Antoinette Schapper[1]

Wallacea, a Linguistic Area

Introduction

"Wallacea" typically refers to a zoogeographical area constituting a transition zone between Sundaland (the Malay Peninsula, Sumatra, Borneo, Java, and Bali) and Sahul (Australia and New Guinea) (see Map 1, Dickerson 1928). Biological Wallacea includes Sulawesi, Lombok, Sumbawa, Flores, Sumba, Timor, Halmahera, Buru, Seram, and many smaller islands of eastern Indonesia and independent Timor-Leste (Map 2). Defined by its mixing of faunal types from the Southeast Asian and Australian areas, it is demarcated in the West by the Wallace Line and in the East by the Lydekker Line, and cross-cut by the Weber Line. Wallacea is well known as an area of mega-biodiversity with very high numbers of species found nowhere else in the world. For instance, it is home to over 10,000 plant species and more than 1,100 terrestrial vertebrate species, many endemic (Coates & Bishop 1997, Myers et al. 2000, Schulte et al. 2003).

What is less well known is that this tremendous species diversity correlates with a rich linguistic diversity.[3] In Wallacea the number of languages is much higher and average speaker population much lower than in western Indonesia (Florey 2005: 48-49). In Maluku alone there are approximately 130 languages, with speaker populations typically between several hundred and a thousand (Florey 2002: 258). In terms of language families, Wallacea is more diverse than the region to its west. Whilst the entirety of western Island Southeast Asian languages are Austronesian, the languages of Wallacea hail from over a dozen different language families, not only the large Austronesian family but also many smaller distinct Papuan, or non-Austronesian, families.[4] Structurally, the languages of Wallacea are recognised as particularly diverse (Greenhill & Gray 2005: 35). For example, amongst the Papuan languages we find different major word order profiles: SVO (Subject-Verb-Object) in Halmahera and the Bird's Head, and SOV (Subject-Object-Verb)[5] in Timor-Alor-Pantar, Bomberai Peninsula, the Bird's Neck and Yapen. Amongst the Austronesian languages, there is an array of morphological profiles ranging from highly isolating such as Kéo in Flores, to rich in derivational morphology such as Kambera in Sumba or inflectional such as Banda in Maluku.

Yet, until recently our understanding of the variety of languages within Wallacea was limited; our picture of many languages is based solely on rapidly elicited wordlists and sketchy example sentences (see, e.g., Collins 1982 on Maluku languages, or more recently, Hull 2005 on Makasae, Chlenov & Chlenova 2008 on Damar, Price & Donohue 2009 on Ansus) or early missionary grammars written with the categories of Latin and Greek grammar

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3. An increasing body of research has affirmed the link between biological and linguistic diversity, for instance, Harmon (1996), Harmon & Maffi (2002), Moore et al. (2002), Sutherland (2003), Maffi (2005), Gorenflo et al. (2012), including for the New Guinea area (Turvey & Pettorelli 2014, though see Marcel et al. 2015 for an alternative explanation of the apparent correlation).

4. "Papuan" does not refer to a single genetically cohesive group of languages. Rather it is a negative label that encompasses languages that are not members of the Austronesian language family *and* occur on or around the island of New Guinea. In much of the literature, emphasis is placed on "Papuan" languages not being part of the Austronesian family, and this has given rise to "non-Austronesian" as an alternative label to "Papuan." This label is not employed here, as it does not carry with it the geographic restriction to the area of New Guinea which is so crucial to "Papuanness." Austronesian languages are in fact in contact with members of multiple other (non-Papuan) language families, including Australian, Austro-Asiatic, Bantu, Tai-Kadai and Sino-Tibetan.

5. Following Dryer (2013d), I use the terms "subject" and "object" here in a non-technical sense: "The terms *subject* and *object* are used here in a rather informal semantic sense, to denote the more agent-like and more patient-like elements respectively. Their use here can be defined in terms of the notions S, A, and P, where the S is the single argument in an intransitive clause, the A is the more agent-like argument in a transitive clause, and the P is the more patient-like argument in a transitive clause. [...] the term *subject* is used for the A while the term *object* is used for the P. A language shown [...] as SOV could thus also be equally well and perhaps more accurately described as APV."

in mind (see, e.g., Geurtjens 1921, Maan 1951). Indeed, just a decade ago Tryon (1995: 12) wrote that the Wallacean region "perhaps remains the least known area in the Austronesian world today." A surge in the production of modern linguistic descriptions across the region has meant there have been significant advances in knowledge of the details of individual languages, both Austronesian and Papuan.

Modern syntheses of Wallacean languages have tended to focus at one and the same time on the diversity of morphosyntactic profiles they display (see, e.g., the papers in Ewing & Klamer, eds, 2010) and on their representing a progressive attenuation of the prototypical Austronesian linguistic profile towards a more Melanesian linguistic profile (see, e.g., Himmelmann 2005 for one statement of Austronesian characteristics with a "typical" Austronesian profile versus those with an "adjusted" Melanesian profile). In this paper, I argue for a more nuanced perspective on the languages of Wallacea. Rather than simply seeing Wallacean languages as diverse, I seek to show that despite the diversity there is a coherence to them, and that this coherence is not simply a matter of shared characteristics due to their being marginal Melanesian languages within a transitional zone between linguistic areas. Instead I propose that the languages of Wallacea display a distinct set of linguistic features that set them off both from the Southeast Asian Linguistic Area to the West (island Sunda) as well as the Melanesian Linguistic Area to the East (northern Sahul). The Wallacean Linguistic Area is focused further to the east than Biological Wallacea, consisting of Nusa Tenggara including Timor-Leste, Maluku, the Bird's Head and Neck of New Guinea, and Cenderawasih Bay (Map 3). The nature and dispersal of the features shared by Wallacean languages, I argue, points to the existence of networks of seafaring agriculturists predating the Austronesian presence inWallacea.

This paper is structured as follows. Section 2 looks at what a linguistic area is, what the features that best define it are, and what it tells us about the history of speech communities within it. Section 3 overviews the language scene within Wallacea. Section 4 contextualises Wallacea as the western-most region of Papuan linguistic influence within Island Southeast Asia. Section 5 presents the features that define not merely eastern Austronesian and Papuan in general, but specifically the Wallacean area. Section 6 looks at the prehistorical inferences that can be drawn from Linguistic Wallacea. Section 7 looks at the archaeological data and how it correlates with the linguistic data, pointing to Wallacea being a relic of an historical situation in which there were extensive pre-Autronesian interisland contacts and agriculture within Wallacea.

What is a Linguistic Area?

A *linguistic area* (or *convergence/diffusion area*, *Sprachbund*, *affinité linguistique*) is a geographical region in which a group of languages, typically
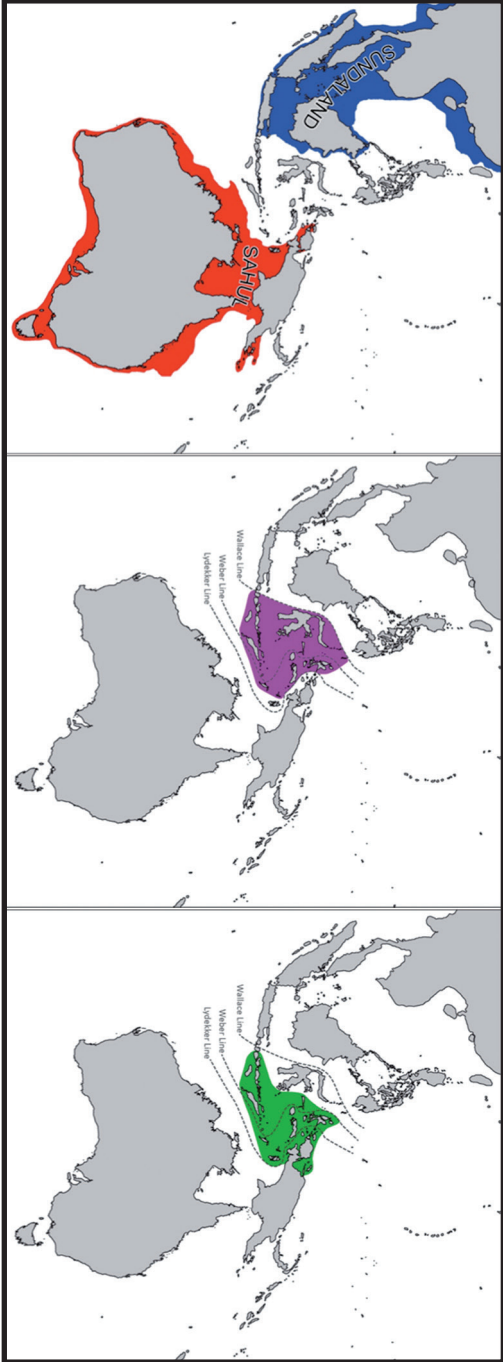
Map 1 – Sunda and Sahul Shelves.

The Wallace Line (Huxley 1868: 313) defines the westernmost extension of marsupials (Marsupialia) and the beginning of the zone of mixing between the Southeast Asian and Australian faunal regions.

Map 2 – Biological Wallacea.

The Lydekker Line (1896) defines the easternmost extension of Southeast Asian animals into the zone of mixing between the Southeast Asian and Australian faunal regions.

Map 3 – Linguistic Wallacea.

The Weber Line (1902) marks a supposed "faunal balance" between the Southeast Asian and the Australian faunal regions within Wallacea.

from different families, share a set of features in common not as a result of accident or inheritance from a common ancestor, but rather due to historical processes of language contact and convergence (Weinreich 1953, Thomason & Kaufman 1988: 91-97, Aikhenvald & Dixon 2001).

Since the first identification of the Balkans as an area in which significant copying from one language to another had occurred due to long-standing bi- and multilingualism between speaker groups (Sandfeld 1930), many linguistic areas have been identified around the world. Some of the most well-described and best known are: the South Asian Linguistic Area (Emeneau 1956, 1974, Masica 1976), the Ethiopian Linguistic Area (Leslau 1945, 1952, Hetzron 1975, Ferguson 1976, Tosco 2000), the Meso-American Linguistic Area (Campbell, Kaufman & Smith-Stark 1986, Campbell 1992, van der Auwera 1998), the "Standard Average" European Linguistic Area (Whorf 1956, Haspelmath 1998, 2001), and the Mainland Southeast Asian Linguistic Area (Clark 1992, Matisoff 2001, Enfield 2005).

With the discovery of more and more linguistic areas worldwide, the topic has generated a vast literature. In particular there is much debate about precisely what criteria must be fulfilled in order for the term *linguistic area* to be deployed justifiably (recent summaries of the problems include Dahl 2001, Thomason 2001, Stolz 2002, Campbell 2006). Nonetheless there is broad agreement about the features that establish a robust linguistic area. They are:

Distinctiveness. Accidental similarity between languages can occur where a feature is cross-linguistically widespread and sharing such a feature does not necessarily signal any kind of historical connection between languages. Worldwide some linguistic features are common, while others are rare. As such, a feature that frequently occurs outside of a linguistic area has lower distinctiveness and accordingly provides weaker evidence for a linguistic area. The rarer a feature is cross-linguistically the higher its distinctiveness and the greater its value in defining a linguistic area.

Consistency. Innovative linguistic features do not spread among the languages of a linguistic area evenly; some features spread farther than others, and if the feature originates in different places within the area there will inevitably be different patterns of spread. As such, not all languages within a linguistic area need exhibit all the features that are said to define the area. However, the higher the consistency with which languages in an area display a feature, the stronger the support for the area provided by that feature. Conversely, a feature displayed by a smaller proportion of languages in an area has lower consistency and provides weaker evidence for the area than do those of higher consistency.

Demarcation. Shared structural features that characterize a particular linguistic area do not have to be confined to the area. This is for two reasons. Firstly, a language may have a feature that is inherited from an earlier ancestral

language and this feature may be still present in its sister languages outside the area. In that case, the feature is obviously not confined to the linguistic area, but may be still used as diagnostic of the linguistic area as long as it can be shown to have spread widely from the first language(s) which had inherited the feature to other unrelated languages in the area. Secondly, speakers of some languages within a linguistic area are likely to have contacts beyond the boundaries of the area, and by that means there may be some restricted diffusion of the features to languages outside the area. So, the clearer the demarcation a feature shows within a linguistic area (that is the less leakage beyond the area), the stronger the support for the area provided by that feature.

Cross-familial presence. The languages in a linguistic area need not be unrelated. However, with related languages, distinguishing changes due to drift from changes due to contact may be very difficult. Where languages are unrelated, it is easier to establish which features are the result of borrowing and diffusion rather than inheritance. It follows that the more unrelated families a feature appears in, the clearer it is that the feature has diffused and the better it is as a diagnostic for area.

The Wallacean Language Scene

Wallacea is at the cross-roads of the Austronesian and Melanesian worlds.[6] Wallacea is the westernmost region in which languages from Papuan families are found alongside languages of the Austronesian family (Map 4). A language family is a group of languages descended from a common ancestor, called a proto-language. Language families are most reliably established through the application of the Comparative Method (Weiss 2014). However, in the case of Wallacean languages, the lack of sufficient data on the languages has meant that more speculative, less rigorous tools have often been used to posit language families or their subgroups (see, e.g., the West Papuan family and many other families put forward in Wurm 1975). This has led to many language groupings persisting in the literature despite their not bearing up under proper scrutiny of data as it becomes available. In this section, I present a conservative (or so-called "splitting") view of Wallacean genetic groupings that have been, or on current knowledge are likely to be establishable, by the Comparative Method.

