How Crow-Omaha Skewing Spreads

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Crow-Omaha kinship systems skew kin terms intergenerationally. Although occurring worldwide, they are relatively infrequent and often exist in historically unrelated clusters: "similar inventions in areas widely apart" (per Boas). Most analyses have been formalist, evolutionist, or sociological. Here, adding some historical linguistics and focusing on the core kin-term equations via the ethnographic and ethnohistoric record of Indigenous Australia and North America, we examine how these systems arise and spread among near neighbors, and across language-family boundaries. We address comparative dynamics, sociological and linguistic, of distribution patterns over time and space. We suggest that skewing, as a social technology that enhances matrilineal-matrilocal (Crow) and patrilineal-patrilocal (Omaha) systems (with some similar and other converse patterns), confers advantages over systems with "crossness" of "Iroquois" or "Dravidian" type in circumstances of demographic stress. We affirm the key to skewing lies in its dispersal of affinal alliance beyond binary exchange and suggest some socio-evolutionary implications.

Key words: Kinship systems, structural dynamics, language spread, language histories, Crow-Omaha

The comparative study of kinship systems has reemerged in recent years, with some new and other revitalized approaches (e.g., Bamford 2019; Godelier 2011; Guillon and Mace 2016; Jones and Milicic 2011; Sahlins 2013; Shapiro 2018; Trautmann and Whiteley, eds. 2012). Crow-Omaha systems remain a "problem," with some doubting a solution is possible (Parkin 2019). Treating kinship systems as flexible social technologies—strategies used agentively for producing certain social outcomes—rather than fixed structural forms offers promise (Trautmann and Whiteley 2012b:290–93). In the first instance, however, kinship systems are nomenclatures, logically interrelated sets of relationship terms in particular languages (e.g., Read 2001). If social technology is to prove heuristic, understanding how nomenclatures operate and change over time is essential. Linguistic aspects are frequently omitted from formalist, evolutionist, and sociological explanations of kinship (Keen 2014). Both linguistic structures and ethnolinguistic communities have histories, including relationships with neighbors. Focusing on Indigenous Australia and North America, we address the emergence and spread

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of Crow and Omaha kin terms as social technologies in the context of expansion and interaction of ethnolinguistic groups.

BASIC PREMISES

Since Morgan's puzzlement at first encountering skewing among the Kaw in 1859, explanations have accumulated (McKinley 1971a; Trautmann and Whiteley 2012a). Necessarily abbreviated, we here interweave definitions and premises with some benchmark advances. Crow-Omaha nomenclatures are defined by lineal skewing: the same kin term is used for some kin types of different generations. Formal logic of these systems is neatly summarized by Lounsbury (1964b; Scheffler and Lounsbury 1971), with "equivalence rules" specifying how one term is "extended" from one generational position to another. The main "skewing rule" for Omaha extends MB to MBS, and for Crow FZ to FZD.[1] Genealogical mirror-images, Omaha skewing equations (MB=MBS) axially trace the mother's patriline, and Crow (FZ=FZD), the father's matriline. The "basic sex" of skewing, a defining structural characteristic, is thus male or female, respectively (Hammel 1965:126). Lounsbury (1964b) identified eight Crow-Omaha subtypes, which we mostly ignore here, as we also ignore empirical variations in specific cases (e.g., Barnes 1984, 2012). We focus rather on the two core equations. Kinship literature routinely describes kin types as genealogical positions ("FZD" etc.), but "classificatory" use of terms is frequent in empirical cases: to be clear, referents include both close and more distant genealogical kin.

Skewing occurs as an addition, or new type of equation, upon systems with crossness (Allen 2012:54; Trautmann 2012:31). Iroquois and Dravidian are the archetypal forms of crossness (Lowie's "bifurcate-merging"), differentiating kin as either *parallel* or *cross* depending on whether their link to Ego is via parent's same-sex (parallel) or opposite-sex (cross) sibling (Figure 1).[2] Parallel cousins (MZC, FBC) are equated with siblings and prohibited as marriage partners; cross-cousins (MBC, FZC) have distinct terms and are "prescribed" as marriage partners in Dravidian and often "preferred" in Iroquois systems. Crossness, per Viveiros de Castro (1998:354), "must be seen as a property derived from an alliance structure . . . it always carries a matrimonial implication, direct or indirect." In adding skewing, Crow-Omaha systems retain the G=//-c equation, but replace "X-c" with "uncle," "aunt," "nephew," and "niece" terms: for Omaha, MBC=MG and FZC=ZC; for Crow, FZC=FG and MBC=C. The "matrimonial implication" of "X-c" is thus obviated by the added equations, dispersing marriage pathways. Importantly, Kronenfeld (e.g., 2009) shows that in empirical cases skewing is often an "overlay" on a co-extant system, with each system used in different discourse contexts.

