sources cited above.

3. Flour

Patterns in the terminology for 'flour' are summarised in Table 1 below and mapped out in Figure 2 (only for the major patterns, excluding English-based loans).

Table 1 here

Figure 2 here

The most surprising pattern in the data is the relatively low number of 'traditional' terms for flour extended to cover European flour. Given that seed grinding and starch extraction were practiced in many parts of the continent, why were traditional terms not used more often? This is discussed in section 3.1. Section 3.2. discusses other patterns of semantic extension, based on texture, colour and the baking process, while section 3.3 discusses loans, mainly from English but also a well-known areal pattern of 'Macassan' loans.

3.1. Traditional flour

The grinding of seeds was widely distributed throughout the continent, to produce a dough-like substance that can be eaten raw or is baked into a damper. The distribution of grinding implements, as mapped by Davidson & McCarthy (1957: 440), suggests that most of the continent had some kind of technology for grinding seeds (which may also have had some non-food uses, like grinding pigments or sharpening tools). Tindale (1974: 99) specifically mapped the exploitation of grain-type seeds in grasslands, a broad inland arc roughly parallel to the western, northern and eastern coastlines. Within and beyond this region, seeds of other types of plants like trees, shrubs or waterlilies were processed in a similar way (see Clarke 2007: 85-89, Isaacs 2002: 107-115). There were also other ways to produce flour-like substances from plants, specifically the extraction of starch from tubers and nuts, often as part of a more extensive process to remove toxins (see Clarke 2007: 89-91, Isaacs 2002: 101-102, Roth 1901: 10).

Given how many 'traditional' equivalents there were, made from grains as well as other types of seeds and plants, it is surprising that we only find a relatively small proportion of traditional terms extended to cover European flour. One reason for this may be the common pattern whereby a particular flour-like product is named after its source plant, rather than with any general term referring to flour or dough, as illustrated in (1) and (2) below.[1]

(1) Umpithamu (Pama-Nyungan > Middle Paman; Verstraete 2020)
atithal '1 mangrove pods, mangrove beans [*Bruguiera gymnorhiza*], 2 mangrove porridge'

(2) Yandruwandha (Pama-Nyungan > Karnic; Breen 2004)
ngardu 'nardoo; the plant *Marsilea drummondii*, a small plant growing on low-lying areas after rain, and also the flour prepared from the spore cases of this plant'

Semantic specificity is not necessarily a problem, however: as shown in section 4.1 below, specific terms for 'sugarbag' or native honey have been extended to 'sugar', from an inventory that typically has a range of specific types and no generics (see Si & Carew 2018).

[1] Some languages do appear to have general terms, however, compare Dalabon *ngolk-no* '1 flour, 2 paste' (Evans, Merlan & Tukumba 2004).

A more important reason for the rarity of traditional terms may relate to the way seeds are processed, which typically results in a product that has a very different texture from European flour. In the case of the typical European flour, grinding is a 'dry' process, that results in a dry, powder-like substance. By contrast, traditional grinding of seeds in Australia typically involves the addition of water (see Clarke 2007: 88, Isaacs 2002: 109, Latz 1995: 49-56),[2] resulting in a product that is more like porridge or gruel. Clarke cites an explorer's account of seed-grinding along the Darling River that gives a good idea of the difference: "One large flat stone was laid on the ground, some seed put upon it and a smaller stone worked round with the hands, water occasionally being added; when finished it had much the appearance of our gruel." (Newland 1890: 22 cited in Clarke 2007: 85).

In this sense, it is not surprising that local terms were relatively rarely extended to cover European flour, which may have been produced in a similar way or from a similar plant, but looked (and probably tasted) very different. This is actually confirmed by a closer investigation of those cases where a traditional term is used for European flour. Out of the 10 certain instances in our data set, 6 are not, in fact, based on terms describing the result of seed-grinding, but terms for the result of starch extraction from roots, fruits or nuts, as illustrated in (3) and (4) below (most of these found in or near Cape York Peninsula). The product resulting from such processes is more similar in texture to European flour than the gruel-like paste produced by seed grinding.

(3) Yir Yoront (Pama-Nyungan > Southwest Paman; Alpher 1991)
may-kaprr 'flour as of yams or mangrove fruit or wheat'

(4) Kuku Yalanji (Pama-Nyungan > Northern > ?; Hershberger & Hershberger 1986)
bujal 'crushed edible food, as zemia nut, powdered as flour, or European wheat flour'

3.2. Other extensions

In contrast to traditional terms, the more common patterns of semantic extension in the data set are based on texture, colour, and, in a minor way, the baking process. Terms based on flavour are absent, unlike with sugar, tea and tobacco, which is perhaps not surprising given that flour is more of a staple than a delicacy or treat.

[2] Isaacs (2002: 109) mentions that harder seeds like *Acacia* seeds could be dry-milled, though Latz (1995: 51-52) also describes wet milling.

The most common pattern involves terms for a dust-like substance, sometimes in combination with a ‘plant food’ generic. These are most commonly based on terms for ‘dust’ or ‘ashes’, as shown in (5) and (6) below, but also general terms for powdery substances, as in (7), and even terms that may be metonymically related to it, like ‘dry’ or ‘fog’, as in (8)-(9).

(5) Yukulta (Tangkic; Keen 1983)
tyulkuwa ‘ashes, flour’

(6) Arrernte (Pama-Nyungan > Arandic; Henderson & Dobson 1994)
ulpmerre ‘1 fine, soft dirt, bulldust, 2 flour’
[choice of generic distinguishing between the two]

(7) Pitjantjatjara (Pama-Nyungan > Wati; Goddard 1996)
urlu ‘flour, powder’

(8) Kaytetye (Pama-Nyungan > Arandic; Turpin & Ross 2011)
artwerrtye ‘1 dry, 2 thick (liquid), 3 flour’

(9) Arrernte (Pama-Nyungan > Arandic; Henderson & Dobson 1994)
ulpmenthe ‘1 flour, 2 fog, mist’

As already mentioned, the dry, powdery nature of European flour would have stood out in contrast to local equivalents, so it is not surprising to see this as a frequent basis for naming. The same applies to colour: while the paste produced by traditional grinding of seeds is relatively dark, European flour is light in colour (as are, once again, the starches extracted from tubers or fruits). Extensions of terms for ‘white’ are found in 7 languages, either the basic colour term, as in (10), or a substance with that colour, as in (11). Some of these substances may also be powder-like, as illustrated by the extension from white chalk in (12). In some cases the extension is only attested indirectly, in the way referents are joined under more abstract terms in respect varieties, as in (13).

(10) Ungarinyin (Worrorran; Coate & Elkin 1974)
iroroy ‘white one (used of flour)’

(11) Anindilyakwa (Gunwinyguan; Van Egmond 2012)
a-mv-dhvngvra

NEUT-INALP-FEM.white.clay[3]

'flour'

(12) Wakaya (Pama-Nyungan > Warluwarric; Breen 1974)

pulurnmu 'flour, white chalk'

(13) Bininj Kunwok (Gunwinyguan; Evans 2003)

kabarrh 'flour (avoidance register)'

[covers both *delek* 'white clay' and *kandidjawa* 'flour; damper' (Evans 2003: 65)]

The final set of extensions appear to relate to the baking process. There are three terms based on 'raw', highlighting the uncooked nature of the flour, and there is one term (for self-raising flour) based on 'puffed up', highlighting the result. There are two terms for 'eye', both from the same language, which the author relates to the preparation of flour ("at a certain stage of its preparation it must look something like an eye: a hole is made in the middle of a mound of flour, and water poured in; it is then kneaded for some time from the centre", Dixon 1972: 327). The three patterns are illustrated in (14)-(16) below.