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6. The term "Melanesia" has been used variously in different disciplines at different times (see Lawson 2013). Whilst "Melanesia" traditionally takes in all of New Guinea, there is an asymmetry in the term's application to the maritime regions east and west of New Guinea. The label "Island Melanesia" has conventionally been applied only to the islands to the east of New Guinea, taking in the islands of Papua New Guinea, the Solomon Islands, Vanuatu and New Caledonia, as, for instance, in Spriggs (1997), Moore (2003) and Dunn et al. (2008). On ethnological, linguistic and genetic grounds, however, Wallacea must also be seen as part of Melanesia, although that label has not been traditionally applied to it.
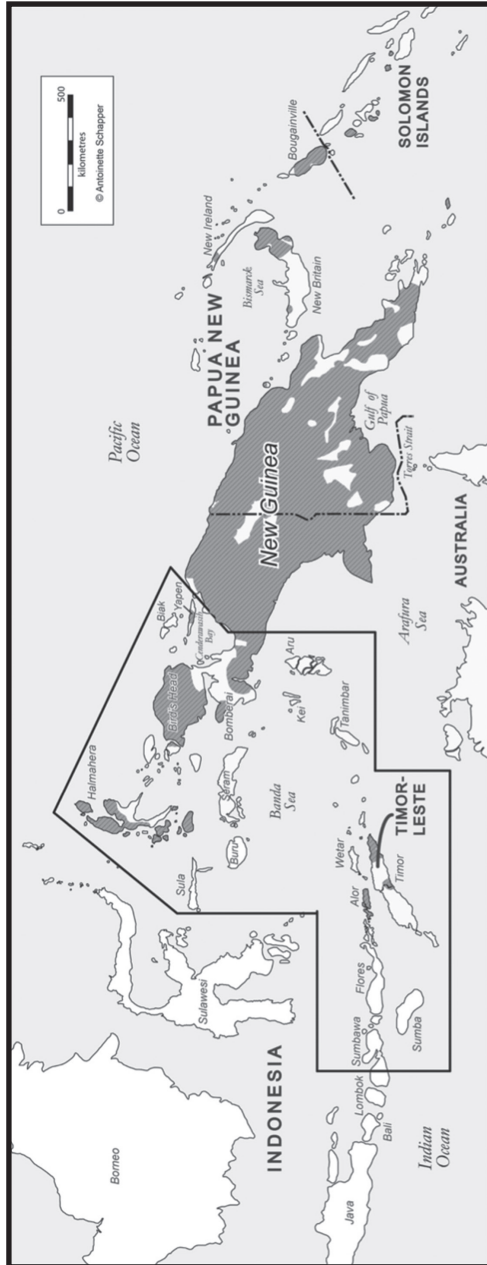
Map 4 – Wallacea at the crossroads of Austronesian and Melanesia.

Papuan languages are marked by hatching: Austronesian languages are spoken elsewhere outside the Australian continent. The black line takes in the area in which non-Oceanic Central Eastern Malayo-Polynesian languages of the Austronesian family are found, together with the Papuan languages of Wallacea. The Wallacean features described in section 5 are found in languages within this area.

The Papuan families of Wallacea (Map 5) can be geographically divided into mainland (New Guinea) and "outlier" languages. There are three outlier families: (i) the Timor-Alor-Pantar family, consisting of around 30 languages scattered among Austronesian languages in eastern and central Timor, and dominating on the islands of Alor and Pantar; (ii) the North Halmahera family, encompassing around a dozen languages on Halmahera Island and some small satellite islands in northern Maluku; (iii) the Yawa family, comprising two languages offshore in Cenderawasih Bay: Yawa spoken in central Yapen Island, and its closely related sister language, Saweru, spoken on Saweru Island just south of Yapen. On the New Guinea mainland, we find multiple families and language isolates (essentially, one-language families). On the Bird's Head there are the East Bird's Head family, the West Bird's Head family and the South Bird's Head family, as well as three isolates. On the Bomberai Peninsula are the West Bomberai family and two isolates, Mor and Tanahmerah (also known as Sumeri), while on the Bird's Neck we find members of the Mairasi family.[7]

The Austronesian languages have their homeland in Formosa (modern-day Taiwan) and spread throughout Island Southeast Asia and into the Pacific from around 4500 BP (Pawley and Ross 1993, Pawley 2003). By 3500 BP, Austronesians appear to have reached Wallacea (Bellwood 2006). At exactly what level the more than one hundred Austronesian languages of Wallacea are related to one another is disputed. Blust (1982/1983, 1993) maintains that the Austronesian languages of Wallacea all belong to the Central-Eastern Malayo-Polynesian (CEMP) subgroup. This subgroup, he asserts, itself divides into two subgroups, Central Malayo-Polynesian (CMP) and Eastern Malayo-Polynesian (EMP). The EMP subgroup, as defined by Blust, divides into two subgroups again, South Halmahera-West New Guinea (SHWNG) and Oceanic (Oc). The CMP subgroup takes in the Austronesian languages of Timor-Leste and East Nusa Tenggara as far east as Bima on the eastern half of Sumbawa Island, as well as those of southern and central Maluku. The SWHNG subgroup includes the Austronesian languages of northern Maluku (south Halmahera and Raja Ampat) and Cenderawasih Bay as far as Warembori at the mouth of the Mamberano river, as well as Irarutu on the Bomberai Peninsula. Oceanic languages are found east of Warembori and fall outside of what we will define as Wallacea.

Whilst SHWNG and Oceanic are well supported and widely credited

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7. The East Geelvink Bay family and the isolate Kehu at the northern border of Wallacea need to be studied in much greater detail before they can be definitively included in or excluded from the area. The South Bird's Head family is surrounded by families included in Wallacea and so is included in the area for the purposes of this study. It must be noted, however, that we have so little information on the South Bird's Head languages that we cannot say whether they are truly part of the Wallacean Linguistic Area.

subgroups among Austronesian historical linguists,[8] CEMP, CMP and EMP are not broadly accepted. This is because the innovations that critically define the subgroups, are not always present in every claimed member of the proposed subgroups, or are not limited to them (see Adelaar 2005: 24-26 and Ross 1995: 84-85 for overviews of the problems associated with these groupings). Donohue and Grimes (2008) argue that the similarities observed in Blust's CEMP languages are in fact not shared innovations signalling descent from an immediate common ancestor, but rather are due to commonly held substratum effects from Papuan languages. Schapper (2011a) similarly argues that the marsupial reconstructions that Blust places much weight on in defining CEMP are in fact erratic diffusions from an ultimately Papuan source.
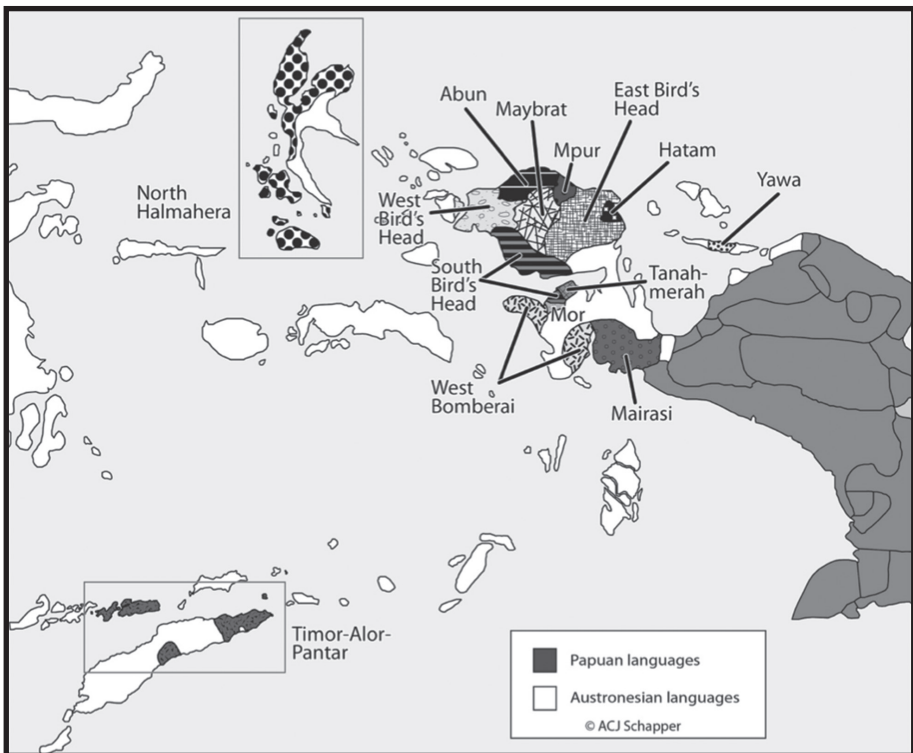
Map 5 – Papuan languages of Wallacea

8. The exact constituency of SHWNG is unclear. There are several other Austronesian languages on Bomberai such as Arguni, Kowiai, Onin, and Sekar about which very little is known. Compare Blust (1978), Ross (1995), Kamholz (2014) for different statements of the SHWNG subgroup and the constituency of these languages.

Linguistic Melanesia

Understanding Linguistic Wallacea and its place at the cross-roads of the Austronesian and Melanesian worlds means having a broader picture of the linguistic patterns that define Austronesian and Papuan languages. In this section I show how Austronesian languages converge on the linguistic norms of Papuan languages the closer they are to New Guinea. The progressive replacement of individual Austronesian features by Melanesian ones results in concentric circles of linguistic features clustering around New Guinea, defining a sphere of Papuan influence which I shall refer to as "Linguistic Melanesia." Austronesian languages caught within this sphere of influence I will refer to as "Melanesian Austronesian" languages. I will describe only a few of the most well-defined features of Linguistic Melanesia, progressing from largest to smallest in terms of the extent of their appearance in Austronesian languages around New Guinea.

Possessive Classification

The Melanesian feature with the widest reach beyond New Guinea is possessive classification (Map 6). This is where nouns are divided into possessive classes and the possessive construction into which each class enters is distinct.[9]

Possessive classification takes many forms in Melanesian Austronesian and has been assigned many different labels depending on the exact semantics of the possessive classes and the form(s) marking the possessive relationship (e.g., alienable-inalienable, dominant-subordinate, direct-indirect etc.). For instance, in Samoan, one class of nouns (illustrated by *paopao* "canoe" in 1a) is possessed with the possessive morpheme *o*, while another class (illustrated by *naifi* "knife" in 1b) is possessed with the possessive morpheme *a*. Nouns from the *o*-class cannot be possessed with the *a* possessive and vice versa.

Samoan (Austronesian, Samoa, Polynesia; Lynch, Ross & Crowley 2002: 43)

(1)　　a.　　*le*　　*paopao*　　　　***o***　　　*Tavita*
　　　　　　　ART　　canoe　　　　POSS　　Tavita
　　　　　　　"Tavita's canoe"
　　　　b.　　*le*　　*naifi*　　***a***　　*le*　　*tule'ale'a*
　　　　　　　ART　　knife　　POSS　　ART　　young.man
　　　　　　　"the young man's knife"

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9. This definition means that different obligatoriness of one and the same possessive construction does not count as possessive classification.

In Ujir one class of nouns (illustrated by *mata-* "eye" in 2a) is possessed with a possessive suffix, while the other class (illustrated by *juma* "house" in 2b) is possessed with a free possessive morpheme.

Ujir (Austronesian, Aru Islands, Indonesia; own fieldnotes)

(2)   a.   *mata-ng*
             eye-**1sg.poss**
             "my eye"
       b.   ***kanang***   *juma*
             1sg.poss   house
             "my house"

Possessive classification is typical of many Papuan languages, east and west of New Guinea. This is illustrated by Sulka and Bunaq. In each language, we see there are distinct forms for expressing the possessive relationship depending on the possessed noun.

Sulka (isolate, New Britain, PNG; Tharp 1996: 80)

(3)   a.   ***ko-****nan*
             1sg.poss-mother
             "my mother"
       b.   ***kua-****rik*
             1sg.poss-house
             "my house"

Bunaq (Timor-Alor-Pantar, Timor, Indonesia/Timor-Leste; own fieldnotes)

(4)   a.   ***n-****iol*
             1sg.poss-voice
             "my voice"
       b.   ***nie***   *zo*
             1sg.poss   mango
             "my mango"

Mapping the distribution of possessive classification in Austronesian languages we see a clear skewing of this feature towards Melanesia. There are outliers to the west: Puyuma in Taiwan and Bidayuh languages in West Borneo (Adelaar 2005:25). They do not, however, diminish the clear dominance of the feature around New Guinea and out into Oceania. On the New Guinea mainland, possessive classification is often absent in Papuan languages of the central highlands and sometimes absent in those along the north coastal region. However, possessive classification is much more often present in Papuan languages than it is absent and is found in most Papuan families extending the full length of the Papuan area.
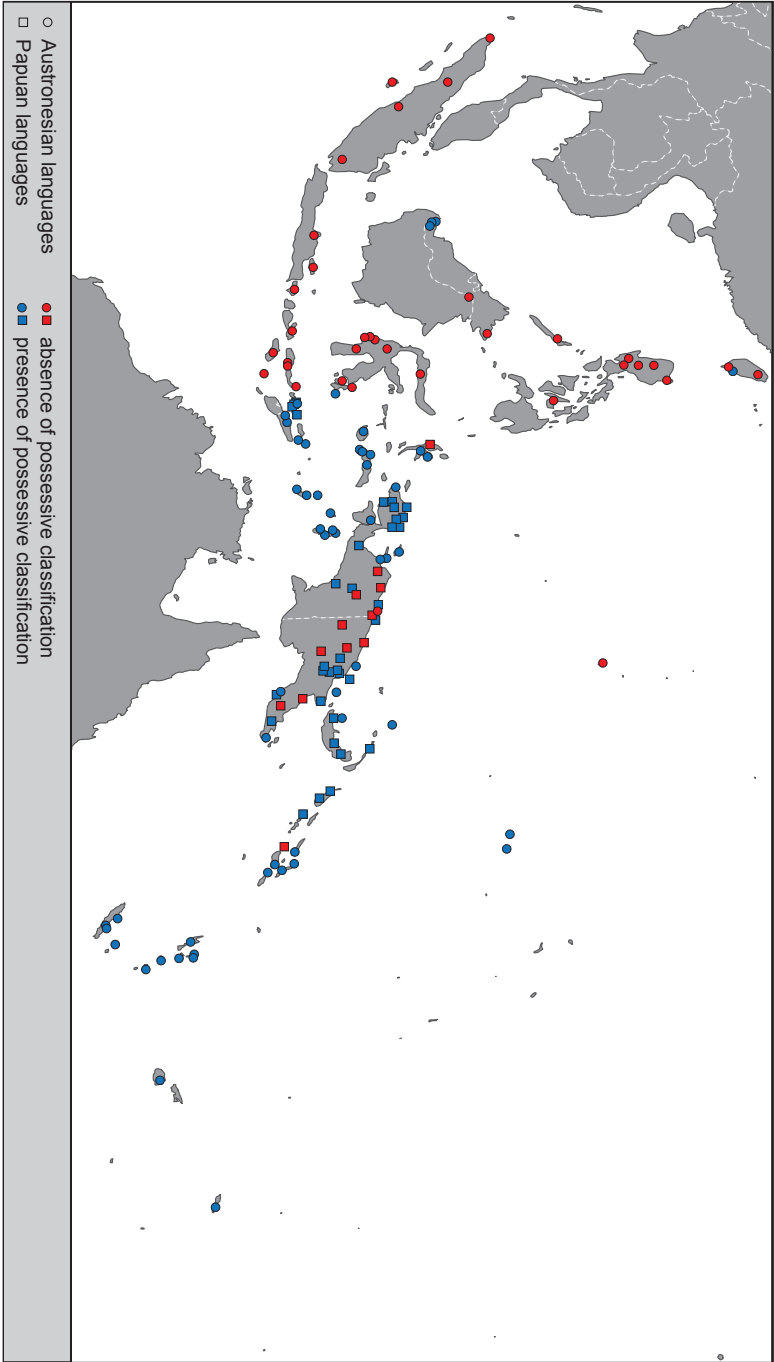
Map 6 – Possessive classification in Austronesian and Papuan languages. (Infography: © L. Billault, IRD)