Although many unilineal systems lack skewing, skewed systems are virtually coterminous with unilineal descent: patrilineal, Omaha; matrilineal, Crow. In the *Ethnographic Atlas*, 89% of Omaha cases have patrilineal descent; 85.7% of Crow, matrilineal (McKinley 1971a:231). White (1939)—corroborated by Murdock (1949) and Driver and Massey (1957)—argued skewing developed as unilineal descent groups became stronger, an argument independently adduced for Australia by McConvell

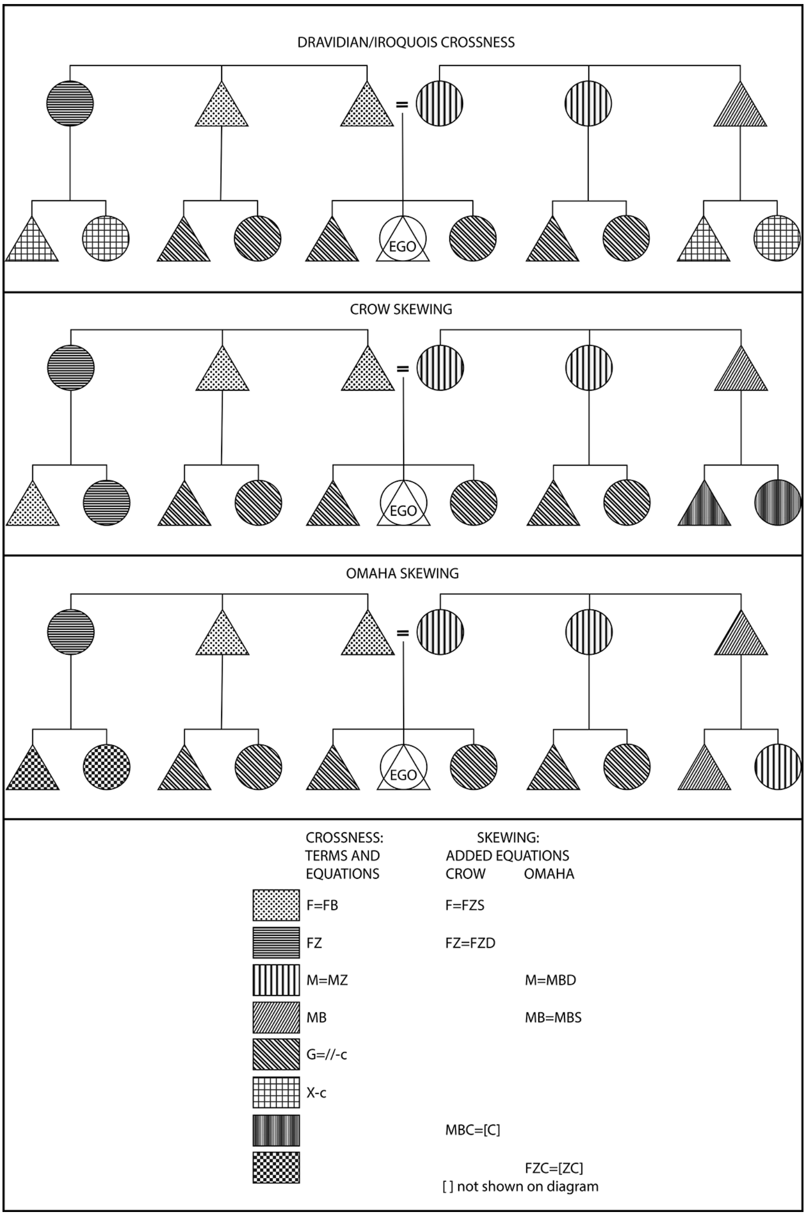

Figure 1. Skewing as additive to crossness, shown for G^0 and G^{+1}

(2012:256–57). Omaha also correlates closely with patrilocal residence, and Crow, with "those forms of residence most compatible with matrilineality, that is, matrilocal, avunculocal, or duolocal" (Dyen and Aberle 1974:91). As to alliance, an influential early argument attributed skewing to a *secondary* intergenerational marriage rule, combined with both levirate and sororate: WBD/FZH for Omaha, MBW/HZS for Crow (Lesser 1929; Lowie 1934; Rivers 1914). By mid-century that was refuted (Leach 1951:30; Lévi-Strauss 1949:444–58; Murdock 1949:123), and skewing was instead associated with a *primary* marriage rule: "AXCM," asymmetric (matrilateral) X-c marriage, i.e., of MBD with FZS (Eyde and Postal 1961; Lane and Lane 1959; Leach 1951; Lévi-Strauss 1949:450–55).

Subsequently, Lévi-Strauss (1966, 1969) divided forms of alliance covariant with skewing into two types: AXCM and "semi-complex." In prescribing marriage with one type of X-c, AXCM prohibits it with the (patrilateral) other (FZD-MBS; e.g., Parkin 2018:233). Semi-complex prohibits marriage with a range of cognatic kin: for example, at Hopi, with M's, F's, and MF's clan sets—in effect, "prescribing" marriage with any of the (6±) remaining clan sets. Both AXCM and semi-complex disperse alliance beyond direct exchange between binary descent lines such as moieties, which characterizes systems with crossness.[3] In AXCM, spouses are exchanged *indirectly* among a minimum of three exogamous lineages, A →B →C →A (e.g., Leach 1951). In semi-complex, repetition of an interlineage alliance is prohibited for a few generations (Héritier 1981; Parkin 2018:235). Lounsbury's (1964a) rediscovery[4] of a signal difference between Dravidian and Iroquois crossness enabled Trautmann (2012) to posit separate routes into skewing, concordant with the two marriage rules: Dravidian ↔ AXCM ↔ Crow-Omaha, where skewed systems occur nearby Dravidian, but no Iroquois are present; and Dravidian ↔ Iroquois ↔ Crow-Omaha (semi-complex), where Iroquois and Crow/Omaha cases are proximate with no intervening Dravidian neighbors.[5]

In short, Crow-Omaha skewing is typically part of a complex with unilineality, unilocal residence, and either AXCM or semi-complex alliance. Outside Australia, Crow-Omaha systems often occur in the mid-range of sociocultural integration—"tribes" and "chiefdoms" (Service 1975)—with relatively intensive adaptive strategies in competitive demographic environments (e.g., Dole 1972; Fox 1994; Schlee 2017). In Australia, with famously elaborate kinship systems but without "chiefdoms" or crop domestication, increased resource competition under demographic stress also accompanies systems with skewing (McConvell 2012). Globally, skewing often occurs near language and/or biogeographic boundaries and is often shared by neighbors speaking different languages, even as other near-neighbors of the same language groups lack skewing (Whiteley 2016).