(14) Wardaman (Wardaman/Wagiman; Merlan 1994)

mayin ma-gan.gin

veg.food NC-raw

'flour'

(15) Kaytetye (Pama-Nyungan > Arandic; Turpin & Ross 2011)

arlware '1 baking powder, self-raising flour, 2 puffed up'

(16) Dyirbal (Pama-Nyungan > Northern > ?; Dixon 1972)

balam gayga-mali

NC.III eye-PURP.VBLZ

'flour' (lit. 'in order to make an eye')

3.3. Loans

The data set contains a large number of loans from English, most typically *flour*, but also two areal patterns of loans with a different origin: one in the Top End involving a well-known

[3] Abbreviations used in glosses are FEM feminine, INALP inalienable possession, INTR intransitiviser, NLZ nominalization, NC noun class, NEUT neuter, PURP purpose, VBLZ verbalizer.

Macassan loan identified in Evans (1992) and another centred on the Pilbara region involving a term that may originate in a term for ‘crushing’.

English loans based on *flour* show the adaptations one would expect given the typical phonological patterning of Australian languages, specifically the lack of (heterorganic) consonant clusters in word-initial position and the relative rarity of phonemic fricatives (see Baker 2014). The two most typical patterns in the data are a form where the initial cluster is simplified to a lateral, as in (17), or a form where a vowel is inserted between the labial and the lateral, with the labial fricative shifting to a plosive, as in (18). Apart from *flour*, there is also one instance of a loan of *damper* metyonypically extended to ‘flour’, as in (19), and a form that is analysed as based on a quality term (*very good*; von Brandenstein 1988: 3), in (20).[4]

(17) Ngan’gityemerri (Southern Daly; Reid & McTaggart 2008)
lawa ‘flour, bread, damper’

(18) Gathang (Pama-Nyungan > Yuin-Kuri; Lissarrague 2010)
bulaawa ‘flour’

(19) Warlpiri (Pama-Nyungan > Ngumpin-Yapa; Swartz 2012)
tampa ‘damper, flour’

(20) Nyungar (Pama-Nyungan > Nyungar; von Brandenstein 1988)
bara-good ‘flour’

Along the Top End of Australia, there is an areal pattern of terms based on a Makassarese loanword, which originates in visits of ‘Macassan’ traders to Australia’s northern shores to catch and process trepang for the Asian markets, from at least the 17th century (though see Clark & May 2013 for a review of evidence suggesting earlier dates). Evans (1992) identified the Makassarese term *kanrejawa* ‘pastry, cake, biscuit’ as the origin of a term for ‘damper’ and/or ‘flour’ in various Iwaidjan languages, as well as two Maningrida languages and one Gunwinyguan language, which suggests a broad areal pattern crossing several genetic boundaries. This is confirmed in our data set, which adds Giimbiyu,

[4] There is also a term *aachich*, found in Wik Mungkan and Wik Ngathan, which Sutton (1995) analyses as originating in a loan based on *ashes-damper*. The term may be somewhat complex, however, because in Wik Mungkan it refers to a traditional type of flour made from arrowroot (Kilham et al. 2011).

and one extra Maningrida and Gunwinyguan language each, illustrated in (21) and (22).[5] The original Makassarese term obviously referred to baked goods; this suggests a metonymic bridge from 'damper' to 'flour', which is the only reference in at least some of the languages that have borrowed the term.

(21) Giimbiyu (Giimbiyu; Birch 2006)
kandidjaw 'flour'

(22) Nakkara (Maningrida; Eather & Kalamirnda 2005)
kandiddjawa 'damper, flour, bread'

Finally, in and around the Pilbara in Western Australia there is a set of 12 languages using a term *yurntura* or *yuntura*. Given the genetic diversity of the languages involved (Marrngu, Ngayarta, and Kanyara-Mantharta for Pama-Nyungan, as well as a Nyulnyulan language), this is most likely an areal pattern based on a loan scenario. The semantic basis is unclear, but there are some indications that earlier reference may have been to 'powder', itself possibly derived from a term for 'crushed' (Dench p.c.). There are two instances where the form refers both to 'flour' and 'powder', as illustrated in (23) below; as reported by Dench (p.c.) this may itself originate in a term for 'crushed', as suggested by two further languages showing a pattern of polysemy with 'crushed', as illustrated in (24).

(23) Martuthunira (Pama-Nyungan > Ngayarta; Dench 1994)
yurntura 'powder, flour'

(24) Ngarluma (Pama-Nyungan > Ngayarta; Wangka Maya 2008)
yurndara [sic] 'flour'; yurndura 'squashed, crushed'

4. Sugar

Patterns for 'sugar' terms are summarised in Table 2 below, and mapped out in Figure 3 (excluding English-based loans and very minor patterns).

[5] Evans (1992: 74) also links the Mara form *gandirri* 'flour, food' (Heath 1981) to the Makassarese form *kanre* 'food, cooked rice', itself probably a component of *kanrejawa*. In our data, a similar form is found in Ritharrngu *gandiri* 'flour, damper' (Heath 1980) and Warumungu *kantirri* 'flour, food, bread' (Simpson 2006). The Warumungu form could be a loan from Mara or another language that borrowed it from Makassarese.

Table 2 here

Figure 3 here

Extensions of terms referring to traditional sources of sweetness are somewhat more common in the data than for ‘flour’, though still not the most common pattern overall, as discussed in section 4.1. Other types of extensions, based on texture and to a much lesser extent flavour, are discussed in section 4.2. Loans and related patterns are discussed in section 4.3.

4.1. Traditional sources of sweetness

Traditional sources of sweetness include native honey or ‘sugarbag’, as well as nectar from flowers and various plant secretions, like gum (resin) from trees, or lerp, an insect secretion found on trees (Clarke 2007: 79-80, Isaacs 2002: 130-139). Sugarbag is found across the tropical north and into the central deserts, as well as on the east coast down to southern New South Wales (see Dollin et al. 2015; also Heard 2016, Si & Turpin 2015). It is usually eaten raw but can also be soaked in water. Other regions relied on honey ants, nectar, gum or lerp as sources of sweetness. Nectar was most typically soaked in water to produce a sweet drink, but could also be sucked straight from the flowers. Gum and lerp could be consumed either way (Isaacs 2002: 136-138).

Terms for native honey are the most common traditional source of sweetness to be extended to ‘sugar’ in the data set (and in some cases to other introduced sweets like jam or treacle). Sugarbag terminology is often quite complex, with names for various types of sugarbag (for instance relating to size of the bees, location of the nest or presence of an entrance tube, see Si & Carew 2018), as well as the component parts of sugarbag, like wax, pollen, brood and the honey itself. The lexical data are usually not detailed enough to determine whether the relevant ‘sugar’ term is based on a term for a specific type of sugarbag, sugarbag in general, or the honey part of sugarbag, but in some cases it is clear, like a specific type of sugarbag in (25) or a generic term in (26).

(25) Jingulu (Mindi; Pensalfini 2011)
wangkurra ‘1 male sugarbag (in tree, on top, sweet taste), 2 honey, jam, sugar, any sweet thing (by extension), 3 native bee, honey bee’

(26) Ndjébbana (Maningrida; Coleman 1991)

djábbarnma ‘honey. This is the generic term for all kinds of honey. It is also used to refer to anything which is very sweet, like honey, such as sugar syrup.’

Sugarbag terms are limited to the zone where native honey occurs (with New South Wales South Coast languages [NSWSC] as the most southerly instance, although it is not entirely certain that the relevant term refers to native honey).[6] However, this zone also has many other terms for ‘sugar’, including the very common type based on terms for ‘sand’ found all over the continent. This suggests that the different texture of sugar – an unusual crystalline structure – may be more prominent than the resemblance in flavour to a traditional food source.