This map presents 144 languages, 95 Austronesian and 49 Papuan. Of these, 59 Austronesian and 37 Papuan languages have possessive classification. It is based on a synthesis of Adelaar (2005: 25), Donohue and Schapper (2008), Klamer et al. (2008), Lichtenberk (2013), Nichols & Bickel (2013), and Terrill (2002).
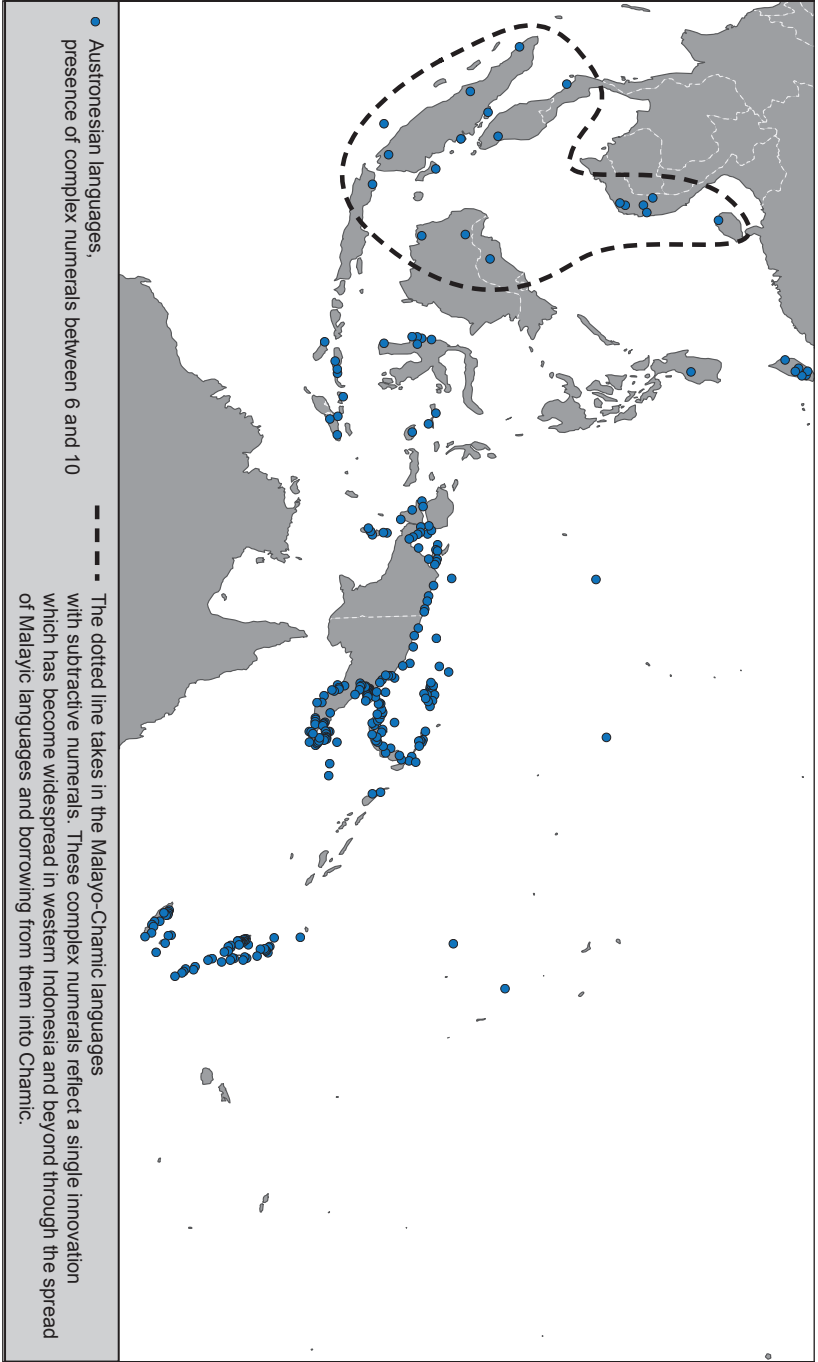
Legend:
- ○ Austronesian languages
- □ Papuan languages
- ■ (red) absence of possessive classification
- ■ (blue) presence of possessive classification

Complex Numerals below Ten

The composition of numerals between "six" and "ten" becomes complex in many Austronesian languages in the proximity of New Guinea (Map 7). A complex numeral is one that is composed of other numerals by means of an arithmetical operation between component numerals (thus, an "additive" complex numeral may be composed of, e.g., 6+1 = 7; "subtractive" complex numeral, e.g., 10−2 = 8, and "multiplicative" complex numeral, e.g., 3x2 = 6).

Proto-Austronesian (PAN), the common ancestor of all Austronesian languages, and Proto-Oceanic (POc), PAN's most significant daughter and the most immediate common ancestor of all Oceanic languages, both had simplex numerals (numerals not composed of other numerals) and these are reflected in many modern day Austronesian languages across the full sweep of the Austronesian area. Table 1 sets out some examples.

	PAN	POc	Cebuano (Austronesian, Philippines)	Mentawai (Austronesian, Barrier Islands)	Longgu (Austronesian, Solomon Islands)
1	*esa/isa	*ta-sa/(sa)-kai	*usa*	*sara*	*eta*
2	*duSa	*rua	*duha*	*dua*	*rua*
3	*telu	*tolu	*tulu*	*telu*	*olu*
4	*Sepat	*pat(i)	*upat*	*epat*	*vai*
5	*lima	*lima	*lima*	*lima*	*lima*
6	*enem	*onom	*unum*	*enem*	*ono*
7	*pitu	*pitu	*pitu*	*pitu*	*viu*
8	*walu	*walu	*walu*	*balu*	*walu*
9	*Siwa	*siwa	*siyam*	*siba*	*siwa*
10	*sa-puluq	*sa[-ŋa]-puluq	*napuluq*	*sapulu*	*tangavulu*

Table 1 – Examples of Austronesian simplex numerals

Legend (rotated within map):

- Austronesian languages, presence of complex numerals between 6 and 10

- - - - The dotted line takes in the Malayo-Chamic languages with subtractive numerals. These complex numerals reflect a single innovation which has become widespread in western Indonesia and beyond through the spread of Malayic languages and borrowing from them into Chamic.

Map 7 – Complex numerals in Austronesian languages. (Infography: © L. Billault, IRD)

This map presents 308 Austronesian languages with complex numerals. It is based on the numeral database at http://www.zompist.com/numbers.shtml and comprises a synthesis of the analyses of Bender & Beller (2006), Lean (1992), Li (2006), Lynch (2009), and Schapper & Hammarström (2013).

By contrast, in many Austronesian languages on and around New Guinea we find complex numerals of many different kinds. Table 2 sets out a few examples. Square brackets indicate the arithmetical operation used to form the numeral. We see that a single language may use more than one kind of operation to form its complex numerals and that the complex numerals need not be used for all numerals between six and ten.

	Rongga (Austronesian, Flores)	Mambae (Austronesian, Timor)	Onin (Austronesian, Bomberai Peninsula)	Pak (Austronesian, Admiralty Islands)	Lewo (Austronesian, Vanuatu)
1	*(e)sa*	*id*	*sa*	*dih*	*taaŋa*
2	*ɹua*	*ru ~ rua*	*nuwa*	*huo*	*lua*
3	*telu*	*teul ~ tel*	*teni*	*loh*	*telu*
4	*wutu*	*fat ~ pat*	*fãt*	*alor*	*hat vari*
5	*lima*	*lim*	*nima*	*nuron*	*lima*
6	*lima esa* [5+1]	*lim nain ide* [5+1]	*nem*	*wono*	*orai* [5+1]
7	*lima ɹua* [5+2]	*lim nai rua* [5+2]	*tara sa* [6+1]	*arloh* [10-3]	*olua* [5+2]
8	*ɹua mbhutu* [2x4]	*lim nai telu* [5+3]	*tara nuwa* [6+2]	*arhuo* [10-2]	*orelu* [5+3]
9	*tara esa* [10-1]	*lim nai pata* [5+4]	*sa puti* [10-1]	*ardih* [10-1]	*ovari* [5+4]
10	*sambulu*	*sakul ~ sagul*	*pusua*	*songo*	*lua-lima* [5x2]

Table 2 – Examples of Melanesian Austronesian complex numerals

When we map the distribution of Austronesian languages with complex numerals for between "six" and "ten," we again observe a striking clustering within Melanesia. Complex numerals are recurrent eastwards from Flores to New Guinea and persist throughout the Bismarck Archipelago and into Vanuatu and New Caledonia. Outliers are limited to the following six groups: (i) several Formosan languages with additive and multiplicative numerals; (ii) Malayo-Chamic subtractive numerals "eight" and "nine" (the large number of points on Map 7 merely reflects the wide dispersal of this subgroup's daughter languages), representing a single innovation in their common ancestor; (iii) Enggano with its base-5 system; (iv) South Sulawesi subtractive numerals "eight" and "nine," also representing a single innovation in their common

ancestor; (iv) Makasarese additive "seven"; (vi) Ilongot quinary numerals for "six" through "nine," and; (vii) a few Micronesian languages with subtractive numerals for "eight" and/or "nine." By contrast there over 50 distinct innovations of complex numerals in Austronesian languages of the Melanesian area (Schapper & Hammarström 2013, Blust 2008).

Papuan languages have notoriously varied counting systems including many rare types such as restricted systems and body-tally systems (Hammarström 2010). Crucially, while the actual nature of the systems are various, Papuan languages typically possess complex expressions for "six" to "ten" (Lean 1992, Galis 1955, 1960, Schapper & Klamer 2014).

Order of Noun and Numeral

The order of the numeral and the noun it enumerates also changes in Austronesian languages with proximity to New Guinea (Map 8).[10]

In most Austronesian languages outside of Melanesia, the numeral normally precedes the noun, as shown for Tagalog in (5).

Tagalog (Austronesian, Philippines; Gil 2013)

(5)   ***dalawa**=ng*   *aso*
       two=LIG   dog
       "two dogs"

By contrast, in Austronesian languages further east, the numeral follows the noun. This is shown for Luang, Mbula and Araki.

Luang (Austronesian, Southwest Maluku, Indonesia; Taber 1999)

(6)   *muanke'a*   *riy*   ***wo'itu***
       male   person seven
       "seven men"

Mbula (Austronesian, Umboi Island, PNG; Bugenhagen & Bugenhagen 2007)

(7)   *me*   *tio*   ***ru***
       dog   1SG.POSS   two
       "my two dogs"

Araki (Austronesian, Vanuatu; François 2002)

(8)   *racu*   *rapudo*   ***rolu***
       man   CLF   two
       "two men"

_____
10. Note that in this section as well as in the sections on noun-genitive order and verb-negator order we are concerned only with dominant word order, as defined by Dryer (2013e). Variant word orders are of course present in many languages, but they are beyond the scope of this paper.
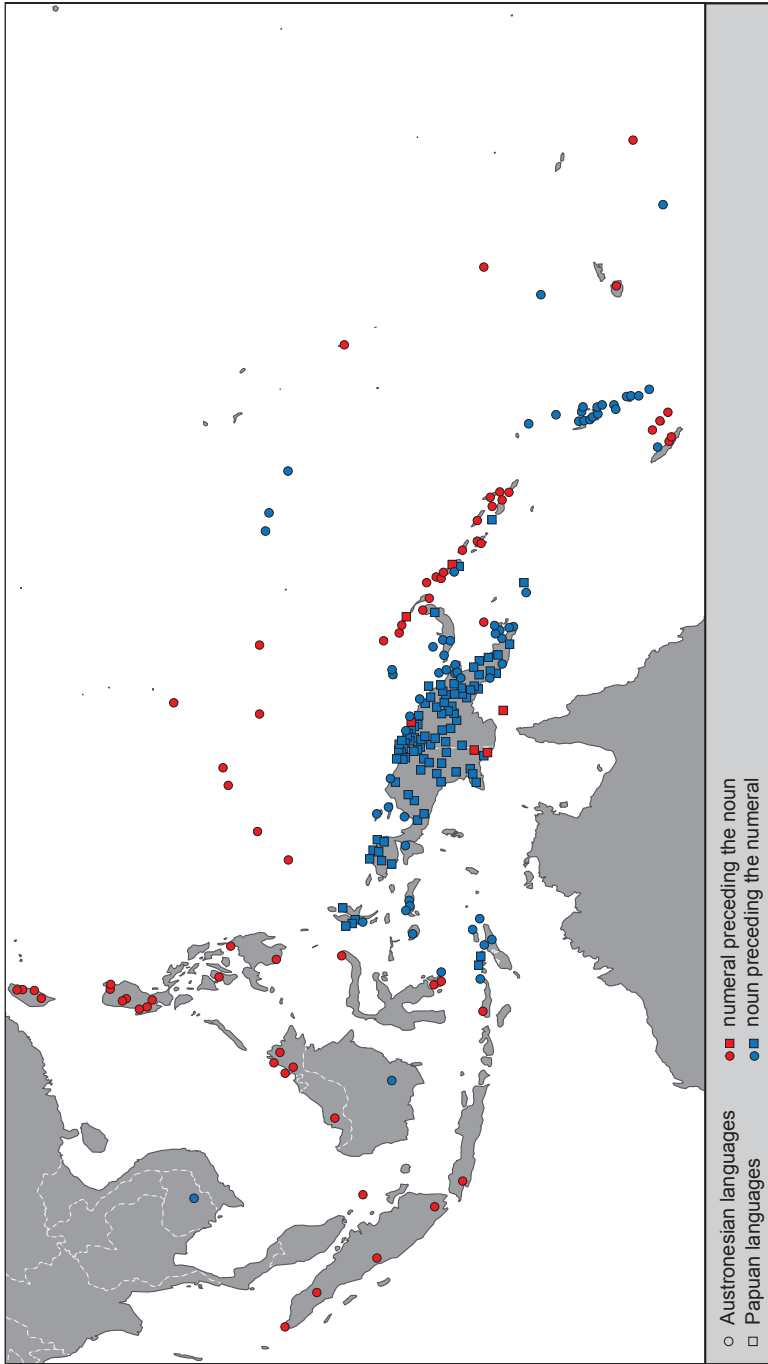
Map 8 – Order of noun and numeral in Austronesian and Papuan languages. (Infography: © L. Billault, IRD)

This map presents 261 languages, 142 Austronesian and 119 Papuan. Of these, 75 Austronesian and 108 Papuan languages have the numeral following the noun. It uses the data from Dryer (2013a) and follows the argumentation of Donohue (2007).