Against this background, our hypothesis is that skewing spreads in one of two ways: (1) by the dispersal of *peoples* (migration), often along with their languages, and (2) by the dispersal of *systems* (cultural diffusion) without necessarily being accompanied by a spread of large numbers of people or of languages: such diffusions may either be of kin terms themselves *or* of their semantic patterns.

Focusing on the two core skewing equations vis-à-vis ethnolinguistic histories, social forms, and adaptive conditions, we seek to determine causes for patterns of spread, and differences, if any, between Omaha and Crow. In turn, we propose that spread patterns help explain the existence of Crow-Omaha systems. We begin in Australia, with McConvell's model of Omaha skewing, and then assess its implications for Crow-Omaha systems in North America.

SKEWING IN AUSTRALIA

Distribution patterns and dynamics of Omaha skewing are examined by McConvell (e.g., 2012, 2018; McConvell and Alpher 2002). Omaha cases (Figure 2) occur in North Kimberley, southeast Arnhem Land, Central Australia, Gulf of Carpentaria, and Cape York Peninsula. Crow skewing has recently been described for Yiwaidjan and Gunwinyguan language groups in and near coastal west Arnhem Land (Garde 2013:39–43; Harvey 2001), where, "while patrilineal institutions are present, matrilineal non-local clans or phratries and matrimoieties are present and are of considerable significance" (McConvell 2013:176). Being non-Pama-Nyungan, these language groups represent an earlier regional population stratum. They are separated from the (Pama-Nyungan) Omaha cases in eastern Arnhem Land and north-central Australia (to the south) by a bloc of Iroquois systems. Social operation of Crow skewing is little known, so it is not presented further here, but these cases notably occur in resource-rich areas (see Discussion).

McConvell (2012:256–57; McConvell and Alpher 2002) demonstrates that Omaha skewing is caused by "downstream" migration or "encroaching," where one language group "moves in on" other groups in response to demographic stress. This entails "access to better resources in the area, in a process usually involving intermarriage and language shift by the resident group to the language of the incoming group" (McConvell 2012:257). Many Australian cases conform to Kronenfeld's overlay model (in Figure 2, crescents denote overlay skewing), in which skewing is mobilized only in certain discourse

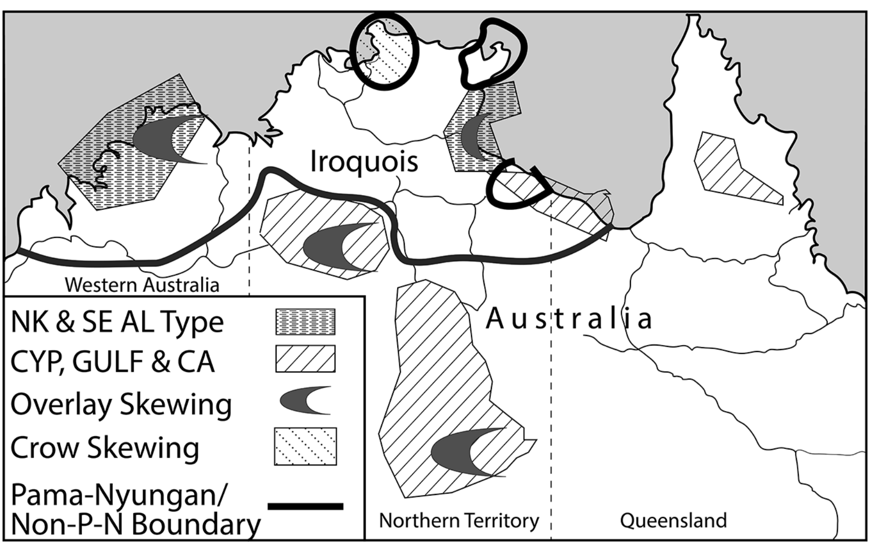

Figure 2. Omaha (and Crow) skewing in Australia.

contexts to emphasize solidarity of descent lines, as when inheritance is at stake. For Gurindji of north-central Australia (among whom McConvell has worked since 1973), skewing applies to "close" MBC and MMBC with a presumption/assertion of unmarriageability with Ego (vs. marriageability for more "distant" representatives of these categories: on close vs. distant in Australian kinship, see Jefferies 2018). Under skewing, MBD=M, ruling out actual (first-cousin) MBD-FZS marriage, and forcing marriages with more distant groups. Skewed referents of terms (e.g., *ngamayi*, MBD=M) are called *jawuku*, 'branch,' with the unskewed referent, e.g., a real mother, termed *marnaru*, 'trunk/base.' Compound *marnaru-jawuku* ('trunk-branch') is often used in discourse about patrilineage solidarity. Applications of skewed vs. non-skewed forms are pragmatic and flexible to an extent. For instance, WM, *mali*, can be shifted to *jaju*, MM, equivalent to MMBC in the Omaha skewing regime, and thus avoid marriageability and associated in-law avoidances.