Beyond the ‘sugarbag zone’, terms for nectar, gum and lerp are relatively rarely extended to ‘sugar’. Terms based on ‘nectar’, illustrated in (27), are found in only 3 languages with certainty, even though the substance was consumed over large swathes of the continent. Most likely the typical consumption in water is what prevents any more frequent link with the crystalline substance of sugar.[7] In fact, terms for ‘nectar’ appear to be extended more commonly to alcohol, as in (28), possibly reflecting the traditional practice of lightly fermented drinks based on nectar or gum (as also reported in Nash 1998; see further Clarke 2007: 105-106, Brady 2008). Terms based on ‘gum’ and ‘lerp’ for sugar, illustrated in (29) and (30), are equally rare, even though lerp has a structure that is more similar to sugar than any of the other traditional sweet foods. Two languages use a term that is based on an introduced species, viz. sugarcane, as in (31) below.

(27) Wangkajunga (Pama-Nyungan > Wati; Jones 2011)
jankawilarri ‘nectar, sugar’

(28) Manyjiljarra (Pama-Nyungan > Wati; Burgman 2009)
wama ‘1 nectar, from wild flowers, 2 tobacco, 3 alcoholic drinks’

(29) Adnyamathanha (Pama-Nyungan > Thura-Yura; McEntee & McKenzie 1992)
yumburra nguri ‘1 gum from *M.* [*Myoporum*] *platycarpum*, 2 sugar (raw or brown)’

[6] In some instances terms translated as ‘honey’ actually refer to nectar, as in Ngarrindjeri *pindjatjawi* ‘honey, sugar’: Ngarrindjeri is beyond the ‘sugarbag zone’, and the relevant ethnographic literature clearly confirms that *honey* actually refers to nectar not processed by bees (Berndt, Berndt & Stanton 1993: 571).

[7] Compare also Yandruwandha *ngapa patjikini* ‘sugar’, analysed in Breen (2004: 166) as “*ngapa* ‘water’, *patji* ‘good’, *-ka* ‘causative’, literally something like ‘water-improver’”.

[*yumburra* ‘false sandalwood, *Myoporum platycarpum*’; *nguri* ‘1 silver wattle, *Acacia rivalis*, 2 gum’]

(30) Nyungar (Pama-Nyungan > Nyungar; Bindon & Chadwick 1992)
dangoolyeneen ‘sugar’
[probably related to *dãng-yl* ‘plant, manna, so called?; white, sweet substance found under trees’]

(31) Kuku Yalanji (Pama-Nyungan > Northern > ?; Hershberger & Hershberger 1986)
bungku-jaba ‘sugarcane, or sugar. The knots of sugarcane appear as knees. This is not used much any more.’
[*bungku* ‘knee’; *jaba* ‘stick’]

4.2. Other extensions

Apart from traditional sources of sweetness, two further types of semantic extension are a very common pattern based on terms for ‘sand’ (highlighting texture just like the most common extension for ‘flour’ terms), and a less common one based on terms for ‘sweetness’.

Extensions based on ‘sand’ are found all over the continent, including in the ‘sugarbag’ zone, as illustrated in (32) and (33), which as already mentioned suggests that the crystalline texture of sugar was a feature that stood out. In some instances the ‘sugar’ reading requires a plant food generic, as illustrated in (34), while in others the link with ‘sand’ is only indirect, with an avoidance register term that covers both ‘sand’ and ‘sugar’, as in (35).

(32) Mawng (Iwaidjan; Hewett et al. 2013)
ajput ‘1 sand, beach, 2 sugar’

(33) Dalabon (Gunwinyguan; Evans, Merlan & Tukumba 2004)
radjdja ‘1 sand, 2 sugar’

(34) Umpithamu (Pama-Nyungan > Middle Paman; Verstraete 2020)
mayi nani
plant.food sand
‘sugar’

(35) Bininj Kunwok (Gunwinyguan; Evans 2003)
kun-karnalanj ‘sugar (avoidance register)’
[covers both *kun-kawadj* 'sand' and *djukka* 'sugar' (Evans 2003: 65)]

A far less common pattern is based on a general term for ‘sweetness’, as in (36) below. In a few cases this appears to be metonymically interlinked with a term for tea, as in (37) – a concrete reflection of the historical association between sugar and tea in the economy of the British empire as described by Mintz (1985).

(36) Wathawurrung (Pama-Nyungan > Macro-Kulin; Blake et al. 1998)
kep-kep ‘sugar, sweet’

(37) Bandjalang (Pama-Nyungan > Bandjalangic; Sharpe 2013)
gadjalgahny ‘sugar, tea’
[probably related to *gadjal* ‘sweet’]

4.3. Loans

Loans from English are almost as frequent in the data set as terms based on ‘sand’: all are based on English *sugar*, in one case further extended to cover sweet substances in general, as shown in (38). The form of the loans is as could be expected given the relative rarity of fricative phonemes, with the initial consonant most typically shifted to a palatal plosive as in (38), or very rarely a dental plosive as in (39).

(38) Pitjantjatjara (Pama-Nyungan > Wati: Goddard 1996)
tjuka ‘1 sugar, 2 sweet substances’

(39) Gamilaraay (Pama-Nyungan > Central NSW; Ash et al. 2003)
dhuga ‘sugar’

In Bilinarra and Gurindji, the loan *juga* is homophonous with the kinterm *juga* ‘child of a woman’, which according to Meakins (2013) and Meakins et al. (2013) has led to analogical extension of other terms for ‘child of a woman’ to ‘sugar’.

Beyond English, there is a minor pattern of loans from Malay in the northwest of the continent. O’Grady (1960) identifies the Nyangumarta term in (40) as a loan from Malay *gula* ‘sugar’. The same term is found in Karajarri, with a similar attribution to a Malay source (McKelson 1989), and in Yawuru (Hosokawa 1988), without attribution.

(40) Nyangumarta (Pama-Nyungan > Marrngu; O’Grady 1960)
kula ‘sugar, sweet’

Contact with Malay in this region probably originates in the pearling industry of the late 19th century, which operated out of Broome just north of Karajarri country and employed Malay workers (Reynolds 2003, Ganter 2006). There are claims about earlier, pre-European, contacts with Asian traders on Karajarri country (Skyring & Yu 2008), but it is unclear if these can be substantiated.

5. Tea

Table 3 summarises the patterns in terms for 'tea', and Figure 4 maps them out over the continent (excluding English loans and very minor patterns). The data includes terms referring to tea leaves, to brewed tea, and to both, but in many cases the sources do not allow us to decide what the precise reference is. Most patterns discussed in this section apply to both types of referents, but if there is any indication that a pattern is specific either to leaves or to the drink, this is mentioned.

Table 3 here

Figure 4 here

It is obvious from Table 3 that there are more and generally smaller patterns for 'tea' than for 'flour' and 'sugar', and that the proportion of terms based on traditional equivalents is extremely small. Section 5.1 discusses the relative rarity of traditional infused drinks, which explains the small proportion of traditional terms extended to 'tea'. Section 5.2 discusses other extensions, both the majority pattern based on leaves and other plant matter, and the smaller patterns based on various perceptual properties. Section 5.3 discusses loans, mostly based on English but also a smaller areal pattern that appears to originate in a loan of a term for a traditionally infused plant.

5.1. Traditional drinks

There is little evidence for traditional infusions prepared by boiling plants, except in medicinal contexts. The best-documented 'prepared' drink appears to be water sweetened by soaking sugarbag, nectar or gum in it: there is one instance of a term for this type of drink that

has been extended to tea, as discussed in section 5.2 below (example (50)). In some instances these drinks were slightly fermented to produce an intoxicating variant (see further in section 4.1 above for references); Clarke (2007: 105-106) also mentions four instances of intoxicating drinks made by infusing roots, bark or fruit of particular trees (see also Brady 2008). Apart from that, the main use of plant infusions appears to have been medicinal, often for external use (rubbing or rinsing) but sometimes also to be ingested, for instance as a tonic or a cough medicine (see Clarke 2007: 101-104).