The vast majority of Papuan languages have the numeral following the noun (over 90% in the sample of Dryer 2013a). Unsurprisingly, we again see a clear skewing of noun-numeral order in Austronesian languages towards Melanesia. There are only three outliers to the west: Ma'anyan, Western Cham and Pawnee. Otherwise the feature extends unbrokenly from Timor to New Guinea, and is almost invariably present in Austronesian languages of the New Guinea mainland and further as far as Vanuatu. The Austronesian languages of the Bismarck Archipelago, New Caledonia, Micronesia and Polynesia are in their majority numeral-noun order languages, but each region has a few exponents of the Melanesian noun-numeral order.

The Velar Nasal /ŋ/

The next feature with a striking distribution in the Melanesian area is the absence of the velar nasal phoneme (Map 9). This is the sound /ŋ/, written in languages such as English and Indonesian with the letters *ng* as in English si**ng** or Indonesian ta**ng**an.

The vast majority of Austronesian languages have the velar nasal in their consonant phoneme inventories (more than 82% of Donohue et al.'s 2013 sample). Around New Guinea there is a clear concentration of Austronesian languages lacking the velar nasal. The lack of the velar nasal in Austronesian languages begins in Timor, moves through South-west Maluku, Central Maluku and the languages of the Bomberai Peninsula and Cenderawasih Bay. On the north coast of New Guinea roughly half the Austronesian languages lack the velar nasal, while on the Bird's Tail of New Guinea almost all Austronesian languages lack it. A smattering of Austronesian languages without velar nasals are then found in the Bismark archipelago and northern Vanuatu. Beyond this, we find only two Austronesian outliers to the West (Nias and Enggano) in the Barrier Islands off the west coast of Sumatra, and five outliers in remote Polynesia.

Papuan languages are divided roughly in half in terms of the velar nasal: present in 221 Papuan languages, and absent in 293 (57%). Viewed in isolation then the lack of the velar nasal in Melanesia does not seem remarkable; however, taking a larger areal perspective encompassing Mainland Southeast Asia and Australia where the velar nasal is near-universally present, the absence of phonemic ŋ becomes a highly marked feature of the Melanesian area (Anderson 2013). What is more, velar nasal-lacking Papuan languages are concentrated in the maritime and coastal regions to the West of New Guinea and from the central northern region down off the Bird's Back and into the Bird's Tail region, precisely the regions where velar nasal-lacking Austronesian languages are most found.
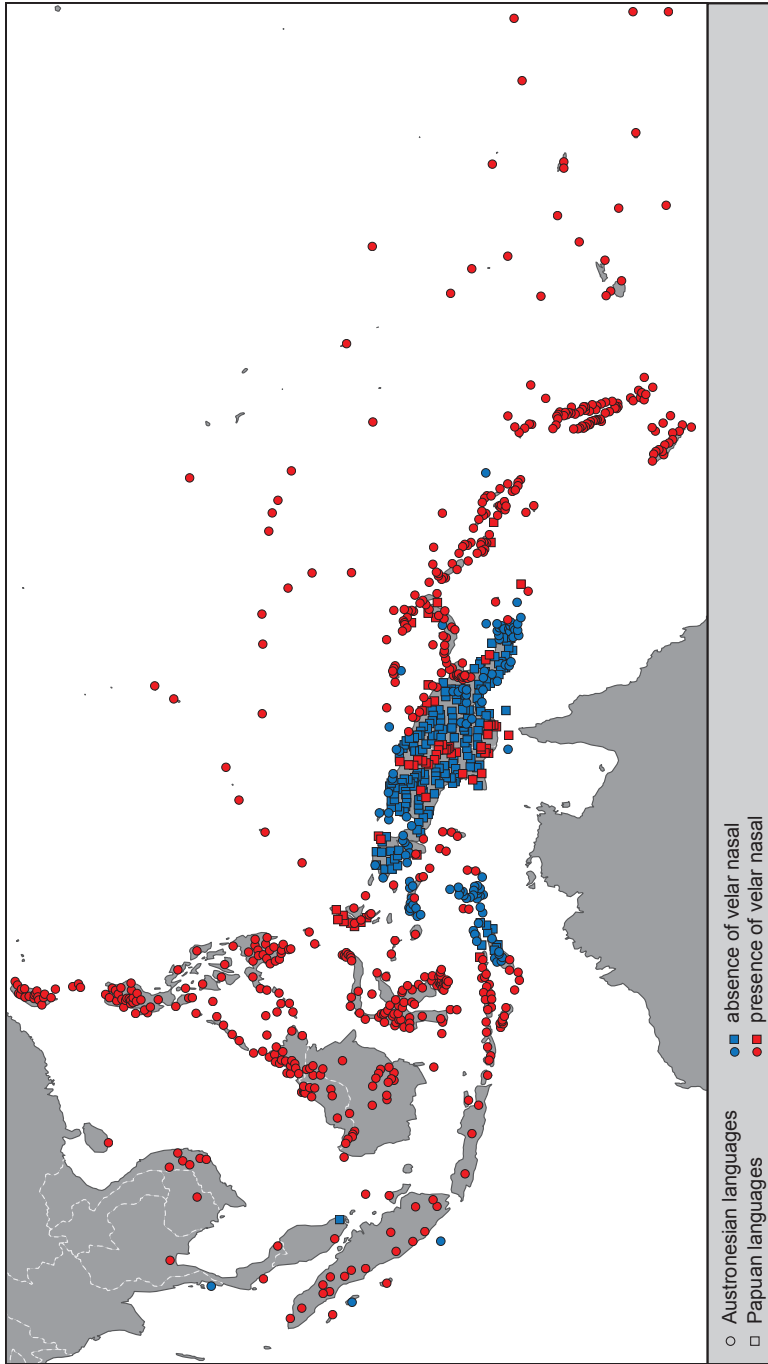
Map 9 – Velar nasal in Austronesian and Papuan languages. (Infography: ©L. Billault, IRD) This map presents 1339 language varieties (languages and language dialects), 825 Austronesian and 514 Papuan. Of these, 142 Austronesian and 293 Papuan languages lack the velar nasal. It is adapted from Donohue et al (2013).

Austronesian languages
○ absence of velar nasal
● presence of velar nasal

Papuan languages
□ absence of velar nasal
■ presence of velar nasal

Order of Noun and Genitive

The most famous and first recognised feature to define the Melanesian area is the so-called "reversed genitive" (Brandes 1884) (Map 10). This feature looks at the relative order of noun and possessor (genitive), as in English *tail of the dog* [noun preceding genitive] versus *the dog's tail* [genitive preceding noun]).

The typical Austronesian pattern outside of Melanesia has the genitive following the noun, as shown for Mualang and Boumaa Fijian in (9) and (10).

Mualang (Austronesian, West Kalimantan, Indonesia; Tjia 2007)

(9)   *kisah*   ***antu***
         story   ghost
         "story **of a ghost**"

Boumaa Fijian (Austronesian, Fiji, Polynesia; Dixon 1988)

(10)   *a*   *liga-i*   ***Jone***
         ART   hand-LIG   John
         "**John's** hand"

By contrast, as with numeral-noun order, in Austronesian languages on or close to New Guinea, the order of the genitive is "reversed" and typically precedes the noun, as in Tokodede and Sudest.

Tokodede (Austronesian, Timor-Leste; own fieldnotes)

(11)   ***Luis***   *ni*   *dagana*
         Louis   POSS   head
         "**Louis'** head"

Sudest (Austronesian, Tagula Island, PNG; Anderson 2007)

(12)   ***anawang***-*gu*   *langgogwe*
         ear-1SG.POSS   wax
         "my **ear's** wax"

Almost all Papuan languages have the noun following the genitive (95% in the sample of Dryer 2013b; there is an areally very restricted pocket of Papuan languages with noun-genitive order on the north-central coast). Austronesian languages with the reversed genitive are heavily concentrated in Melanesia; two languages in Micronesia, Ulithian and Puluwat, are the only outliers. The feature is dispersed throughout eastern Indonesia and into New Guinea where it is consistently present in Austronesian languages, but not beyond into the Bismarck Archipelago or further afield into the Pacific.
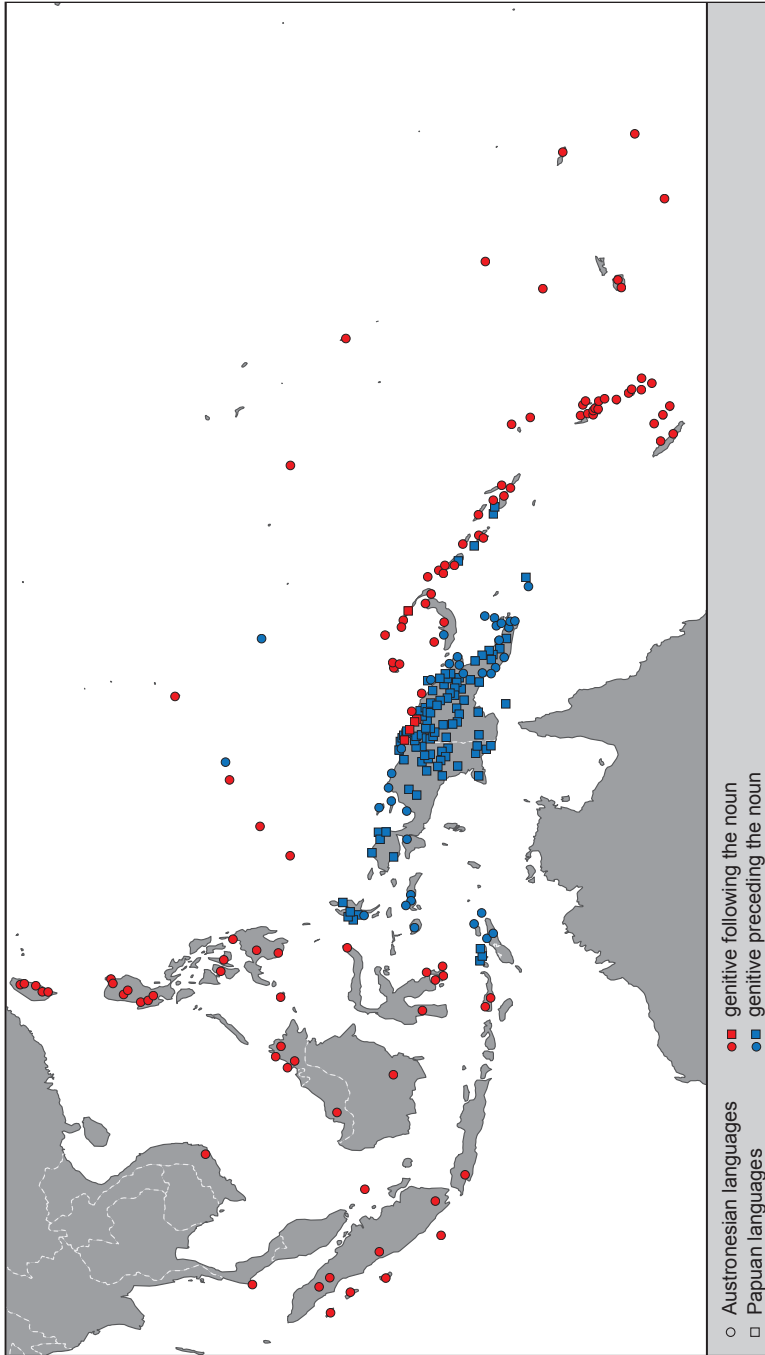
Map 10 – Order of noun and genitive in Austronesian and Papuan languages. (Infography: © L. Billault, IRD) This map presents 272 languages, 152 Austronesian and 120 Papuan. Of these, 40 Austronesian and 114 Papuan languages have the genitive preceding the noun. It uses the data from Dryer (2013b) and follows the argumentation of Donohue (2007).

Order of Verb and Negator

In this section, we are concerned with whether a language has a basic negative word (such as English *not*) that precedes or follows the verb it negates (Map 11). The order of the verb and negator can often be observed to switch in Austronesian languages within the Melanesian area.

The typical pattern in Austronesian languages is to have the negator preceding the verb. This is illustrated in the following languages, as in (13) and (14).

Kemak (Austronesian, Timor, Indonesia/Timor-Leste; own fieldnotes)

(13)   *Ua*   ***tai***   *bue.*
        3SG   NEG   sleep
        "He didn't sleep."

Ughele (Austronesian, Solomon Islands; Frostad 2013: 63)

(14)   *...*   *mana*   ***kai***   *doghor-i*   *rie*   *ka*   *ru.*
                 but   NEG   see-3PL   3PL   PART   two
        "... but (their mother) didn't see them."

Near New Guinea this pattern sporadically gives way to the negator following the verb, as in (15) and (16). The post-verbal negator in Austronesian languages begins in the islands just to the west of Timor (but skips Timor itself), moves through Central Maluku and the languages of Bomberai Peninsula and Cenderawasih Bay. Moving east, the postverbal negator is found in the Austronesian languages along the north coast of New Guinea stopping in the Madang district and West New Britain. Outliers are limited to two in our sample: Cham in the west and Vanikoro in the east (though more indepth sampling may reveal that postverbal negation extends as far as the latter).

Sawu (Austronesian, Sawu Island, Indonesia; Walker 1982: 47)

(15)   *Wae*   ***d'o***   *ke*   *ta*   *pe-hianga*   *roo.*
        want   NEG   PART   ASP   RECP-friend   3PL
        "They do not want to be friends."

Kaulong (Austronesian, western New Britain, PNG; Ross 2002: 401)

(16)   *Eiak*   *men*   *ngi-n*   ***som***.
        stone.axe   DELIM   tooth-3SG   NEG
        "The axe isn't sharp."