Skewing often occurs proximate to the major boundary between Pama-Nyungan languages to the south, west, and east and non-Pama-Nyungan languages to the north. McConvell (2012) associates the early spread of Omaha skewing with the outspread of Pama-Nyungan groups from a homeland in Cape York Peninsula during the mid-Holocene; a later pattern (noted for Gurindji) similarly involves language-group outspread, but skewing here is less complex, occurring over shorter distances. Table 1 shows a hypothesis for long-term diachronic change, with evolutionary implications. At stage 1, MB and MBS have distinct terms. In stage 2, a skewed referent, MBS, is added to the MB term as an overlay on the co-extant MBS term so that MBS is optatively referred to as "MB" *or* "MBS." In stage 3, skewing becomes fixed, with MBS always referred to as MB, and the separate MBS term is lost. In stage 4, original "MB" meaning of the skewed term is lost, as is skewing; the referent is now only MBS, while a new term is adopted for MB, typically diffusing from neighbors. Under the Lounsbury-Scheffler model, these diachronic changes are parsible via addition and loss of equivalence rules, or by minor variations or sequential combinations of these rules (McConvell 2018:238).

Table 1. A diachronic sequence for Omaha skewing in Australia.
(Shading highlights the changes noted in the text)

<table>
<tr><th>Stage 1</th><th colspan="2">Stage 2</th><th>Stage 3</th><th>Stage 4</th></tr>
<tr><td>MB</td><td colspan="2">MB</td><td>MB</td><td>MB</td></tr>
<tr><td>MBS</td><td>MBS</td><td>MBS</td><td>MBS</td><td>MBS</td></tr>
<tr><td>No skewing</td><td colspan="2">Overlay skewing</td><td>Full skewing</td><td>Skewing lost;
shift of meaning</td></tr>
<tr><td>Two separate terms</td><td colspan="2">Both "MB" and "X-c" used for MBS, according to context</td><td>"MB" always used for MBS as well as for MB</td><td>Original MB term now means MBS; new term established for MB</td></tr>
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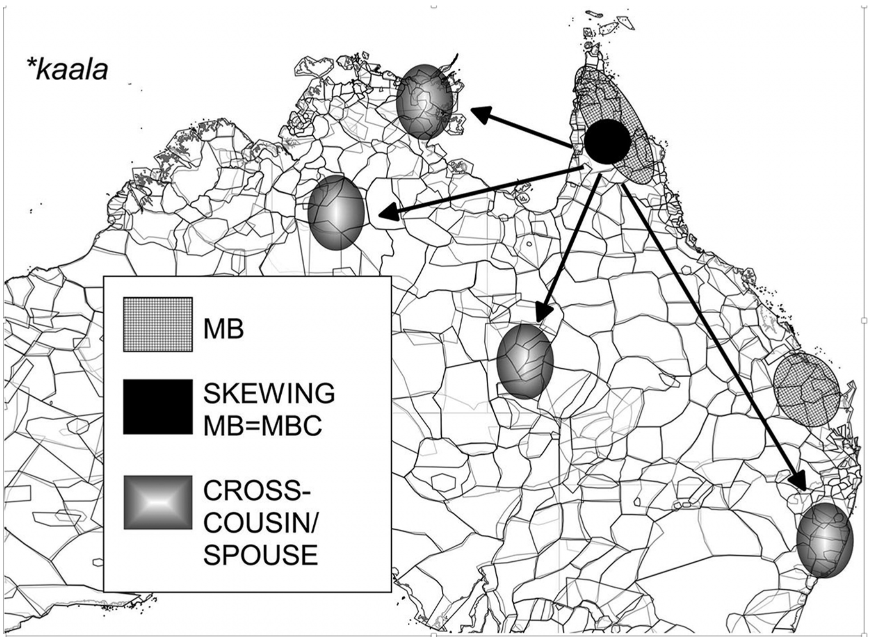

Figure 3. Pama-Nyungan *kaala* MB > cross-cousin/spouse. Mapping from Austkin © Patrick McConvell and William McConvell.

So *kaala*, a widespread Pama-Nyungan term, is reconstructible to proto-Pama-Nyungan *kaala, MB (Figure 3).[6] On the Queensland coast, *kaala* still means MB. To the west and south, into the Northern Territory, southern Queensland, and New South Wales, *kaala* means X-c and by extension E, as a X-c is the preferred spouse. This probably derives from a prior meaning as *matrilateral* X-c that in turn followed from the skewing extension MB=MBC; after skewing was lost, the matrilateral distinction was also lost, so that now MBC=FZC=E, a Dravidian equation. *Kaala* with Omaha skewing (MB=MBS) occurs near the center of the area (in northern Queensland) where *kaala* just means MB. In eastern Arnhem Land, the Yolngu (Murngin) reflex *kalay* means MBC, but with evidence of prior skewing (McConvell and Alpher 2002:165–66); since Yolngu ♂MBD=W, *kaala* here expresses the AXCM rule (McConvell 2012:254–55). This provides strong evidence that the term spread from an area of skewing in the northeast with the westward migration of Pama-Nyungan speakers, and then lost its original MB meaning.

How might these patterns inform skewing in North America?

SKEWING IN NATIVE NORTH AMERICA

Omaha systems occur in three culture areas:[7] Northeast Woodlands, Plains, and California (Figure 4; Table 2); in the latter two, Crow cases are nearby. Crow systems occur in the Southeast Woodlands, Plains, Southwest, California, and Northwest Coast

Figure 4. Skewing cases in Native North America. See Table 2 for ethnolinguistic group listings by number (Omaha) and letter (Crow). Base map for language-group locations: Goddard 1999 (used with permission). Figure drawn by Jennifer Steffey.