Given the relative absence of plant infusions in traditional food culture, the small number of terms for 'tea' that appear to be based on traditional plants is not so surprising. There are 6 instances in the data set, typically glossed as 'bush tea' or 'wild tea', and often with a specific identification of a plant. It is not clear that the use of 'bush' in the gloss always refers to traditional use: the term in (41) below, for instance, is elsewhere described as "the name of a herbaceous plant growing at the water's edge in waterholes, and called by the whites 'pennyroyal' or 'tea bush' (because a drink was brewed with it), and extended to mean 'tea'" (Breen 2004: 166), which suggests it could be a 'bush' infusion used by Europeans.

(41) Yandruwandha (Pama-Nyungan > Karnic; Breen 2004)
kuntha '1 pennyroyal (*Mentha australis*, a strong-smelling plant that grows on the edge of waterholes), 2 tea'

Still, there is at least one term with some indication for an origin in a traditional infusion. The term in (42) below may be related to *tjaniwiri* 'rough heliotrope, *Heliotropium asperrimum*', which is described in an example as a source for a traditional drink: "[If you] should become overheated, *Heliotropium* might be [something] cool [for you]. You might macerate [its leaves] in a water-container and drink them with water. It is like a soft drink." (Peile 1993).

(42) Kukatja (Pama-Nyungan > Wati; Peile 1993)
tjaningu 'tea'

One further relevant example is discussed in section 5.3, in an areal pattern of *nalija* terms which has been argued to originate in a plant used for infusions.

5.2. Other extensions

The near-absence of traditional equivalents may have opened the way for a wide range of other patterns of extension, based on terms for ingredients or on the sensory experience of the drink – the latter to a greater degree than any of the other concepts studied.

The most common pattern is based on terms for 'leaf', highlighting the shape of the most prominent ingredient in the drink. In many instances the reference appears to be restricted to tea leaves rather than the brewed drink, as in (43) and (44) below. In others, however, the precise reference cannot be determined, and there is at least one instance with positive evidence for the 'drink' reference, with a contrast in generic determining the difference in reference, as illustrated in (45).

(43) Nyikina (Nyulnyulan; Hattersley 2014)
warnjal 'leaves, tea leaves'

(44) Urradhi (Pama-Nyungan > Northern Paman; Crowley 1993)
anyan-yampa
grass.generic-leaf
'tea leaves'

(45) Umpithamu (Pama-Nyungan > Middle Paman; Verstraete 2020)

mayi	akil	ngoki	akil
plant.food	leaf	water	leaf
'tea leaves'		'tea'	

Two minor patterns that may relate to leaves as an ingredient are extensions of terms for 'rubbish' plant matter and for 'grass'. The first one is probably based on the 'loose' nature of tea leaves, as in (46), and/or the way they look when they have been used, as in (47). The pattern based on 'grass', illustrated in (48), may also refer to the 'loose' nature of the leaves.

(46) Ngaanyatjarra (Pama-Nyungan > Wati; Glass & Hackett 2003)
yulypu '1 dry vegetable matter (sticks, grass, leaves), husks, 2 tea-leaves'

(47) Ngaanyatjarra (Pama-Nyungan > Wati; Glass & Hackett 2003)
kiilimpi '1 tea-leaves, 2 high-water mark'

(48) Baagandji (Pama-Nyungan > Northwest NSW; Hercus 1993)
gulda-gulda 'tea, i.e. 'grass''
[*gulda* 'grass, green ground vegetation in general']

Terms for the second ingredient of tea, water, are far less commonly extended to 'tea'. There is a small areal pattern in southwestern Cape York (covering Southwest Paman and Middle Paman languages) where a combination of 'water' with the plant food classifier refers to tea, as illustrated in (49) and (50) below. The pattern of polysemy for (50) suggests, once again, that sugarbag soaked in water is the most typical traditional 'prepared' drink.

(49) Koko-Bera (Pama-Nyungan > Southwest Paman; Edwards & Black 1998)
ma-yvnggáy 'tea (= water-food)'

(50) Yir Yoront (Pama-Nyungan > Southwest Paman; Alpher 1991)
may-kawn
veg.food-water
'1 watered juice of sugarbag, 2 tea, 3 beer'

Apart from ingredients, most other minor patterns of semantic extension are based on terms for various aspects of the sensory experience of the drink. There are terms based on the dark colour of the drink and the leaves, as in (51), on its temperature, as in (52), and on its flavour before and after sweetening, as in (53) below and (37) above.

(51) Ngaanyatjarra (Pama-Nyungan > Wati; Glass & Hackett 2003)
maru '1 black, dark, 2 tea (drink, or dry leaves), 3 Aboriginal person, black person from other countries'

(52) Kalaw Kawaw Ya (Pama-Nyungan > Northern > ?; Ober & Kennedy 1992)
komalnguki '1 hot water, 2 tea, coffee, 3 spirits, wine, whisky, alcohol'
[*komal* 'hot'; *nguki* 'water']

(53) Kaytetye (Pama-Nyungan > Arandic; Turpin & Ross 2011)
tyekerte '1 salty, bitter, sour, bad taste, 2 tobacco [respect language], 3 strong tea'

5.3. Loans

The majority of loans are based on English *tea* and related expressions like *tea leaf, cup of tea* or even *Chinese tea*, as in (54)-(57) below. There is one instance of a loan based on *coffee*, as in (58); there are no loans based on *chai* (like *tea* ultimately originating in a Sinitic language, but borrowed via Portuguese and spread through Portuguese trade routes; Dahl 2013).

(54) Burarra (Maningrida; Green 1987)
di ‘tea’

(55) Kayardild (Tangkic; Evans 1992)
dilibi ‘tea, i.e. tea leaves’

(56) Anindilyakwa (Gunwinyguan; Van Egmond 2012)
kapiti ‘tea’

(57) Ngan’gityemerri (Southern Daly; Reid & McTaggart 2008)
tyaniti ‘tea without sugar; probably a loanword from English based on 'Chinese tea'’

(58) Djambarrpuyngu (Pama-Nyungan > Yolngu; Wilkinson 1991)
gopi ‘tea, coffee’

The major phonological adaptations observed are a shift from an initial alveolar plosive to a dental or palatal equivalent, as in (59) and (60) – phonotactically more common as an initial (Baker 2014) – and various mechanisms related to typical word minimality constraints that require more than a single light syllable (Baker 2014). These include syllable breaking with a semivowel, as in (61), or various morphological mechanisms like reduplication and apparent incrementation, as in (62) and (63).[8] From this perspective, loans of longer terms based on *tealeaf* or *cup of tea* may also be formally motivated rather than (just) semantically, because they result in bi- or trisyllabic forms rather than monosyllables.

(59) Kalkatungu (Pama-Nyungan > Kalkatungic; Blake 1990)
thii ‘tea’

(60) Wirangu (Pama-Nyungan > Thura-Yura; Hercus n.d.)
dyii ‘tea’

(61) Nhanda (Pama-Nyungan > Kartu; Blevins 2001)
tiyi ‘tea’

(62) Arabana (Pama-Nyungan > Karnic; Hercus 1994)
thithi ‘tea’

(63) Wiradjuri (Pama-Nyungan > Central NSW; Wiradjuri Condobolin Corporation 2010)
dyiri, dyirang ‘tea’

[8] Depending on how the vowel is borrowed, vowel length may be sufficient to satisfy minimality requirements.

In addition to English-based loans, there is an areal pattern of languages in the northwest of the continent that use a term *nalija* for ‘tea’, as illustrated in (64) and (65). The diversity of genetic units involved (Ngumpin-Yapa and Wati within Pama-Nyungan, as well as Bunuban, Jarrakan,[9] Worrorran and Mindi languages) suggests a scenario originating in a loan. McConvell (2009, 2010) suggests an origin in Jaminjung or Karranga. Interestingly, the reference of the Karranga term includes a tree bark infusion, as shown in (66), which may make it a further example of a traditional infusion extended to cover ‘tea’.