This feature in Austronesian languages is particularly striking as it is not seen under normal circumstances to co-occur with the SVO and VSO word orders typical of Austronesian, but correlates much more with SOV word order as is found in most Papuan families (Dryer 2013c). Still, compared with the other Melanesian features examined here, post-verbal negation has only diffused into Austronesian languages to a much more limited extent. This can be explained by the fact that Papuan languages are themselves very diverse in how they encode
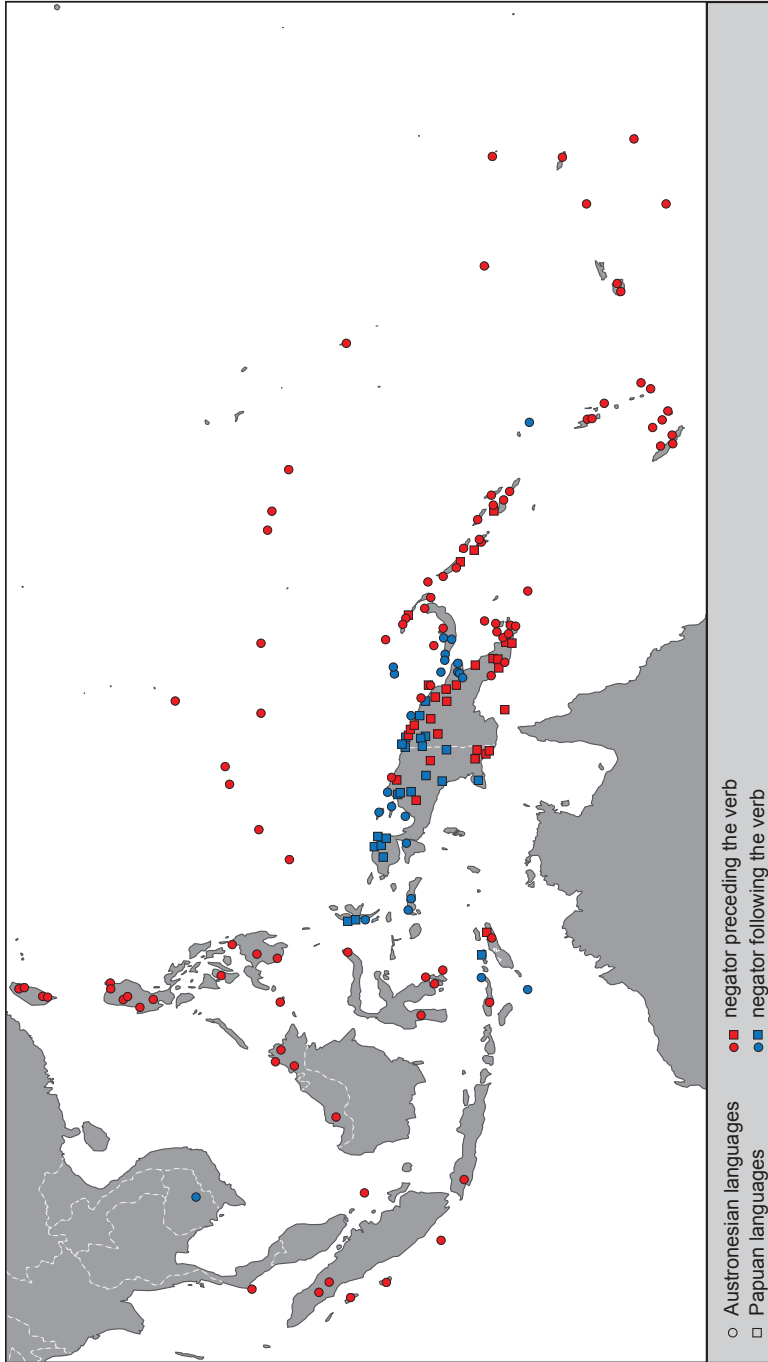
Map 11 – Order of verb and negator in Austronesian and Papuan languages. (Infography: © L. Billault, IRD) This map presents 185 languages, 126 Austronesian and 59 Papuan. Of these, 25 Austronesian and 25 Papuan languages have the negator following the verb. It uses the data from Dryer (2013c) and builds on Reesink (2002) and Klamer et al. (2008).

negation. In the sample considered here, only 43% of Papuan languages have postverbal negation. Apart from the preverbal and postverbal negators that we have looke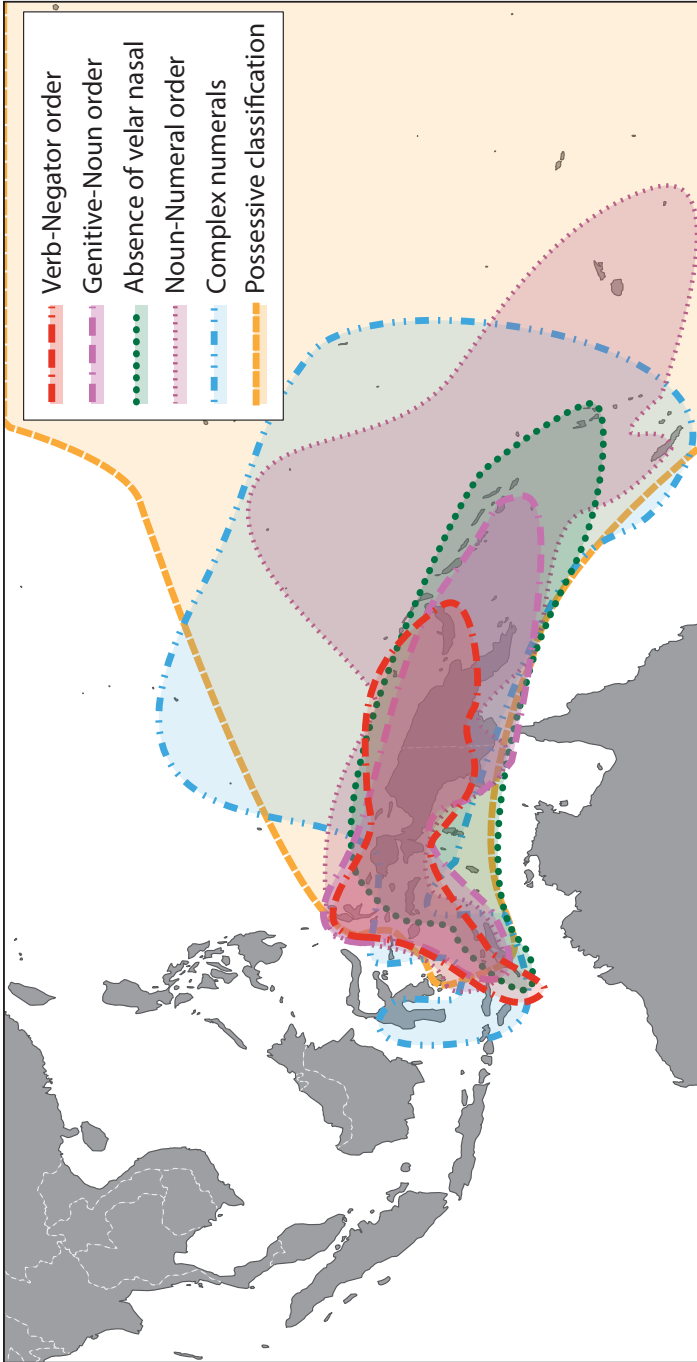d at, there are also many other strategies evidenced including affixal negation and tonal negation (see Dryer 2013c for a full account of the other strategies). It should be noted that this variety in Papuan languages does not diminish the areality of the feature in Austronesian languages, since a Papuan language is statistically still more likely to have post-verbal negation than an Austronesian language (Reesink 2002, Vossen & van der Auwera 2013).

Summary

In the previous sections we have seen that Austronesian languages converge on the linguistic norms of Papuan languages the closer they are to New Guinea. The progressive attenuation of individual Austronesian features to Melanesian ones results in concentric circles of linguistic features clustering around New Guinea, defining what I call "Linguistic Melanesia" which extends well beyond New Guinea. Map 12 sets out the area on the basis of the features considered here. We see Linguistic Melanesia begins in the area of Flores-Sumba-Timor reaches through New Guinea and into the Bismark Archipelago, and concludes in Vanuatu-New Caledonia. Interestingly, whilst in the west Linguistic Melanesia correlates roughly with the extent of Papuan languages, in the east the "effects" of Melanesian influence extend far beyond extant Papuan languages, but reach into Vanuatu and New Caledonia where no Papuan languages are found. In-depth analysis of the distribution of additional features (e.g., the appearance of person-number agreement on verbs, Himmelmann 2005; prenasalisation of plosives, Donohue & Whiting 2011; the absence of passive voice morphology; postverbal aspect markers, Reesink 2009; the use of serial verb constructions, Van Staden & Reesink 2009) will in the future contribute further to understanding and defining Linguistic Melanesia.

The idea that Papuan languages have influenced the Austronesian languages in their vicinity is nothing new. For example: at least since Brandes (1884) the development of genitive–noun word order in place of the conservative Austronesian noun–genitive order has been attributed to Papuan contact; Galis (1960) already observed that many Austronesian languages to the north of New Guinea have exchanged the ancestral decimal system for quinary systems as found in many Papuan languages. However, the distribution of such features has rarely been looked at, as here, in a single picture with languages from both to the west and the east of New Guinea (notable exceptions are Donohue 2007 and Reesink et al. 2009). What is more, the features have not been brought together to define an area of "Linguistic Melanesia". Rather, discussion of individual features has typically been scattered throughout the linguistic literature on the region and has remained inaccessible to the non-specialist, non-linguist. In taking a more holistic approach here we set the stage for understanding the place of, and features defining, Linguistic Wallacea.

Map 12 – Linguistic Melanesian features viewed together. (Infography: © L. Billault, IRD)

Legend:
- Verb-Negator order
- Genitive-Noun order
- Absence of velar nasal
- Noun-Numeral order
- Complex numerals
- Possessive classification

Linguistic Wallacea

That such "Papuan" features as we have looked at in the previous section appear for the first time in languages of Wallacea does not define Wallacea as a linguistic area. This is because these features are not areally well demarcated: that is, they are not limited in any significant way either to Austronesian or Papuan languages within Wallacea. This finding is contrary to previous statements of the region as a linguistic area, in particular Klamer (2002), Klamer et al. (2008) and Musgrave (2008). These works fail to look east as well as west when defining the area, instead they at best consider features only in comparison to the Austronesian languages further to the west, that is, outside the Melanesian area. The result is that features that are Melanesian rather than specifically Wallacean have been erroneously used to define the area (see, e.g., Ross' 2003 and Donohue's 2004 criticisms of Klamer 2002 or Vossen & van der Auwera 2013's demonstration of the New Guinea-wide distribution of the negatives discussed in Klamer et al. 2008).

In this section, I show that there are indeed linguistic features that can be used to define Wallacea as a linguistic area largely to the exclusion of both languages further east and west. Furthermore, the features I identify are for the most part highly distinctive, even though they are not necessarily consistently displayed across the area. All features cross familial lines, and in most cases cross not only the Austronesian-Papuan divide, but also the Papuan-Papuan divide, that is, appear in multiple distinct Papuan families. The cross-Papuan family presence of these geographically delimited features, I suggest, reflects an ancient linguistic area in Wallacea that predates the Austronesian dispersal, but that now includes the Austronesian languages due to the substratal influence of Papuan languages on them: in other words, because previous Papuan language-speaking populations have switched to Austronesian languages.

Semantic Alignment of Verbal Person Markers

Semantic alignment of verbal person markers is where a language splits the way subjects and objects show agreement on the verb. For instance, in Kamang we see that the subject of an intransitive verb (S) is split in that sometimes it is encoded like the subject of a transitive verb (A) and other times like the object of a transitive verb (P).[11] Thus in (17a) the subject of the intransitive verb is encoded with a prefix, while in (17b) the subject of the intransitive verb occurs without a prefix. In (17c) we see that the transitive verb encodes the object with a prefix like the verb in (17a), but the subject without a prefix like the verb in (17b).

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11. See footnote 5 on the non-technical way in which "subject" and "object" are used in this paper.

Kamang (Timor-Alor-Pantar, Alor, Indonesia; own fieldnotes)

(17)   a.   ***Na-maitan-si.***
              1SG-hunger-IPFV
              "I'm hungry."

      b.   *Markus kawailai-si.*
              Markus stumble-IPFV
              "Markus stumbles."

      c.   *Markus **na**-tak-si.*
              Markus 1SG-see-IPFV
              "Markus sees me."

Such splits as seen with semantic alignment are not phonologically determined, but are based on syntactic divisions which, often, at least partially reflect semantic features such as activeness, effectedness, control (volition), aspect and so forth (Donohue 2008a). For instance, in Wersing, the verb *lailol* "walk" normally occurs without a prefix where the subject is a controlling participant actively engaged in the act of walking (18a). It can, however, occur with a subject agreement prefix on the verb where the act of walking is as yet unrealized, with the participant poised to walk (18b).

Wersing (Timor-Alor-Pantar, Alor, Indonesia; own fieldnotes)

(18)   a.   *Naida*   *lailol.*
              1SG   walk
              "I'm walking."

      b.   *Naida*   ***ne**-lailol.*
              1SG   1SG-walk
              "I'm about to get walking."

Semantic alignment is relatively infrequent in the languages of the world and therefore highly marked (Siewierska 2013), particularly in many of its manifestations within Wallacea (Donohue 2004: 231). Across the Austronesian and Melanesian worlds, the distribution of semantic alignment is visibly skewed towards Wallacea (Map 13). Within Wallacea semantic alignment appears repeatedly in Papuan and Austronesian languages around Yapen in Cenderwasih Bay and North Halmahera, before continuing into the Austronesian languages of central and eastern Maluku (Aru and Banda) where it is robustly displayed. In southern Maluku it occurs sporadically (Selaru and Luang), and subsequently disappears until reaching central Timor. Here it reappears in Bunaq and then is continued on in the related languages of Alor and Pantar. From there it extends westward through the Austronesian

languages of the Solor Archipelago (Kedang, Lamalera, Lamaholot) and then ends in Sumba (Kambera). Outside of Wallacea there is a much more limited occurrence. To the west, there are only three Austronesian outliers, Acehnese, Nias and Mori Bawah. To the east, there are a collection of Papuan languages showing the feature, two Torricelli languages in northern New Guinea, Kewa in the eastern highlands, Anem-Ata of West New Britain, the Baining languages of East New Britain, two languages of north Bougainville, and Lavukaleve in the southeast Solomons. Despite its recurrence to the east, semantic alignment is unmistakably an areal feature of Wallacea (pace Donohue 2004, contra Klamer 2008b) because of its repeated occurrence in Austronesian languages bordering on Papuan languages showing similar systems. Elsewhere we do not find such cross-familial occurrences.

Amongst the Austronesian languages of Wallacea, the person marking forms themselves are so diverse that they cannot easily be seen to originate in a single ancestral language (Adelaar 2005: 25, Donohue and Grimes 2008). The nature of the semantic alignment in the different Austronesian languages is also varied. For example, in Batuley (as in other Aru languages) there is a strictly lexicalised stative-active split: stative (intransitive) verbs have their subject indexed by a suffix (19a), while active (intransitive or transitive) verbs have their subject indexed by a prefix (19b); no verb can move from its assigned class.