(overlapping into the Subarctic). No skewed systems are known for the Plateau, Great Basin, Arctic, or most of the Subarctic, all with sparser populations (Ubelaker 2006). Crow or Omaha systems cluster, mostly in subregions, sometimes across culture-area and language boundaries. All cases in the Woodlands, Plains, and Southwest coincide geographically with precedent archaeological traditions (ca. 800–1400 CE) featuring adaptive transition to intensive horticulture.

Northeastern Woodlands and Plains Omaha

From the Northeast Woodlands, an Omaha bloc of Central Algonquians continues west into the Plains, adjoining Siouan cases. Central Algonquians exhibit a north-south gradient of nomenclatures from Dravidian-Iroquois-Omaha (Trautmann and Barnes 1998): the Dravidian-Iroquois transition occurs at the Subarctic boundary, and the

Iroquois-Omaha, near the northern limit of 120 frost-free days (minimal for intensive maize horticulture). The latter forms a northern limit too for Mississippian archaeological cultures, which began ca. 1000 CE after adoption of maize-beans-squash horticulture (Coe et al. 1986:54–57). Mississippian adaptation notably occurred with "aggressive expansion" and colonization by new populations (Coe et al. 1986:57)—consistent with McConvell's model. An association between Central Algonquians and the Fort Ancient culture (ca. 1000–1750 CE, "sister" to Mississippian) along the middle Ohio River is generally accepted, as is an association between Siouans and the Oneota and northern Middle branches of the Mississippian tradition (Foster 1996:103). Ethnohistorically, both Algonquian and Siouan Omaha cases occur in areas of increased horticultural dependency, population density, and sociocultural integration, notably via patrilineal descent groups. The proto-Algonquian homeland is posited in the Lake Ontario–Georgian Bay region (Fiedel 1987:2): those moving south toward the Ohio Valley thus either innovated or acquired Omaha skewing (cf. McConvell 2012:258).

Goddard (1973:44) reconstructs Proto-Algonquian MB as *nešihsa, with close reflexes in Eastern Algonquian languages, none with skewing: stage 1 on Table 1. In Fox (Meskwaki), Sauk, and Kickapoo, reflex *nešisēha* (Callender 1962:114) is skewed: MB=MBS, etc. (Goddard 1992:246–49)—stages 2–3 on Table 1. Callender (1962:117) reconstructs a proto-Central Algonquian term for male X-c as *nīʔtāwahsa, with reflexes in all languages *except* those with skewing, where it is replaced by *nešisēha*. Proto-Algonquian kin terms are reconstructed as Dravidian—in other words, with prescriptive X-c marriage—by several analysts (Goddard 1973:53; Hockett 1964:251–56; Wheeler 1983). In short, replacement of the separate MBS term by skewed MB thus only occurred among a few Central Algonquian groups—those plausibly connected with descent from the Fort Ancient culture on the middle Ohio River.

Siouan languages comprise four subgroups: Mississippi Valley (Dakotan, Chiwere, Dhegiha), Ohio Valley (Biloxi, Ofo, Tutelo), Missouri River (Hidatsa, Apsáalooke), and Mandan (Goddard 1996:8). The proto-Siouan homeland, initially proposed for the middle Ohio Valley, is now sited in the Mississippi Valley, with Siouan subgroups tied to distinct archaeological traditions: Chiwere with Oneota, Dhegiha with Middle Mississippian, and Dakotan with Woodland (Foster 1996:103). Middle Mississippian Cahokia, the largest prehistoric city in North America (ca. 1050–1250 CE), is suggested as widely influencing Siouan social forms (Ives 1998:129). Again, all historical Siouan Omaha cases coincide with areas of higher population density and intensive horticulture.

So was Omaha skewing a Siouan invention borrowed by Algonquians, the reverse, or both under similar conditions of competitive expansion? Goddard (personal communication, February 2, 2019) infers Omaha skewing was likely adopted by Meskwaki-Sauk-Kickapoo (MSK), Menominee, and Miami-Illinois from Chiwere Siouans (Winnebago), after MSK "arrived in Wisconsin from Michigan in the seventeenth century." He notes, "there were alliances and intermarriages between various of these [groups] . . . , continuing to the present, and apparently extensive cultural borrowing" (cf. Vehik 1993:243). But Goddard also allows that influence may have occurred earlier from

Table 2. North American Crow and Omaha skewing (from sources cited in the text) by culture area (keyed to Figure 4)

	Skewing	Society/Language	Language subgroup	Language group	Language family	Proposed phylum
NE Woodlands						
1	Omaha	Potawatomi	Ojibwa-Potawatomi	E. Great Lakes Algonquian	Algonquian	
2	Omaha	Sauk	Fox	E. Great Lakes Algonquian	Algonquian	
3	Omaha	Meskwaki	Fox	E. Great Lakes Algonquian	Algonquian	
4	Omaha	Kickapoo	Fox	E. Great Lakes Algonquian	Algonquian	
5	Omaha	Mascouten	Fox	E. Great Lakes Algonquian	Algonquian	
6	Omaha	Miami	Miami-Illinois	E. Great Lakes Algonquian	Algonquian	
7	Omaha	Illinois	Miami-Illinois	E. Great Lakes Algonquian	Algonquian	
8	Omaha	Shawnee		E. Great Lakes Algonquian	Algonquian	
9	Omaha	Menominee		Menominee	Algonquian	
10	Omaha	Winnebago	Chiwere-Winnebago	Mississippi Siouan	Siouan-Catawba	
SE Woodlands						
A	Crow	Choctaw		Western Muskogean	Muskogean	Gulf
B	Crow	Chickasaw		Western Muskogean	Muskogean	Gulf
C	Crow	Creek	Nuclear Creek	Creek	Muskogean	Gulf
D	Crow	Seminole	Seminole	Creek	Muskogean	Gulf
E	Crow	Cherokee		Southern Iroquoian	Iroquoian	
F	Crow	Timucua		Timucuan	isolate	Gulf
G	Crow	Natchez		Natchez	isolate	Gulf
H	Crow	Taensa		Natchez	isolate	Gulf
I	Crow	Koroa, Tiou, Grigra	Tunica		Tunican	Gulf