(64) Gurindji (Pama-Nyungan > Ngumpin-Yapa; Meakins et al. 2013)
nalija ‘tea’

(65) Wangkajunga (Pama-Nyungan > Wati; Jones 2011)
nalija ‘tea’

(66) Karranga (Pama-Nyungan > Ngumpin-Yapa; McConvell 2010)
nalija ‘algae, tree bark infusion, tea’

6. Tobacco

Table 4 summarises patterns for ‘tobacco’ terms in the sample, and Figure 5 plots them on a map (excluding English-based loans and very minor patterns). The data covers any term referring to European tobacco: tobacco in general, specific types like chewing versus smoking tobacco or loose versus block tobacco, as well as cigarettes (but not smoking implements such as pipes). Again, if a pattern is specific to any particular type, this is explicitly mentioned.

Table 4 here

Figure 5 here

As with terms for ‘tea’, there are many small patterns in the data, but terms derived from native tobacco appear to be more common. Section 6.1 discusses terms derived from traditional equivalents, covering mainly plant types used for chewing but also a few terms

[9] All forms from Jarrakan languages have a final consonant. Given the geographic proximity we assume they belong to the *nalija*-pattern, though Kofod (1978: 7) proposes an alternative etymology for the Miriwoong form *nalidjan*, based on the verb stem *-nalu-* ‘to cook’.

apparently referring to stages in the preparation of native tobacco. Section 6.2 discusses other patterns of extension, the most common one based on terms for 'smoke' (and a related pattern derived from terms for inhaling or blowing); further patterns are based on terms highlighting the shape of tobacco leaves and the structure of processed tobacco, as well as terms relating to effects of tobacco consumption, and its flavour. Section 6.3 discusses loans, with the obvious English loans reflecting European introduction of tobacco, as well as a pattern of 'Macassan' loans that most likely reflect pre-European introduction of tobacco.

6.1. Traditional tobacco

Traditional equivalents of tobacco were widespread in Australia. Dried leaves of plants containing nicotine or other active substances were used as a stimulant in many parts of the continent: this includes the well-known case of pituri (*Duboisia hopwoodii*), as well as various types of 'native tobaccos' (see Clarke 2007: 106-110 for relevant plants, and Brady & Paradies 2005: 159 for a map of the distribution of plants and related trade routes). The leaves were mixed with specific types of ashes into a 'wad' (to enhance the release of nicotine and produce more juice, see Brady 2002, Clarke 2007: 107), and consumed by chewing. Non-native tobacco and smoking pipes were first introduced by Macassan traders in the Top End, and pipes were introduced across the Torres Strait to Cape York Peninsula from an unknown source (Brady 2002).[10] Smoking was used not just for introduced tobacco, but also extended to some types of native tobacco (Thomson 1939).

Traditional tobacco terminology is often quite extensive, with terms for specific plants and types of ash, as well as different stages of tobacco preparation and the resulting 'wad'. Most relevant terms based on traditional equivalents are based on plant types, as illustrated in (67) and (68) below, or stages in the preparation of tobacco, e.g. without ashes as in (69) or with ashes and ready for consumption as in (70). The glosses of the last two cases do not as such suggest traditional tobacco, but preparation with ashes is a practice mainly associated with native tobaccos (even though it has also been documented for 'European' tobacco, see Clarke 2007: 108-109).

(67) Ngaanyatjarra (Pama-Nyungan > Wati; Glass & Hackett 2003)

[10] See Brady (2013) for some doubts about the Macassan origins of smoking pipes in the Top End.

mingkurl(pa) ‘1 wild tobacco with large leaves: *Nicotiana* sp., 2 commercial tobacco’

(68) Wik Ngathan (Pama-Nyungan > Middle Paman; Sutton 1995)
keen ‘tobacco’
[referent of a cognate form in Wik Mungkan identified as *Grewia polygama* in Thomson (1939: 83), traditionally used as an equivalent of tobacco]

(69) Thalanyji (Pama-Nyungan > Kanyara-Mantharta; Austin 1992)
wanka ‘1a. alive, 1b. raw, 2. tobacco’

(70) Nyulnyul (Nyulnyulan; McGregor 2011)
muurl-jun ‘cooked, chewing tobacco’
[compare *muurl* ‘cooked, ripe’]

There are also a number of apparent areal patterns in terms derived from traditional equivalents. For instance, there is a set of tobacco terms with a shape *purlku* or *pulku* in and around the Pilbara region (covering Ngayarta, Kanyara-Mantharta and Marrngu languages), as illustrated in (71): none of these refer to native tobacco, but related forms in the terminology for native tobacco suggest that they may originate in a term for a ‘wad’ of native tobacco mixed with ashes, as suggested by the Burduna term in (72).

(71) Nyangumarta (Pama-Nyungan > Marrngu; Geytenbeek 2008)
purlku ‘chewing tobacco; in contrast to jangu, smoking tobacco’

(72) Burduna (Pama-Nyungan > Kanyara-Mantharta; Burgman 2007)
burlgu ‘native tobacco. a mixture of ashes from the bark of a particular tree and tobacco. it is chewed for its slightly narcotic effect’

Similarly, there is a set of 12 terms like *ngamari*, *ngamarri* or *ngamayi* covering a fairly large part of Western Australia, from Nyungar in the south, as in (73), to Nyulnyul in the north, as in (74). While 11 of these terms only refer to European tobacco, there is a similar Burduna term for native tobacco, shown in (75), which together with the polysemy in the Nyungar term suggests a scenario whereby a native tobacco term was extended to the new product and then borrowed northwards.

(73) Nyungar (Pama-Nyungan > Nyungar; Douglas 1976)
ngamari ‘native tobacco, cigarettes, tobacco’

(74) Nyulnyul (Nyulnyulan; McGregor 2011)

ngamarri ‘tobacco’

(75) Burduna (Pama-Nyungan > Kanyara-Mantharta; Burgman 2007)
ngamarin ‘native tobacco’

The same may apply to a set of forms like *ngunyju*, found in 13 languages of the Kimberley region and adjacent parts of the Northern Territory. Most of these forms only refer to European tobacco, but there is at least one instance where it also refers to a type of native tobacco, which may suggest a similar scenario.

6.2. Other semantic extensions

The only relatively common type of semantic extension in the data is based on terms for ‘smoke’, ‘steam’ or ‘fog’, i.e. highlighting consumption by smoking, as in (76) and (77) below.[11] In some cases the link is indirect, with a more abstract form from the avoidance register covering both tobacco and smoke, as in (78) (with the appropriate distinct generic terms).

(76) Flinders Island Language (Pama-Nyungan > Paman; Sutton 2017)
worrey ‘1 smoke, 2 tobacco’

(77) Bandjalang (Pama-Nyungan > Bandjalangic; Sharpe 2013)
juhm ‘smoke, steam, cigarette, tobacco, fog, mist’

(78) Dyirbal (Pama-Nyungan > Northern > ?; Dixon 1972)
garmban ‘smoke, haze, mist, steam (generic *bala*); tobacco (generic *balam*)’

Also related to consumption by smoking is a smaller pattern based on terms for ‘inhaling’ or ‘blowing’, as in (79) and (80). These are usually morphologically complex involving some kind of nominalisation, as illustrated in (79).

(79) Dhanggati (Pama-Nyungan > Yuin-Kuri; Lissarrague 2007)
bumbi-ti-kal
blow-INTR-NLZ

[11] This could also have been reinforced by the use of English *smoke* for ‘cigarette’ (see also 6.3 below for a relevant loan), resulting in a potential semantic calque.

‘smoke, tobacco’

(80) Wambaya (Mindi; Nordlinger 1993)
burlinjana ‘cigarette, pipe’
[compare *burlinja* ‘to smoke’]

Other patterns of extension are all fairly limited, with no more than a handful of instances each. One set relates to the shape and structure of tobacco: either the shape of unprocessed tobacco leaves or, in a set of specialised terms, the structure of different types of processed tobacco. Extensions based on terms for ‘leaf’ or ‘bark’ are illustrated in (81) and (82), and extensions based on the structure of loose tobacco as opposed to plug tobacco are illustrated in (83), (84) and (85) (the last one obviously also based on a term for ‘smoke’).