Batuley (Austronesian, Aru Islands, Indonesia; Daigle 2015)

(19)   a.   *Karaw-**ing***.
                 thirsty-1SG
                 "I am thirsty."

         b.   *Ang*   ***ku-**fan*   *fei*   *kai*   *tutui*.
                 1SG   1SG-fall from   tree   top
                 "I fell from the top of the tree."

By contrast, Kambera has a so-called "fluid-S" (Dixon 1994) split whereby the subject of an intransitive verb can be marked by different agreement clitic combinations, each expressing different semantic nuances. Compare the clitic marking on the verb *meti* in (20). In (20a) the subject of *meti* is encoded with the proclitic *da=*, a marking pattern that does not force a specific interpretation of the clause. However, in (20b) and (20c) the subject is encoded with the enclitic *=na* and *=ya* respectively, each carrying different mood, modality and aspectual connotations (see Klamer 1998 for discussion).
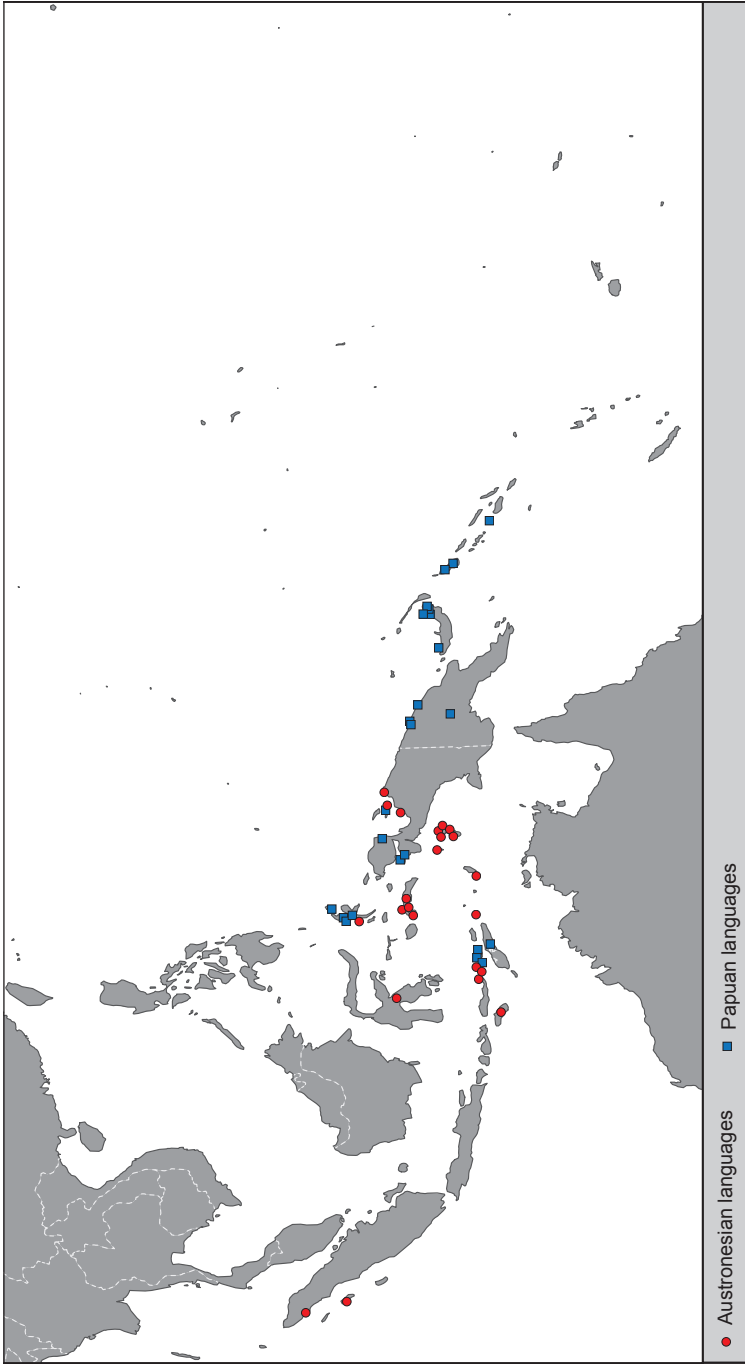
Map 13 – Semantic alignment in Austronesian and Papuan languages. (Infography: © L. Billault, IRD)

This map presents 58 languages, 26 Austronesian and 32 Papuan languages with semantic alignment. It builds on the argumentation of Donohue (2004) and synthesises data from Donohue (2004, 2008a), Ewing (2010), Holton (2008), Klamer (2008a, 2008b), Schapper (2014, 2015), Siewierska (2013) and Taber (1999).

Kambera (Austronesian, Sumba Island, Indonesia; Klamer 1998)

(20) a.   *Jaka   nda   nyumu,   da=meti=ka   làti.*
           CONJ   NEG   you   3PL=die=PFV   in.fact
           "Without you, they would die/they would have died."

      b.   *Mbada meti=na=ka?*
           already die=3SG=PFV
           "Is he dead already/has he died already?"

      c.   *Jaka   nda   nyumu, meti=ya=ka   làti.*
           CONJ   NEG   you   die=3SG=PFV   in.fact
           "Without you, one (generic) would die/have died."

   Such formal variety suggests that the appearance of semantic alignment in Austronesian languages in the region is the result of erratic diffusion. By contrast, as Donohue (2004 : 231-233) argues, semantic alignment appears to be an inherited trait in the Papuan families of Wallacea, which Austronesian languages in the region acquired either through substratum or contact.

Neuter Gender

   Across Wallacea, strongly semantic gender distinctions between neuter and nonneuter are commonplace (Map 14). The terms "neuter" and "nonneuter" refer here to gender categories in which there is a binary division of referents into classes according to their position on the animacy hierarchy. "Neuter" defines a class of referents lower on the animacy hierarchy (e.g., nonmale, nonhuman, inanimate), while "nonneuter" defines a class of referents higher up the scale (e.g., male, human, animate). For instance, in Maybrat, MALE (nonneuter) contrasts with NON-MALE (neuter), marked by different verbal prefixes *y-* (21a) and *m-* (21b and 21c) respectively. Similary, Tobelo contrasts HUMAN (nonneuter) with NON-HUMAN (neuter) by means of *yo-* (22a) and *i-* (22b) respectively.

Maybrat (Papuan, isolate, Bird's Head, Indonesia; Dol 2007)

(21) a.   *Y-amo   amah.*
           3.MALE-go   house
           "He goes into the house."

      b.   *Fnia   m-amo   aya.*
           woman 3.NMALE-go   water
           "The woman goes to the river."

      c.   *T-tu   aya   m-amo   cerek.*
           1SG-pour   water 3.NMALE-go   thermos
           "I pour water (making it go) into the thermos glass."

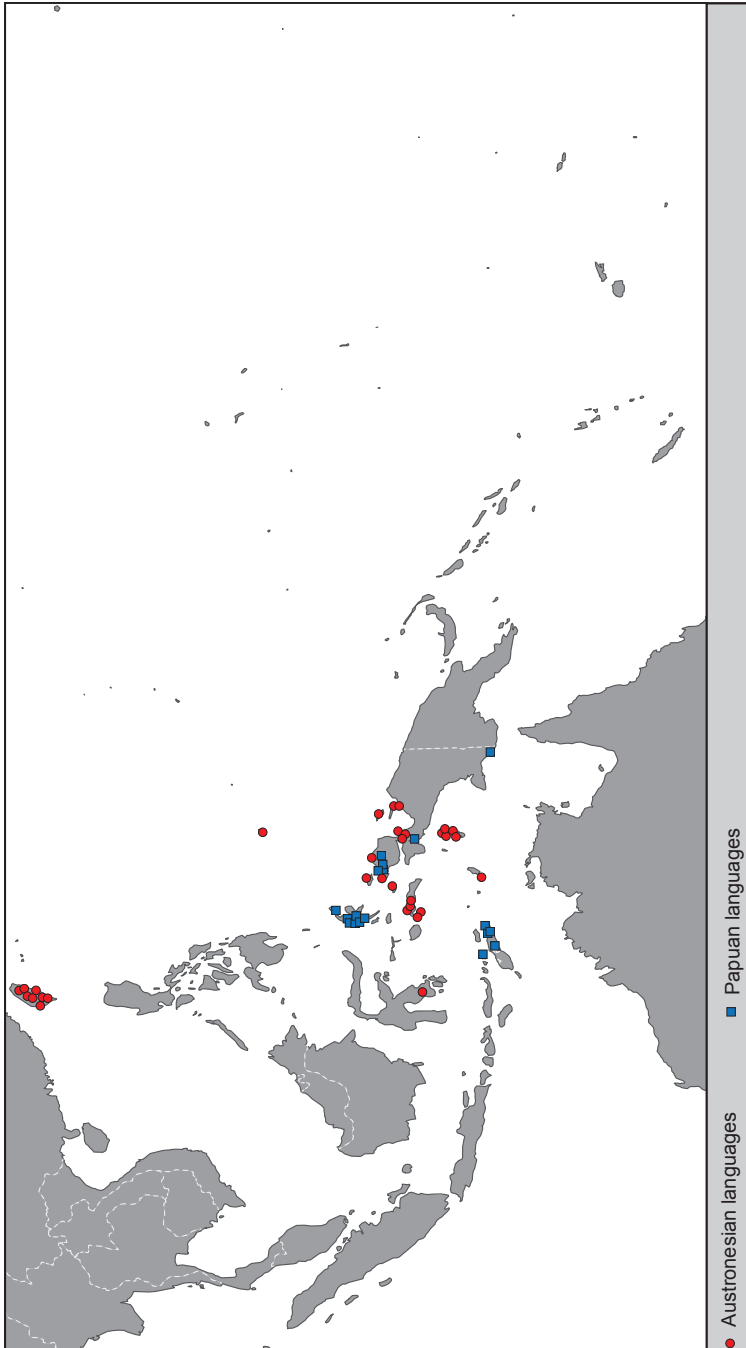Tobelo (Papuan, North Halmahera, Maluku, Indonesia; Holton 2003)

(22)   a.   ***Yo**-honenge.*
            3PL.HUM-die
            "They [human] died."

       b.   ***I**-honenge.*
            3.NHUM-die
            "It/they [non-human] died."

Since such neuter gender distinctions are not typical of either Papuan or Austronesian languages across the board, the limited overall distribution can only be taken to represent an areal feature of Wallacean languages (Schapper 2010). Only four outliers are recorded: (i) the Formosan (Austronesian) languages with their human-nonhuman distinction marked on numerals (this is an inherited feature in these languages and thus is taken to constitute only one instance of the feature); (ii) Palauan (Austronesian) in Micronesia which has a human-nonhuman distinction in its pronouns; (iii) Tolaki (Austronesian) in Sulawesi which has a human-nonhuman distinction in numerous parts of its grammar, given the proximity of Tolaki to Linguistic Wallacea, this may represent "leakage" from the area, and; (iv) Kanum (Papuan) in Southern New Guinea which has an female-nonfemale agreement distinction.

The area in which neuter gender is found begins with the Papuan languages of the western and northern Bird's Head (Abun, Maybrat, Moi and Tehit) and Mairasi of the Birds Neck, extending west to the Papuan languages of the North Halmahera family and south to the Papuan languages of the Timor-Alor-Pantar family. Neuter gender in the Austronesian languages of Wallacea connects the disparate Papuan families together: the feature extends around the top of the Bird's Head from languages such as Biak, Dusner and Waropen in Cenderwasih Bay to northern Maluku islands at the New Guinea beachhead in languages such as Matbat and Ambel of the Raja Ampat islands; from here it is attested broadly throughout Central Maluku, pervades the Aru languages and appears sporadically in the languages of southwest Maluku (e.g., Selaru) before halting in eastern Timor (Naueti), where Papuan languages with similar systems are found.

It might be thought that the appearance of such systems in many Austronesian languages could represent shared inheritance. However, the forms marking the neuter/non-neuter gender distinction in the different languages cannot be reconciled as being part of a single innovation such as would characterize a sole ancestral proto-language. Compare, for instance, the subject agreement markers for neuter gender in Ujir (23) and Ambel (24). While Ujir only makes a neuter gender distinct in the plural, Ambel makes it in the singular as well. While Ujir *-si* and Ambel *si-* are both clear reflexes of the Proto-Malayo-Polynesian 3rd person plural pronoun *sida (Ross 2006),

they are likely to represent separate grammaticalisation events and are not due to common inheritance. This is particularly clear when we take into account the fact that Ujir uses suffixes on the verb, while Ambel uses prefixes, that the look-alike forms do not mark the same gender (animate in Ujir versus inanimate in Ambel), and that the other agreement forms that they occur in a paradigm with cannot be seen as having any shared inheritance.

Ujir (Austronesian, Aru Islands, Indonesia; own fieldnotes)

(23)   a.   *Tamata bangi-si.*
                person big-3PL.AN
                "The people are big."

        b.   *Juma   bangi-di.*
                house   big-3PL.INAN
                "The houses are big."

Ambel (Austronesian, Waigeo Island, Indonesia; Laura Arnold pers. comm.)

(24)   a.   *N-amdol.*   b.   *L-amdol.*
                3SG.AN-fall   3PL.AN-fall
                "S/he falls."   "They fall."

        c.   *An-amdol.*   d.   *Si-amdol.*
                3SG.INAN-fall   3PL.INAN-fall
                "It falls."   "They [inanimate] fall."

    In short, the sporadic appearance of the gender distinction, the diversity of morpho-syntactic targets on which the distinction is marked, and the lack of uniformity in the forms expressing the distinction all point to neuter gender as having independently emerged multiple times in the Austronesian languages of Wallacea.
    Across the Papuan languages too, neuter gender distinctions take very different forms and appear to differ in their antiquity in the various groups. In the North Halmahera languages, for instance, the non-human gender form in the plural goes back to the shared ancestor, Proto-North Halmahera (Donohue 2008b). By contrast, in the Timor-Alor-Pantar languages, neuter gender appears in only a few languages and then in very different forms: on demonstratives in Bunaq (25); on verbal prefixes in Abui (26), and on some numeral and quantifying verb forms in Eastern Timor languages (exemplified on the basis of Makalero in 27).