J	Crow	Chitimacha		Chitimacha	Tunican/isolate	Gulf
K	Crow	Avoyel		Natchez?	Tunican/isolate	Gulf
L	Crow	Caddo		Southern Caddoan	Caddoan	
Ω	Crow/Omaha	Yuchi			Isolate	
Plains						
M	Crow	Kitsai		Northern Caddoan	Caddoan	
N	Crow	Wichita		Northern Caddoan	Caddoan	
O	Crow	South Band Pawnee		Northern Caddoan	Caddoan	
P	Crow	Skidi Pawnee		Northern Caddoan	Caddoan	
Q	Crow	Arikara		Northern Caddoan	Caddoan	
R	Crow	Tonkawa		Tonkawa	Isolate	
S	Crow	Mandan		Mandan	Siouan-Catawba	
T	Crow	Hidatsa		Missouri River Siouan	Siouan-Catawba	
U	Crow	Apsáalooke		Missouri River Siouan	Siouan-Catawba	
11	Omaha	Iowa	Chiwere-Winnebago	Mississippi Valley Siouan	Siouan-Catawba	
12	Omaha	Otoe	Chiwere-Winnebago	Mississippi Valley Siouan	Siouan-Catawba	
13	Omaha	Missouri	Chiwere-Winnebago	Mississippi Valley Siouan	Siouan-Catawba	
14	Omaha	Osage	Dhegiha	Mississippi Valley Siouan	Siouan-Catawba	
15	Omaha	Quapaw	Dhegiha	Mississippi Valley Siouan	Siouan-Catawba	
16	Omaha	Kansa (Kaw)	Dhegiha	Mississippi Valley Siouan	Siouan-Catawba	
17	Omaha	Omaha	Dhegiha	Mississippi Valley Siouan	Siouan-Catawba	
18	Omaha	Ponca	Dhegiha	Mississippi Valley Siouan	Siouan-Catawba	

Table 2. (*Continued*)

	Skewing	Society/Language	Language subgroup	Language group	Language family	Proposed phylum
Southwest						
V	Crow	Hopi		Northern Uto-Aztecan	Uto-Aztecan	
W	Crow	Hano	Arizona Tewa	Tanoan	Kiowa-Tanoan	
X	Crow	Zuni		Zunian	Isolate	
Y	Crow	Acoma	Western Keres	Keresan	Isolate	
Z	Crow	Laguna	Western Keres	Keresan	Isolate	
α	Crow	Zia	Eastern Keres	Keresan	Isolate	
β	Crow	Cochiti*	Eastern Keres	Keresan	Isolate	
γ	Crow	Jemez	Towa	Tanoan	Kiowa-Tanoan	
California						
δ	Crow	Wappo		Yuki-Wappo	Yukian	
ε	Crow	Southern Pomo	Russian River	Western Pomo	Pomoan	Hokan
19	Omaha	Tachi		Southern Valley Yokuts	Yokutsan	Penutian
20	Omaha	Gashowu	Northern Yokuts	Nim Yokuts	Yokutsan	Penutian
21	Omaha	Chukchansi	Northern Hill	Northern Valley Yokuts	Yokutsan	Penutian
22	Omaha	Yachikamne etc.	Northern Delta	Delta Yokuts	Yokutsan	Penutian

23	Omaha	Sierra Miwok	Sierra Miwok	Eastern Miwok	Utian	Penutian
24	Omaha	Coastal Miwok	Coast Miwok	Western Miwok	Utian	Penutian
25	Omaha	Lake Miwok	Lake Miwok	Western Miwok	Utian	Penutian
26	Omaha	Eastern Pomo	Clear Lake		Pomoan	Hokan
27	Omaha	Northern Pomo	Russian River	Western Pomo	Pomoan	Hokan
28	Omaha	Patwin		Southern Wintuan	Wintuan	Penutian
29	Omaha	Nomlaki	Wintun	Northern Wintuan	Wintuan	Penutian
30	Omaha	Wintu	Nuclear Wintu	Northern Wintuan	Wintuan	Penutian
Northwest Coast & Subarctic Margins						
ζ	Crow	Haida			Isolate	Greater Na-Dené
η	Crow	Tlingit		Athapaskan-Eyak-Tlingit	Na-Dené	Greater Na-Dené
θ	Crow	Tagish/Inland Tlingit	Athapaskan/Tlingit	Athapaskan-Eyak-Tlingit	Na-Dené	Greater Na-Dené
λ	Crow	Western Kaska	Nahanni	Athapaskan-Eyak-Tlingit	Na-Dené	Greater Na-Dené
μ	Crow	Tahltan	Nahanni	Athapaskan-Eyak-Tlingit	Na-Dené	Greater Na-Dené
ξ	Crow	Southern Tutchone	Tutchone	Athapaskan-Eyak-Tlingit	Na-Dené	Greater Na-Dené
π	Crow	Lower Inlet Dena'ina	Tanaina	Athapaskan-Eyak-Tlingit	Na-Dené	Greater Na-Dené

Dhegiha and Ohio Valley Siouans. Dhegiha (unified ancestral Omaha, Ponca, Osage, Quapaw, and Kansa, all with Omaha skewing) are held to originate in the lower Ohio Valley, spreading downstream to the Mississippi confluence and thereafter upriver into the Missouri River valley (DeMallie and Parks 2001:1067; Vehik 1993:232).