(81) Yidiny (Pama-Nyungan > Northern > ?; Dixon 1991)
marramarra ‘(lit. leaves) tobacco’

(82) Nyawaygi (Pama-Nyungan > Northern > ?; Dixon 1983)
yungga ‘bark, skin, tobacco’

(83) Yindjibarndi (Pama-Nyungan > Ngayarta; Anderson 1991)
janjirn ‘curls, bark; stick decorated with bark curls; tobacco, poor’

(84) Dalabon (Gunwinyguan; Evans, Merlan & Tukumba 2004)
berrû-no ‘1 chest, 2 chest-meat, brisket, 3 front of, 4 (with locative suffix and appropriate pronominal suffix) in front of, 5 tobacco; block tobacco with a mark in the middle. Said to be 'flat like (a) chest'’

(85) Guugu Yimithirr (Pama-Nyungan > Northern > ?; Haviland nd)
ngalgal burrburr ‘chewing tobacco’, ngalgal buluurr ‘loose tobacco’
[*ngalgal* ‘smoke’; *burrburr* ‘hard, solid, unbroken, correct pronunciation’; *minha buluurr* ‘mince [meat]’]

Possibly related to shape-based patterns is a small areal pattern of terms for ‘tree’ or ‘stick’ exended to tobacco in the southwest of Cape York Peninsula (covering Southwest Paman, Middle Paman and Alaya-Athima languages), as in (86) and (87). There is only one instance of a ‘cigarette’ reference in this set, so it is not clear if shape is actually the feature that matters here.

(86) Ogunjan (Pama-Nyungan > Alaya-Athima; Alpher n.d.)

ek ‘1 tree, 2 stick, 3 tobacco’

(87) Pakanh (Pama-Nyungan > Middle Paman; Hamilton 1997)
yuku ‘1 tree (generic classifier for trees and plants, particularly those which are not edible), 2 generic classifier for many insects, including ants and spiders, 3 tree, plant, 4 wood, 5 cigarette’

A second set of patterns relates to the effects of tobacco: there is one term based on ‘vomit’, illustrated in (88), and a set of terms from a number of Wati languages (and one neighbour) that also cover stimulants like alcohol (and are ultimately based on ‘nectar’, see section 4.1 above on this link), as illustrated in (89).

(88) Kaurna (Pama-Nyungan > Thura-Yura; Amery & Simpson 1994)
kappi ‘tobacco. From kappendi ‘to vomit’’

(89) Kukatja (Pama-Nyungan > Wati; Peile 1993)
wama ‘nectar (e.g. of native fuchsia); any delicacy; any sweet bush tucker; beer; wine; chewing tobacco’

Finally, there are two terms based on strong flavour, one of which is illustrated in (90), and a small areal pattern around the Daly River of terms based on ‘shit’ (including Southern Daly, Eastern Daly and Western Daly languages), as illustrated in (91) and (92).

(90) Jingulu (Mindi; Pensalfini 2011)
mijuwulmi ‘tobacco (ancient word)’
[compare *mijuwulyi* ‘salty, spicy, pungent’]

(91) Marrithiyel (Western Daly; Green 1989)
wiyan ‘shit=European tobacco’

(92) Matngele (Eastern Daly; Zandvoort 1999)
goen ‘tobacco, faeces’

6.3. Loans

Most loans from English are based on *tobacco*, but there are also loans based on *cigarette* or *ciggie*, *smoke*, and even *nicotine*, as illustrated in (93)-(95). *Tobacco*-derived forms are bisyllabic forms based on the last two syllables, as in (96) and (97), or trisyllabic forms, often

with a shift of initial plosive as in (98), from the phonotactically less common alveolar to a palatal.

(93) Warrgamay (Pama-Nyungan > Northern > ?; Dixon 1981)
dyiga ‘cigarette’

(94) Baagandji (Pama-Nyungan > Northwest NSW; Hercus 1993)
muugu ‘tobacco (from English 'smoke')’

(95) Ngan’gityemerri (Southern Daly; Reid & McTaggart 2008)
nugutin ‘tobacco plant, tobacco prepared for smoking. Loanword from English/Kriol ‘nicotine’’

(96) Kunbarlang (Gunwinyguan; Kapitonov 2019)
bakki ‘tobacco’

(97) Yandruwandha (Pama-Nyungan > Karnic; Breen 2004)
paka ‘tobacco’

(98) Yawuru (Nyulnyulan; Hosokawa 1988)
dyubaki ‘tobacco’

As with ‘flour’ terms, there is also a pattern of ‘Macassan’ loans in the north of Australia, which may reflect a pre-European introduction of tobacco in the region (see Brady 2002, 2013 on the role of tobacco in Macassan trade). Walker & Zorc (1981) first identified a Makassarese source *tambako*[12] (itself a loan from Portuguese) for Yolngu-Matha *dhambaku* ‘tobacco’, and Evans (1992) showed that such loans are more widespread across the Top End. In our data, similar forms are found in 17 languages: in the central and eastern part of the Top End, illustrated in (99) and (100), but also at the southern end of the Gulf of Carpentaria and adjacent inland areas, as in (101) and (102), as well as the south of Cape York Peninsula, as in (103). The forms beyond the Top End have the characteristic nasal-plosive combination *mp* found in Macassan loans, but vowel patterns are different, either with a final *i*, as in (102), or with a glide in the second syllable, as in (101) and (103). None of these forms are counted as Macassan loans in the literature (hence classification as ‘possible’ in Table 4 above), except for the Lardil form in (101), which is analysed as Macassan in origin by Evans (1992). For languages like Kalkatungu or Yir Yoront there is no evidence at all for Macassan contact, but

[12] As argued in Walker & Zorc (1981), there are similar forms in Buginese and Malay, which could also be relevant sources.

an indirect loan via a language with direct Macassan contact is not unlikely, given the geographic proximity and the nasal-plosive combination that is hard to explain in any other way.

(99) Ngalakgan (Gunwinyguan; Merlan 1983)
jambaku ‘tobacco’
(100) Rembarrnga (Gunwinyguan; Saulwick 2003)
dambakku ‘tobacco’
(101) Lardil (Tangkic; Hale et al. 1981)
dumbayiki ‘tobacco’
(102) Kalkatungu (Pama-Nyungan > Kalkatungic; Blake 1990)
thumpaki ‘tobacco’
(103) Yir Yoront (Pama-Nyungan > Southwest Paman; Alpher 1991)
thampayk ‘tobacco (as smoked)’

Apart from the English- and ‘Macassan’-based loans, the data also show a few areal patterns that most likely originate in ‘local’ loans, like the three patterns discussed in section 6.1 above.

7. Conclusion

To conclude, we summarise some of the patterns discussed in the previous sections. One clear pattern is that extensions of terms for traditional equivalents are relatively rare, at least for flour, sugar and tea. In the case of tea there simply is no obvious widespread equivalent in traditional food culture: apart from a few intoxicating drinks based on plant parts, plant infusions are mostly medicinal. For flour and sugar there are traditional equivalents, but these are usually quite different in texture (and most likely also flavour, as well as prestige in the case of sugarbag), which may have prevented more extensions of traditional terms. The importance of texture differences is actually supported by the existence of a major texture-based pattern for both products (based on terms for ‘dust’ and ‘sand’ respectively). In the case of flour, moreover, terms based on traditional equivalents are in large part products of starch extraction, which is generally more similar in texture (and colour) to European flour than the product of seed-grinding. For all three products, the relative rarity of terms based on traditional equivalents may also be due to the fact that traditional and introduced products

continued to be consumed side by side, which may have required a more distinctive term for the introduced one. Tobacco is a bit different from the rest, because there are more extensions of traditional terms, as discussed in section 6.1. The reason may be that of the four products, this is probably most similar to traditional equivalents: not just in terms of its basic shape and structure (at least for the native tobaccos, less so for pituri), but also due to significant crossovers in the way they are prepared and used, with smoking extended to native tobaccos, and European tobacco mixed with ashes for chewing. It is hard to actually demonstrate the importance of such usage factors with the data we have available, but classic studies of semantic fields (like Labov 1973) have shown that usage and contextual factors can play an important role in lexical contrasts.