Bunaq (Papuan, TAP, Timor, Indonesia/Timor-Leste; own fieldnotes)

(25)   a.   *en   **bari***   b.   *zo   **bare***
                person this.AN   mango this.INAN
                "this person"   "this mango"

Map 14 – Neuter gender in Austronesian and Papuan languages. (Infography: © L. Billault, IRD)

This map presents 48 languages, 30 Austronesian and 18 Papuan languages with neuter gender agreement in at least one domain. It builds on Schapper (2010) and Schapper (2015), using additional data for Kanum and Tolaki (Mark Donohue pers. comm.), West Tarangan (Rick Nivens pers. comm.), Batuley (Daigle 2015), Naueti (Veloso in preparation), Fataluku (van Engelenhoven pers. comm.), Makalero and Makasae (Huber 2011), Dusner (Dalrymple & Mofu 2012), and Formosan languages (Li 2006).

Abui Atengmelang (Papuan, TAP, Alor, Indonesia; Kratochvíl pers. comm.)

(26) a. *da fokung ha-nei*   *Mangrawali ha-rul-i*   *mi*
          3   gong   3.POSS-name   M.   3-take.off-PFV   take
          ***he**-tan-i.*
          3.HUM-release.PFV-PFV
          "He took off the gong named Mangrawali and gave it to them."

      b. *ha-táng*   *baai*   ***we**-ong!*
          3.POSS-hand   also   3.NHUM-make
          "Make his hands also."

Makalero (Papuan, TAP, Timor, Timor-Leste; Huber 2011)

(27) a. *amuni*   *ki=**rial***   b. *dila*   *ki=**roual**=ini*
          person   ATTR=many.HUM   frog   ATTR=many.NHUM=ART
          "many people."   "the many frogs."

   Such patchy, disconnected appearances of neuter gender in the TAP languages,
as well as in the Austronesian languages in southern Wallacea contrasts with the
proliferation of instances on and around the Bird's Head. With this, that the
Bird's Head also shows the greatest genetic diversity in languages with neuter
gender goes to suggest that neuter gender in Wallacea has the Bird's Head as
the centre of feature's dispersal, and that the gender distinction in Austronesian
languages is ultimately due from (a) Papuan source(s).

#**muku** *"banana"*

   Looking at words for "banana" across the Austronesian and Melanesian area (as
done by Donohue & Denham 2009, Denham & Donohue 2009), the form #muku
has a striking skewing towards Wallacea (Map 15).[12] Of the 66 languages reflecting
the term, only 12 occur outside of Wallacea, 8 Austronesian and 4 from the Papuan
Yareban family. Within Wallacea the term is found not only in Austronesian
languages but also in four distinct Papuan families. The Wallacean distribution
of #muku reflexes begins in Papuan languages at the western extremes of New
Guinea in Tehit (West Bird's Head family) of the Bird's Head, Mor (isolate) of
the north Bomberai Peninsula, and Iha and Baham (West Bomberai) further to the
south on the Bomberai Peninsula. From there Austronesian languages reflecting
*muku are spread south-west through Maluku connecting New Guinea to the
Timor area, where Papuan languages of the Timor-Alor-Pantar family are found

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12. Here I use # to mark a word that is not a reconstruction, but rather a generalization across
forms in an etyma set that crosses language family/subgroup boundaries. * is reserved for words
that are truly reconstructable to a proto-language on the basis of the Comparative Method.

with *muku. The distribution of #muku reflexes continues sporadically throughout Timor (being found in three languages of central Timor, Tokodede, Kemak and Mambae) and then continues through Sawu and Sumba before finishing in Flores and the languages of the Solor archipelago.

Various scenarios could be used to explain the presence of this banana term in the languages. Chance similarity is typical of sporadic lookalikes in far flung languages. In the case of #muku such an explanation is extremely unlikely given that we are dealing here with dozens of instances of a word in a single region. Shared inheritance, whereby languages have inherited the word from a shared ancestor, can also be dismissed as we know for certain that not all the languages involved are related. That leaves borrowing, either between languages or from some external source. As Denham and Donohue (2009) argue, "given that [#]muku does not occur in Austronesian languages away from the area of Papuan contact, a Papuan source can be deduced." This reasoning is supported by the recent reconstruction of *mugu(l) to Proto-Timor-Alor-Pantar, the shared ancestor of the Papuan languages in the southeast corner of Wallacea (28 presents reflexes in modern TAP languages).

Reflexes of Proto-Timor-Alor-Pantar *mugu(l) "banana" (Schapper et al. 2014)

(28)   Bunaq *mok*; Makasae *muʔu*; Makasae *muʔu*; Fataluku *muʔu*; Oirata *muː*; West
         Pantar *magːi*; Teiwa *muħui*; Kaera *mogoi*; Blagar *mol*; Adang *mɔʔɔi*; Klon *məgol*;
         Kamang *moːi*; Wersing *mulul*; Sawila *maːka*.

Since the breakup of proto-Timor-Alor-Pantar, the language from which all the Papuan languages of southeast Indonesia originate, predates the Austronesian arrival in the region (Schapper 2011b: 182), the reconstruction of this banana term points to it being a very old feature within Wallacea and not one dispersed relatively recently through Austronesian languages. This is confirmed by the early appearance of the term in Austronesian subgroups in the region. For instance, *muku reconstructs to the Proto-Aru subgroup of the Austronesian family (Rick Nivens pers. comm.). The appearance of #muku reflexes in three other Papuan groups in Wallacea confirms the early dispersal of the term and further points to Wallacea, as the region not only of the most appearances but also of greatest genetic diversity for the term's coverage, being its centre of dispersal.
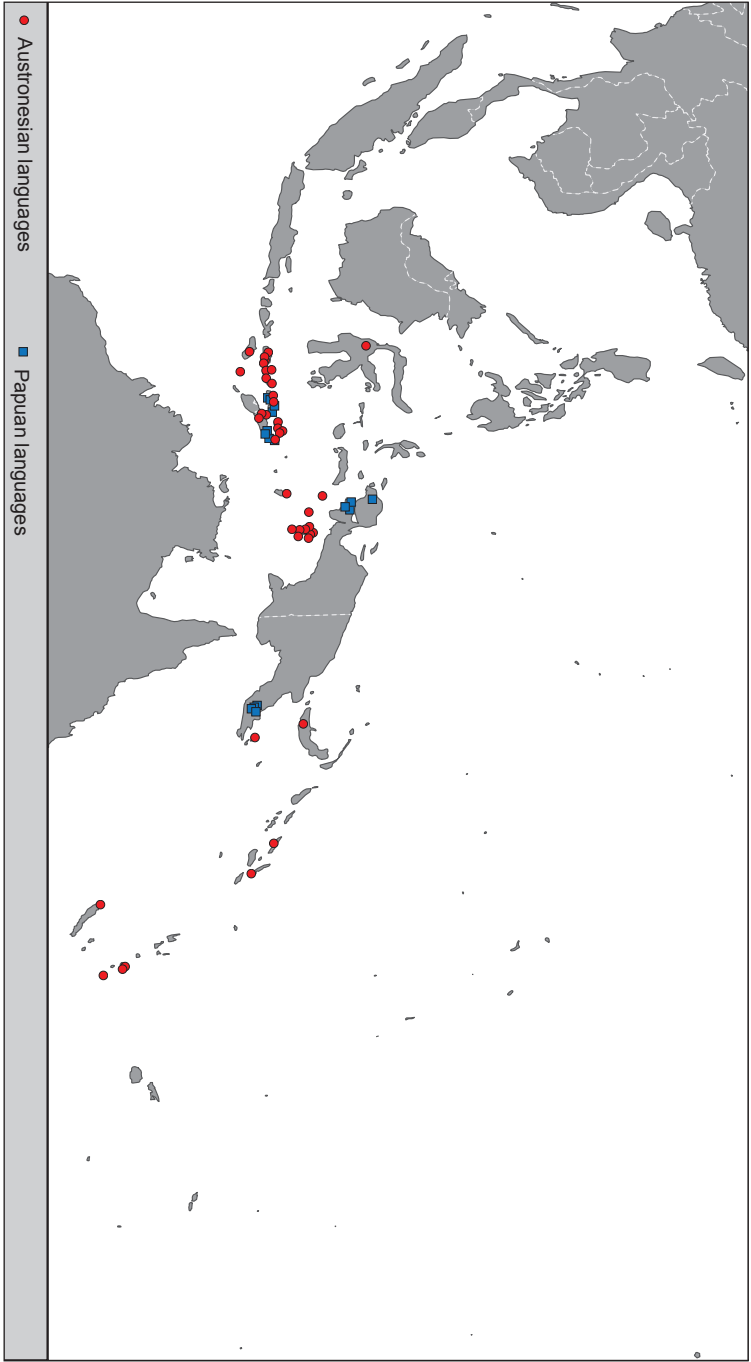
Map 15 – Reflexes of #muku in Austronesian and Papuan languages. (Infography: © L. Billault, IRD)

This map presents 66 languages, 43 Austronesian and 23 Papuan languages with a reflex of #muku 'banana'. It and the argumentation for this feature are based on Donohue & Denham (2009) and Denham & Donohue (2009); their work is supplemented with data corrections to the TAP languages (see 24) and additional data from Tokodede (own fieldnotes).

Legend: Austronesian languages ●　Papuan languages ■

Synchronic Metathesis

Synchronic metathesis refers to a process whereby the expected linear ordering of sounds in a word is reversed in certain morphosyntactic environments, thus, xy becomes yx.[13] In our analysis there are two kinds of metathesis, internal and external. Internal metathesis involves an alternation of two segments within a word's root, as illustrated by the final versus non-final forms of Helong "smile" in (29). External metathesis involves an alternation of two segments across the morpheme boundary between an affix and the root to which it attaches, as illustrated with Selaru "dog" in (30).

Helong (Austronesian, West Timor, Indonesia; Bowden 2010)

(29)   a.   *Auk*   *mali*.
            1SG   smile
            "I smile"
            Auk   *mail*   *lahin*.
            1SG   smile   yesterday
            "I smiled yesterday."

Selaru (Austronesian, Tanimbar, Indonesia; Coward 1990)

(30)   a.   *asw*
            dog
            "dog"
            askwe
            asw   -ke
            dog-ART
            "the dog."

Crosslinguistically, synchronic metathesis is a highly unusual process and accordingly has attracted much theoretical attention to the Wallacean languages which display it most robustly.

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13. Note that synchronic metathesis as intended here does not include allomorphy whereby an affix CV becomes VC with certain root shapes. This excludes metathesizing allomorphy such as affects enclitics in Makalero (Huber 2011) or suffixes in Dobel (Hughes 2000). Furthermore, differences between dialects such as described for Biak (van den Heuvel 2006: 57) are not conditioned by morphosyntax in any way and are essentially instances of language change. These are also excluded. As the criticisms of Donohue (2004) reveal, Klamer's (2002) characterisation of metathesis was not sufficiently constrained or well-defined to be taken to constitute an areal feature.
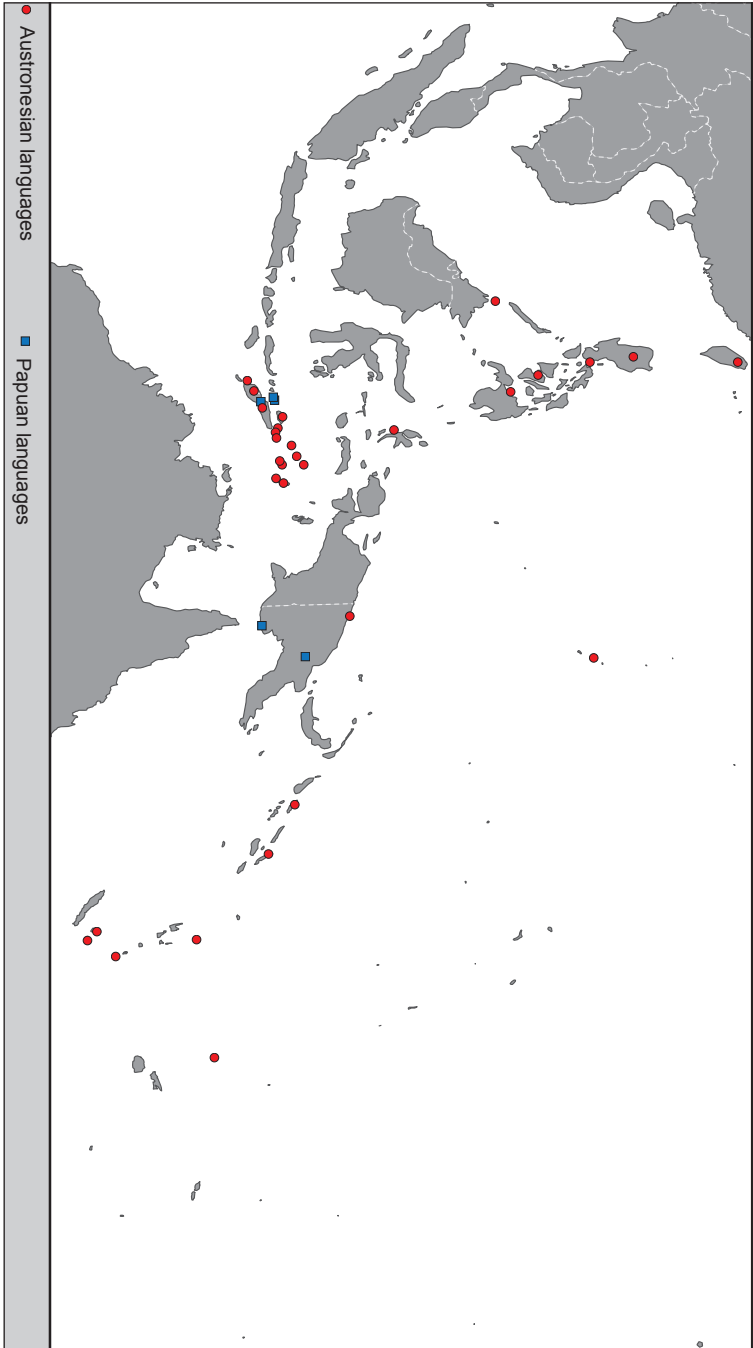
Map 16 – Synchronic metathesis in Austronesian and Papuan languages. (Infography: © L. Billault, IRD)

This map presents 36 languages, 31 Austronesian and 5 Papuan languages with synchronic metathesis. It synthesises Bodegraven & Bodegraven (2005), Bowden (2010), Chlenov & Chlenova (2008), Chlenova (2002), Engelenhoven (2003), Hume (2015), James (1994), Laycock (1982), Steinhauer (2008, 2009), Windschuttel & Shiohara (forthcoming), and my own fieldnotes for Bunaq and Wersing.