Proto-Siouan MB is reconstructed as *wréki, with reflexes in all languages with Omaha skewing, in non-skewed Dakotan, and in Biloxi and Tutelo (Matthews 1959:268–69). In the Crow Siouan cases (Missouri River and Mandan, discussed below), MB and MBS terms are innovations or semantic extensions of preexisting B and S terms (Matthews 1959:269–70). In Dakotan languages, FZC=MBC=spouse/sibling-in-law, Dravidian equations (for the terms, albeit with defective orthography, see Morgan 1871:322–25, 331–34). Matthews derives MB=MBS skewing throughout Mississippi Valley and Ohio Valley Siouan from skewed proto-Siouan *wréki. If skewing in Algonquian groups is specialized and subregional, for Siouan it thus appears old and pervasive. This supports Goddard's view that some Omaha skewing spread from Siouan into Algonquian languages, coincident with marriage alliance. We conclude that Omaha systems originated among Siouans, although whether this is datable to the earliest splits in proto-Siouan (1700–100 BCE; Foster 1996:103)—in other words, per Matthews's reconstruction—is unknowable. With Mississippian horticulture, Omaha skewing spread via migration (notably for Dhegiha and Chiwere). Competitive expansion in late prehistoric times likely saw Algonquians who migrated south from the Great Lakes to the middle Ohio invent skewing as a strategic social technology in emulation of and/or demographic competition with their Siouan Mississippian neighbors. For both Siouan and Central Algonquian Omaha, an association with intensified competition for resources under demographic pressure is indicated by patterns of adaptive and geographic distribution.

Southeastern Woodlands and Plains Crow

Crow systems, encompassing multiple language groups, occupy a continuous belt from Florida to the southern Prairie-Plains and intermittently northwestward to the High Plains of Montana. The Southeast Woodlands adaptation was primarily intensive horticulture,[8] with institutionalized hierarchy and matrilineal clans, some organized into exogamous moieties (e.g., Urban 1994). Crow skewing included Choctaw, Chickasaw, Creek, Seminole, Cherokee, Natchez, and Caddo and is inferred for Tunican, Chitimacha, and Timucua. The first four speak Muskogean languages, Cherokee is Iroquoian, and Caddo is Caddoan; the rest are probably isolates.[9] Yuchi, another isolate, is classified alternatively as Omaha or Crow. Muskogean societies are traced to Mississippian antecedents of the Middle Mississippian and South Appalachian provinces, ca. 900–1450 CE (Ensor 2002:325; Foster 1996:110; Smith 2000); Natchez to the Plaquemine province (Galloway and Jackson 2004); and Caddo to the Caddoan province (Foster 1996:105). Muskogean is the only family with roots entirely in the Southeast (Kaufman 2019:50), with a protolanguage homeland suggested in western Georgia or the Alabama-Mississippi border, and earliest splits ca. 2000 BP (Broadwell 1992; Foster 1996:109–10). Both Muskogean divisions—Western (Choctaw-Chickasaw) and Eastern (Alabama-Koasati, Hitchiti-Mikasuki, and Creek-Seminole)—include Crow skewing, suggesting antiquity.

As the only known Iroquoian-language case with skewing (all others had "Iroquois" systems), Cherokee is of particular interest. Whether Cherokee ancestors came south, separating from northern Iroquoians, or vice versa, remains debated, but Southeast presence and linguistic separation from northern Iroquoian is old (Fenton and Gulick 1961; Foster 1996:108–9; Lounsbury 1978; Whyte 2007). Cherokee FZ=FZD skewing is as clear as for its Muskogean neighbors (e.g., Eggan 1937; Spoehr 1947), although the terms themselves are Iroquoian (Gilbert 1955:290), not borrowed (e.g., Morgan 1871:322–25). Moreover, *e·hloki*, Cherokee FZ=FZD (Lounsbury 1961), has cognates in northwestern Iroquoian languages (Wyandot, Huron, Seneca) and Tuscarora, in which it only means FZ (stage 1 on Table 1). Central or eastern Iroquois languages (Cayuga, Onondaga, Oneida, and Mohawk) lost a separate FZ term, merging it with M, in a partial neutralization of crossness (Lounsbury 1961:13–16; MB crossness was retained). Lounsbury traces Cherokee *e·hloki* to proto-Iroquoian FZ, *-rahak-, and infers Cherokee has been a separate language for 3,500–3,800 years (from then-accepted glottochronology). Insofar as other Iroquoian FZ cognates are not skewed, and central Iroquoian lacks the FZ term, Cherokee semantic extension of FZ to FZD (etc.) is a unique innovation. Of the Muskogean groups, in other respects, Creek has "the most striking parallels" with Cherokee (Fenton 1961:258, n.1), including distinctively Southeastern Green Corn ceremonies (Witthoft 1949:83). Shared kinship practices between Creek and Cherokee include similar clan systems, preference for replicating G^{+2} alliances, and formal joking relationships (Gilbert 1955:336). Since Crow skewing is present throughout Muskogean, autochthonous to the Southeast, we infer that it diffused into Cherokee via intermarriage (cf. Urban and Jackson 2004:704–5). Crow skewing likely diffused from Muskogean also to Natchez and Caddoan via exchange and/or emulation, under adaptive intensification and demographic competition (see Coe et al. 1986:52). Muskogean domination throughout the Southeast and association with the earliest, most central Mississippian tradition enhance the probability that Muskogean was the origin of Crow skewing during the Mississippian.