A second set of patterns in the data concerns the semantic features that are highlighted in other types of extension, which may give an idea of how the products were initially perceived. As already mentioned, the majority patterns for flour and sugar highlight texture, with terms based on 'dust' and 'sand' respectively. The majority pattern for tea is somewhat similar, in that it highlights the shape of the basic ingredient, with terms based on 'leaf'. For tobacco, by contrast, texture and shape are not particularly important: there is only a small set of general terms based on 'leaf', and a small set of specialised terms based on the structure of processed tobaccos. Instead, the majority pattern seems to highlight the 'new' mode of consumption, with terms based on 'smoke', 'inhale' and 'blow'. Processing and consumption are rare, or even absent, as semantic features for flour, sugar and tea: there is a small set of terms that seems to be based on the appearance of 'used' tea, as well as a small set of terms based on the baking process for flour. Somewhat surprisingly for the domain of food and drink, the feature of flavour is very rare for all four products, with only a handful of relevant terms (based on 'sweet' for sugar, 'bitter' and 'sweet' for tea and 'pungent' for tobacco). This is quite different from the results of Nash (1998), who shows that flavour is an important feature in words for alcohol, with quite a few terms that are based on flavour terms like 'salty' or 'bitter' as well as 'sweet' (the latter possibly related to 'honey' or 'nectar' as the basis for intoxicating drinks, see also section 4.1). Other perception-based features are equally rare in the data set: apart from colour-based terms for flour (whiteness may have stood out just like the fine texture), there are only very minor patterns for colour (some terms for tea based on 'dark') and temperature (some terms for tea based on 'hot'). It is not clear how specific this particular configuration of features is from a broader typological perspective, but there are two points of comparison that give some idea. Brown's (1999) large-scale study of introduced concepts in the Americas includes flour, sugar and tea. While he notes instances of 'dust' and

'leaf' for flour and tea (1999: 32, 49), sugar is mostly related to 'sweet' and there is no strong evidence for a texture-based extension (except perhaps indirectly in a small pattern based on 'sweet salt', 1999: 146). Similarly, patterns of colexification documented in the CLICS database (Rzymski et al. 2019) suggest links with 'dust' and 'smoke' or 'leaf' for flour and tobacco, but again only a link with 'sweet' for sugar. In other words, texture- or shape-based features seem to be more generally dominant in the Australian case, at least as compared with features relating to flavour.

A third set of patterns concerns areal patterning in the data. Some areal patterns are based on loans from beyond Australia: Malay loans for sugar around Broome, and 'Macassan' loans for flour and tobacco in the Top End, with possible indirect spread of tobacco terms to the southern Gulf of Carpentaria and adjacent areas to the south and east. Others seem to be based on local loans that spread in their immediate region, especially in the west of the continent, like *yurndura* terms for flour, *nalija* terms for tea, and various terms for tobacco discussed in section 6.1. We also reported some semantically based areal patterns. The majority patterns for flour, sugar, tea and tobacco seem to be widespread across the continent, but some smaller patterns are more local, for instance terms based on 'water-food' for tea and 'stick' for tobacco in the southwest of Cape York Peninsula, and terms based on 'shit' for tobacco in the Daly River region. The existence of such areal patterns suggests that not all types of extension have an independent semantic motivation, but may simply travel along with cultural innovations, in the same way that has been suggested for Wanderwörter (see Haynie et al. 2014). We have not been able to discuss patterning of loans from English in any detail, but it is quite clear from the data that there is no simple gradient (e.g. from southeast to north) reflecting the timing of the introduction of English and English-based contact varieties. As already mentioned in section 2.2, the proportion of English-based terms is really dependent on the nature of the source used, with 'layering' effects reflecting generations of consultants and timing and degrees of contact with English or English-based contact languages. None of this information can easily be aggregated at the language level in our data: analysing this in any serious way would require annotating relevant features for each individual source and even for each individual consultant represented in the source, which is far beyond the scope of this study.

Acknowledgements

Authorship is shared equally. JCV conceived the study. VH first excerpted terms for ‘flour, ‘sugar’ and ‘tea’ in 105 languages, and VH and JCV jointly analysed these, leading to Hoogmartens (2018). JCV then added a further 92 languages to the database for ‘flour’, ‘sugar’ and ‘tea’, revised some of the earlier analyses, and excerpted and analysed terms for ‘tobacco’ in the full set of languages. JCV wrote the text. We thank Aung Si, James Bednall, Alan Dench, Dana Louagie, David Nash and Peter Sutton for help with sources, data and/or comments. We also thank two anonymous reviewers for very helpful comments on an earlier version of the manuscript. Work on this paper was funded by the Research Council of the University of Leuven (grant C14/18/034).

Disclosure statement:

No potential conflict of interest was reported by the authors.

References [References to sources for the sample languages can be found in Appendix 1 and Appendix 2]

Baker, Brett. (2014). Word structure in Australian languages. In Harold Koch & Rachel Nordlinger (Eds.) *The languages and linguistics of Australia* (pp. 139-213). de Gruyter Mouton.

Berndt, Ronald, & Berndt, Catherine Berndt (with Stanton, John). (1993). *A world that was. The Yaraldi of the Murray River and the Lakes, South Australia*. University of British Columbia Press.

Bowern, Claire. (2012). *Master list of Australian languages, v 1.2*. https://pamanyungan.sites.yale.edu/master-list-australian-languages-v12.

Bowern, Claire, & Atkinson, Quentin. (2012). Computational phylogenetics and the internal structure of Pama-Nyungan. *Language* 88, 817-845.

Brady, Maggie. (2002). Historical and cultural roots of tobacco use among Aboriginal and Torres Strait Islander people. *Australian and New Zealand Journal of Public Health* 26, 120-124.

Brady, Maggie. (2008). *First taste. How Indigenous Australians learned about grog*. Alcohol Education & Rehabilitation Foundation Ltd.

Brady, Maggie. (2013). Drug substances introduced by the Macassans: The mystery of the tobacco pipe. In Marshall Clark & Sally May (Eds.), *Macassan history and heritage: Journeys, encounters and influences* (pp. 141-157). Australian National University Press.

Brady, Maggie, & Paradies, Yin. (2005). Health and wellbeing. In Bill Arthur & Frances Morphy (Eds.), *Macquarie atlas of Indigenous Australia* (pp. 156-171). Macquarie Library.

Brock, Peggy. (2007). Nakedness and clothing in early encounters between Aboriginal people of Central Australia, missionaries and anthropologists. *Journal of Colonialism and Colonial History* 8.

Brock, Peggy. (2008). Two-way food: bush tucker and whitefella's food. *Journal of Australian Studies* 31, 19-32.

Brown, Cecil. (1999). *Lexical acculturation in Native American languages*. Oxford University Press.

Clark, Marshall, & May, Sally. 2013. Understanding the Macassans: A regional approach. In Marshall Clark & Sally May (Eds.), *Macassan history and heritage: Journeys, encounters and influences* (pp. 1-18). Australian National University Press.

Clarke, Philip. (2007). *Aboriginal people and their plants*. Rosenberg Publishing.

Dahl, Östen. (2013). Tea. In Matthew Dryer & Martin Haspelmath (Eds.), *The world atlas of language structures online*. Max Planck Institute for Evolutionary Anthropology. Available online at http://wals.info/chapter/138.

Davidson, Donald, & McCarthy, Fred. (1957). The distribution and chronology of some important types of stone Implements in Western Australia. *Anthropos* 52, 390-458.