- Austronesian languages
- Papuan languages

Both kinds of metathesis, often in one and the same language, are found in many languages in the southeast corner of Wallacea (Map 16). The greatest concentration of metathesising languages lies in the islands just east of Timor. From here, the feature continues north and west, occurring sporadically in the languages of Tanimbar (see Selaru data in example 26) and Babar as well as western and central Timor (see Helong data in example 29) and Alor. Metathesis outliers are also found scattered through Austronesian languages in the islands to the east of New Guinea, and in several languages of Formosa and the Philippines. Only two Papuan outliers are known, Siane and Gizrra, in eastern New Guinea, both away from Austronesian contact. Due to its areally limited appearance within Wallacea, metathesis is certainly the weakest feature of Linguistic Wallacea in this characterisation. Nonetheless, it can legitimately be regarded as a circum-Timor areal feature due to the density of its occurrences and the fact that it crosses the Papuan-Austronesian divide. In no other region of Austronesia and Melanesia do we find anything like the concentration of metathesising languages as in southeast Wallacea, nor do we find any other region in which Papuan and Austronesian languages both show the feature.

Although it is likely to be inherited in form and function on some low levels (e.g., amongst the Kisar-Luang languages, Engelenhoven 1995), inheritance cannot be used to explain all the appearances of metathesis in the Austronesian languages within Wallacea. Mambae, for instance, is a metathesising language: many nouns and verbs have two forms, a vowel-final and a consonant-final form, the latter appear in phrase-final and the former in non-final position, as illustrated with "rope" in (31).

Mambae (Austronesian, central Timor, Timor-Leste; own fieldnotes)

(31)   a.   *kud*   **tali**
                horse   rope
                "bridle" (lit. "horse rope")

       b.   **tail**   *mata*
                rope   eye
                "trap" (lit. "rope eye")

However, neither of Mambae's nearest relatives, Kemak or Tokodede, have synchronic metathesis. In fact, the closest common ancestor that Mambae shares with other metathesising languages is Central-Malayo-Polynesian (if we accept the existence of this node). This means that we would need to reconstruct metathesis as a productive process back to PCMP, including the very many languages of Maluku and from Flores to Sumbawa that show no trace of this process having been in effect.[14] Thus, areal diffusion provides a

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14. Metathesis may have been a productive process in more languages in the region in the past.

much simpler account of the distribution of metathesis in the region.

   This is particularly so when we take into account the feature's appearance in three distinct Papuan languages of the Timor-Alor-Pantar family. Similarly, here inheritance cannot be used to explain the scattered appearance of metathesis, as the languages display distinct patterns. Compare the following. In Bunaq, metathesis is triggered by prefixation of roots with the shape CV_1V_2C where the first vowel is /i/ or /u/, as illustrated in (32). In Wersing metathesis is associated with suffixation or encliticisation onto roots with the shape CV_1CV_2 where the final vowel is /i/ or /u/, as illustrated in (29).

Bunaq (Papuan, TAP, Timor, Indonesia/Timor-Leste; own fieldnotes)

(32)   a.   ***sieʔ***   b.   ***g-iseʔ***
            rip   3AN-rip
            "rip (it inanimate)"   "rip (him/her/it animate)"

Wersing (Papuan, TAP, Alor, Indonesia; own fieldnotes)

(33)   a.   *ge-**tati***   b.   *ge-**tait**-a*
            3-stand   3-stand -REAL
            "(s/he) stands"   "(s/he) is really standing"

   In short, synchronic metathesis must be taken as an areal feature within Wallacea, albeit one with a limited distribution.

Summary

   In the preceding pages I have demonstrated the existence of a Wallacean Linguistic Area characterized by four distinguishing linguistic features (Map 17). This area, whilst contained within the western extremity of the Melanesian Linguistic Area, must be viewed as a distinctive area in its own right in which proximal Austronesian and Papuan languages share a set of distinctive properties in common to the exclusion of neighbouring regions to the west and east.

   Taken together, the features that I have discussed as defining the Wallacean language area have the region half way between the Bird's Head and Timor as their geographical centre. At the peripheries are Flores and Sumba in the south

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Blust (2012) shows that vowel metathesis has made changes throughout the Sabu language and this may trace back to a once productive pattern. Its location between Timor and Sumba indeed puts Sabu in a likely position to feel the effects of an areal pattern emanating from Timor. Kula and Sawila on Alor have final-nonfinal word shape alternations which are highly reminiscent of the syntactic conditions governing metathesis in languages such as Leti and Uab Meto. The formal properties of the shape alternations also are indicative of fossilised metathesis processes. The infixation of 3rd person high-vowel agreement markers that is widespread in Aru and Cenderawasih Bay may also be a historical remnant of a once more productive metathesis process (see Gasser 2015).

and Halmahera and Cenderawasih Bay in the north. The extent of Linguistic Wallacea thus closely corresponds to the modern dispersal of Papuan outliers around western New Guinea and speaks to them as the origin of the area. This point shall be discussed further in what follows.
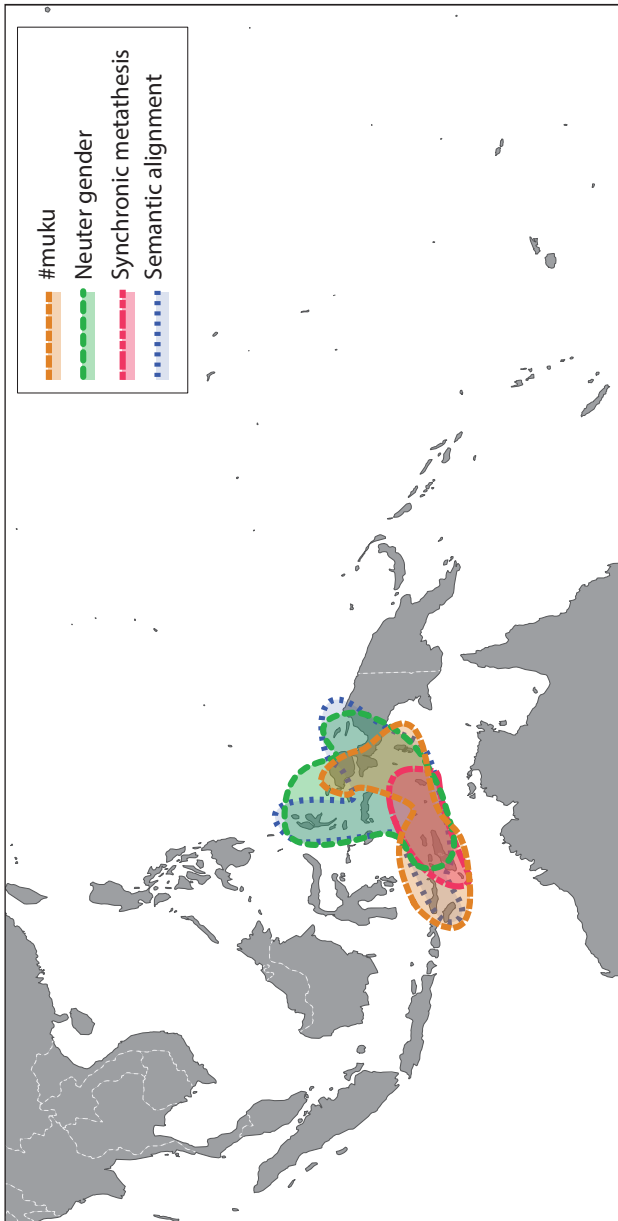
Map 17 – Linguistic features viewed together within Wallacea. (Infography: © L. Billault, IRD)

Prehistorical Inferences from Linguistic Wallacea

The presence of each of the features that we have discussed across Wallacean languages can in theory be explained in one of three ways: (i) chance similarity, the features are the outcomes of independent parallel innovations in the various Wallacean languages; (ii) shared inheritance, the features were present in some inter-stage language from which Wallacean languages are all descended; or (iii) borrowing, features being copied from one Wallacean language to another.

As we have seen in the discussion of individual features in the preceding sections, the first of these scenarios can be ruled out as extremely unlikely. In the case of semantic alignment and synchronic metathesis, this is because the features are relatively rare crosslinguistically, both generally in the world's languages and specifically within the Southeast Asian region. Neuter gender is similarly marked because gender is not a typical feature of either Papuan or Austronesian languages. Finally, in the case of #muku, the sheer concentration of lookalikes in such a circumscribed area speaks against chance similarity.

Shared inheritance cannot be the primary explanation since we know that the languages involved are from different families. Still, it could be speculated that the Wallacean features were copied from a long dead Papuan language into an ancestral Austronesian language from which all modern Austronesian languages in Wallacea descend. However, this scenario still would not explain what we observe among the Austronesian languages. Firstly, given that the postulated CEMP and CMP subgroups of the Austronesian tree are disputed, it is tenuous to say that all the Austronesian languages in the region belong to a single subgroup. Secondly, the differential appearance of Wallacean features makes a purely genetic explanation for them highly problematic. Moreover, the diverse forms that the features take make it impossible to reconstruct the features back to a single proto-language of the Austronesian tree.

The third explanation would be to say that the features have been borrowed from language to language, either through contact or substrate. Borrowing fits the pattern of erratic diffusion that Wallacean features have in the Austronesian languages of the area. That the features often, as we have seen, appear to have some antiquity within small, low-level subgroupings of Austronesian languages, points to early adoption into the Austronesian languages from a Papuan substrate(s) present over the Wallacean area.

Whilst this model deals with the appearance of Wallacean features in Austronesian language, an explanation remains to be found for their being shared across multiple unrelated, non-contiguous Papuan families. Some Wallacean features reconstruct to the proto-languages of some Papuan groups in the region. This early presence means that the features cannot have been transferred from Papuan to Papuan group by Austronesian languages, as the breakup of the Papuan families most likely predates the Austronesian arrival.

So how did features become shared across Papuan groups at the peripheries of Wallacea, when they are broken up by intervening Austronesian groups?

The obvious answer is that Wallacea is in fact an ancient linguistic area that was in existence before the Austronesian arrival. The problem with this is it does not accord with the conventional understanding of the prehistory of the region which, according to Bellwood (1997, 1998, 2006) and traditionally adopted by others was home only to sparse populations of simple hunter-gatherers prior to their being overwhelmed by expanding groups of farming Austronesians. The Wallacean linguistic area extends over a large archipelago of islands and thus can only have come into existence in the presence of a pre-Austronesian maritime culture connecting disparate speaker groups.

Archaeological Correlates of Wallacea

The existence of Wallacea as a linguistic area is predicated on linguistic patterns observed in modern languages, but it is obviously the product of historical processes that have been played out over a long period by humans in interaction with one another. That means that if Wallacea did exist as a pre-Austronesian maritime culture, we should also find it reflected in the archaeological record. And indeed, whilst the traditional large-scale models of Island Southeast Asia have not been sensitive to it, archaeological work within Wallacea has increasingly eschewed the pre-Austronesian stereotype; the Papuan late Pleistocene is no longer viewed as necessarily a time of stasis in which economically simple hunter-gatherers were sparsely spread in contrast to the Austronesian Holocene as the time of rapid agriculturalization and technological change. Instead archaeology is progressively bearing out the conclusions we have drawn from the histories embedded in the languages of Wallacea.

The existence of a pre-Austronesian seagoing society in Wallacea has been inferred from pelagic fish hook finds in eastern Timor dated to at least 5000 years before the Austronesian expansion (O'Connor & Veth 2005). Long-distance connections in the pre-Austronesian period are also strongly indicated by shared rock art designs across Wallacea. Striking similarities between eastern Timor and the Bomberai Peninsula have been observed in the motifs of rock art (Arifin and Delanghe 2004: 144, O'Connor 2003, this volume), the earliest dated to between 29300 BP and 24000 BP (Aubert et al. 2007: 995). Pre-Austronesian interactions between mainland New Guinea and island Wallacea can further be inferred from the westward movement of marsupials in the early and mid Holocene (Heinsohn 2010); remains of *Phalanger orientalis* appear punctually in the archaeological record of Timor from circa 5000 BP (Glover 1986, O'Connor this volume). Obsidian transfers beginning from 13000 BP into Timor from elsewhere in Island Southeast Asia further witness the existence of inter-island trading networks before the Austronesian arrival in

the region (Ambrose et al. 2009, Reepmeyer et al. 2011).[15]

What is more, far from the putative hunter-gatherers of the conventional literature, the pre-Austronesian inhabitants of Wallacea also appear to have been agriculturalists (see Latinis' 2000 characterisation of Wallacean arboriculture). In Timor there are signs of domesticated taro (*Colocasia esculenta*) cultivation from 10000 BP (Oliveira 2008: 387). Archaeobotanical evidence for the domestication of bananas in New Guinea and the movements of cultivars into Timor, Flores and then beyond has been dated to 4500 BP, thus preceding the arrival of Austronesians in Wallacea (Donohue & Denham 2009, Denham & Donohue 2009).

The strong archaeological evidence which exists for extensive pre-Autronesian inter-island contacts in Wallacea, and for pre-Austronesian taro and banana cultivation in the same area, supports the inferences drawn in this paper regarding the formation of Linguistic Wallacea.

Conclusion

By contextualising the areal features of the languages of Wallacea in terms of patterns found to the east as well as to the west of that area, this paper has provided a rigorous definition of Wallacea as a linguistic area. In linguistic terms as in biogeography, Wallacea lies at the crossroads of the Austronesian and Melanesian worlds, with its languages showing progressively more Melanesian features the closer to New Guinea they are spoken. However, the occurrence of Papuan features in Austronesian languages is not in itself limited to Wallacea. It also characterizes a much wider zone, referred to here as "Linguistic Melanesia," which extends further east through New Guinea and out into the Pacific.

What defines Linguistic Wallacea as such is a set of shared features more specific than those which characterize Linguistic Melanesia. These are, minimally: (i) semantic alignment, (ii) neuter gender, (iii) synchronic metathesis, and (iv) the occurrence of #muku "banana." Previous attempts to define a Wallacean linguistic area under other names ("Eastern Indonesia," "East Nusantara") have erroneously included features which in fact define Linguistic Melanesia as a whole.

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15. The presence of seafaring abilities is further corroborated by Sunda-Sahul migrations during the Pleistocene, which required knowledge of sea currents, favorable winds and inter-island visibility patterns (Allen 1996, Irwin 1992, O'Connell et al. 2010).

The Wallacean features show signs of antiquity, and the fact that they are shared across unrelated and non-contiguous Papuan language families indicates that their origins lie in a period prior to the Austronesian language dispersal, among communities which spoke Papuan languages and were involved in sustained seaborne interaction across Wallacea. The wide and evidently early dispersal of #muku "banana" suggests that these communities also practiced agriculture. Archaeological evidence exists to support the proposition advanced here that in pre-Austronesian times, Wallacea was already inhabited by seafaring, agricultural peoples.

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