Dixon, Robert. (2002). *Australian languages: Their nature and development*. Cambridge University Press.

Dollin, Anne, Dollin, Leslie, & Rasmussen, Claus (2015). Australian and New Guinean stingless bees of the genus *Austroplebeia* Moure (Hymenoptera: Apidae) – a revision. *Zootaxa* 4047, 1-73.

Evans, Nick. (1992). Macassan loanwords in top end languages. *Australian Journal of Linguistics* 12, 45-91.

Evans, Nick. (2003). Introduction: Comparative non-Pama-Nyungan and Australian historical linguistics. In Nick Evans (Ed.), *The non-Pama-Nyungan languages of northern Australia* (pp. 2-25). Pacific Linguistics.

Foster, Robert. (1989). Feasts of the full: The distribution of rations of Aborigines in South Australia: 1836-1861. *Aboriginal History* 13, 63-78.

Foster, Robert. (2000). Rations, coexistence and the colonisation of Aboriginal labour in the South Australian pastoral industry, 1860-1911. *Aboriginal History* 24, 1-26.

Ganter, Regina. (2006). *Mixed relations: Asian-Aboriginal contact in North Australia*. University of Western Australia Press.

Gracey, Michael. (2000). Historical, cultural, political, and social influences on dietary patterns and nutrition in Australian Aboriginal children. *American Journal of Clinical Nutrition* 72, 1361S-1367S.

Haynie, Hannah, Bowern, Claire, Epps, Pattie, Hill, Jane, & McConvell, Patrick. (2014). Wanderwörter in languages of the Americas and Australia. *Ampersand* 1, 1-18.

Heard, Tim. (2016). *The Australian native bee book*. Sugarbag Bees.

Hoogmartens, Vicky. (2018). *Flour, sugar, tea. Nieuwe woorden voor geïntroduceerde concepten in Australische talen* [unpublished MA thesis]. University of Leuven.

Isaacs, Jennifer. (2002). *Bush food. Aboriginal food and herbal medicine*. JB Books.

Jebb, Mary Anne. (2002). *Blood, sweat and welfare: A history of white bosses and Aboriginal pastoral workers*. University of Western Australia Press.

Kouris-Blazos, Antigone, & Wahlqvist, Mark. (2000). Indigenous Australian food culture on cattle stations prior to the 1960s and food intake of older Aborigines in a community studied in 1988. *Asia Pacific Journal of Clinical Nutrition* 9, 224-231.

Labov, William. (1973). The boundaries of words and their meanings. In Charles Bailey & Roger Shuy (Eds.), *New ways of analyzing variation in English* (pp. 340-373). Georgetown University Press.

Latz, Peter. (1995). *Bushfires & bushtucker. Aboriginal plant use in Central Australia*. IAD Press.

Lee, Amanda, & Ride, Kathy. (2018). Review of nutrition among Aboriginal and Torres Strait Islander people. *Australian Indigenous Health Bulletin* 18, 1-47.

Martinez, Julia. (2007). When wages were clothes: dressing down Aboriginal workers in Australia's Northern Territory. *International Review of Social History* 52, 271-286.

McConvell, Patrick. (2009). Gurindji vocabulary. In Martin Haspelmath & Uri Tadmor (Eds.),*World loanword database*. Max Planck Institute for Evolutionary Anthropology. Available online at http://wold.clld.org/vocabulary/31.

McConvell, Patrick. (2010.) Contact and indigenous languages in Australia. In Raymond Hickey (Ed.), *The handbook of language contact* (pp. 770-794). Blackwell.

McGrath, Anne (Ed.). 1995. *Contested ground: Australian Aborigines under the British crown*. Allen & Unwin.

McGregor, William. (2000). Cockatoos, chaining-horsemen and mud-eaters: Terms for 'policeman' in Australian Aboriginal languages. *Anthropos* 95, 3-22.

Mintz, Sydney. (1985). *Sweetness and power: The place of sugar in modern history*. Penguin.

Mitchell, Jessie. (2011). *In good faith? Governing indigenous Australia through god, charity and empire, 1825-1855*. Australian National University Press.

Nash, David. (1998). Grog terminology. In Maggie Brady, *The grog book: Strengthening indigenous community action on alcohol* (p. 211-215). Dept. of Health and Family Services.

Nash, David. (2020). Wheeled vehicle terminology in Australian languages. In Paul Monaghan & Michael Walsh (Eds.), *More than mere words: Essays on language and linguistics in honour of Peter Sutton* (pp. 214-234). Wakefield Press.

Nettelbeck, Amanda, & Foster, Robert. (2012). Food and governance on the frontiers of colonial Australia and Canada's North West Territories. *Aboriginal History* 36, 21-41.

Newland, Simpson. (1890). The Parkengees, or Aboriginal tribes on the Darling River. *Proceedings of the Royal Geographical Society of Australasia. South Australian Branch* 2, 20-32.

Reynolds, Henry. (2003). *North of Capricorn: The untold story of Australia's north*. Allen & Unwin.

Roth, Walter. (1901). *North Queensland ethnography. Bulletin no. 3. Food: its search, capture, and preparation*. Queensland Government Printer.

Rowse, Tim. (1998). *White flour, white power: From rations to citizenship in Central Australia*. Cambridge University Press.

Rzymski, Christoph, Tresoldi, Tiago, Greenhill, Simon, Wu, Mei-Shin, Schweikhard, Nathanael, Koptjevskaja-Tamm, Maria, Gast, Volker, Bodt, Timotheus, Hantgan, Abbie, Kaiping, Gereon, Chang, Sophie, Lai, Yunfan, Morozova, Natalia, Arjava, Heini, Hübler, Nataliia, Koile, Ezequiel, Pepper, Steve, Proos, Mariann, Van Epps, Briana, Blanco, Ingrid, Hundt, Carolin, Monakhov, Sergei, Pianykh, Kristina, Ramesh, Sallona, Gray, Russell, Forkel, Robert, & List, Johann-Mattis. (2019). The database of cross-linguistic colexifications, reproducible analysis of cross-linguistic polysemies. *Scientific Data* 7, 13.

Si, Aung, & Carew, Margaret. (2018). Stingless honeybee (sugarbag) naming, identification and conceptualization in Arnhem Land: A lexicographic approach. *Australian Journal of Linguistics* 38, 519-548.

Si, Aung, & Turpin, Myfany. (2015). The importance of insects in Australian Aboriginal society: A dictionary survey. *Ethnobiology Letters* 6, 175-182.

Simpson, Jane (2016). Working verbs: the spread of a loan word in Australian languages. In Peter Austin, Harold Koch & Jane Simpson (Eds.), *Language, land and song: Studies in honour of Luise Hercus* (pp. 244-262). EL Publishing.

Skyring, Fiona, & Yu, Sarah. (2008). 'Strange strangers': First contact between Europeans and Karajarri people on the Kimberley coast of Western Australia. In Peter Veth, Peter Sutton & Margo Neale (Eds.) *Strangers on the shore: Early coastal contacts in Australia* (pp. 60-75). National Museum of Australia.

Smith, Pamela. (2000). Station camps: legislation, labour relations and rations on pastoral leases in the Kimberley region, Western Australia. *Aboriginal History* 24, 75-97.

Thomson, Donald. (1939). Notes on the smoking pipes of North Queensland and the Northern Territory of Australia. *Man* 39, 81-91.

Tindale, Norman. (1974). *Aboriginal tribes of Australia: Their terrain, environmental controls, distribution, limits and proper names*. University of California Press.

Walker, Alan, & Zorc, David. (1981). Austronesian loanwords in Yolngu-Matha of northeast Arnhem Land. *Aboriginal History* 5, 109-134.

Walsh, Michael. (1992). A nagging problem in Australian lexical history. In Tom Dutton, Malcolm Ross & Darrell Tryon (Eds.), *The language game: Papers in memory of Donald C. Laycock* (pp. 507-519). Pacific Linguistics.