Yuchi, at the Southeast-Northeast Woodlands divide (Jackson 2004), had both exogamous matriclans and Omaha skewing (Urban and Jackson 2004:701–2). Lesser (1929:718–19) implied skewing diffused from Siouans to the north, and matriliny from the Creek Confederacy to the south, which absorbed Yuchi in the eighteenth century (Speck 1909:7). Eggan (1937:35–36, 46–47), however, argued Yuchi changed historically from Crow to Omaha skewing, which spread from Central Algonquians (a position rejected by Urban 1994, but accepted by Jackson 2003)—resonant with McConvell's hypothesis (i.e., with Yuchi as the host of Algonquian expansion). While accepting Eggan's analysis, Speck (1939:172), the principal Yuchi ethnographer, who first treated Yuchi kin terms as Crow-skewed, noted substantial indeterminacy in Yuchi usages, from extensive intermarriages and multilingualism, especially in Creek and Shawnee (cf. Jackson 2004:415). That Omaha skewing spread into Yuchi from expanding/encroaching neighbors is emphasized in all accounts; Shawnee is the most likely source.

All but one Plains skewing cases occur in the Prairie-Plains (not High Plains), with characteristic adaptation to intensive horticulture along river bottomlands. At their western limit, the Siouan Omaha groups in the Missouri Valley were adjoined by upstream neighbors with Crow skewing: Siouan-speaking Mandan and Hidatsa, and Caddoan-speaking Arikara. The High Plains case is Apsáalooke (Crow Nation proper), once a unified group with Hidatsa, but who left the Missouri Valley after an eighteenth-century shift to equestrian nomadism (Voget 2001:695–97). Apsáalooke is the only North American Crow case with some patrilocal residence (Lesser 1929:719), reflecting adaptive change to bison dependency (Eggan and Maxwell 2001:979–81; Maxwell 1978). Apsáalooke nomenclature was apparently shifting in the late nineteenth century toward a Cheyenne pattern (see note 3), with neutralization of crossness in G^0. Lowie (1917:88–90) reported that Apsáalooke kin-term usage and clan identities were considerably more fluid than Hidatsa and Mandan,[10] hinting at loss of skewing and/or neutralization of crossness following the shift to a High Plains adaptation (consistent with McConvell's 2012 model of "upstream" migration into less demographically competitive environments: also see Dousset 2012).

Mandan settlement in the Missouri Valley and relations with proximate Caddoans were of long standing (Bowers 1965:484). In contrast, Hidatsa and Apsáalooke only arrived "from the western edge of the Woodlands" after 1615, when Hidatsa and Apsáalooke were still "one people" (1965:476, 481). By 1700, the Mandan "were developing a strong tribal organization" (1965:485). Over time, Hidatsa and Mandan formed close ties, with isomorphous matriclans, extensive intermarriages, and significantly, usage of equivalent kin terms with each other but not with Apsáalooke, at least after the Hidatsa-Apsáalooke separation (Bowers 1965:67–70, 90–91). Cognate Mandan and Hidatsa kin terms nonetheless reflect their separate Siouan language groups: Hidatsa FZ=FZD is *š´wi*, whereas in Mandan it is *túminik* (Matthews 1959:271), suggesting denotative but not phonological fusion of the skewed term. Apsáalooke *wāxia* diverges even more from reconstructed proto-Siouan FZ *thúwį (1959:271). Mandan and Missouri River are the only Siouan cases where FZ is skewed. Matthews (1959:271) reconstructs *thúwį as FZ=MBW, a Dravidian equation retained in Dakotan reflexes. We infer that the FZ term replaced FZD only in Mandan, Hidatsa, and Apsáalooke: all other Siouan languages show Dravidian, Iroquois, or Omaha equations. Migration narratives and social data cited by Bowers (1950, 1965) suggest Hidatsa and initially Apsáalooke were absorbed into a preexisting structure of Mandan matriclans and Crow skewing via exchange relations including intermarriage.

For Mandan and Hidatsa, historical geography begs the question: if Crow skewing was an autonomous invention, why do their close Caddoan neighbors also have it? And if the shared practice was not random, did it spread from or into Caddoan Arikara and Pawnee? Arikara, Mandan, and Hidatsa long had a "relatively homogeneous culture" (Bowers 1965:478), with close ties since at least the seventeenth century (Krause

2012:126). Oral traditions record Skidi Pawnee and Arikara as once unified before Arikara migrated up the Missouri River (Bowers 1965:477). Bowers suggests co-migration by ancestral Arikara and Mandan from the south, consistent with archaeological data (Krause 2012:126). From oral traditions, Linton (1924:252) inferred the co-migration was "comparatively recent" and was owing to a (non-Mandan) Siouan invasion from the east and northeast—in other words, probably Dhegiha (cf. Vehik 1993:232).

Caddoan languages are divided into Northern (Arikara, Pawnee, Wichita, and Kitsai) and Caddo (Chafe 1976:11–16; Goddard 1996:8). Ancestry is attributed to the Caddoan province of the Mississippian archaeological culture along the lower Red and Arkansas rivers (Foster 1996:105; Perttula 2008:91). Historically, groups occupied intermittent territories from Caddo in the lower western Mississippi Valley north to Arikara along the Heart River (a Missouri tributary). The protolanguage homeland is inferred as the Caddo region proper (Foster 1996:104). Crow skewing is recognized for Arikara and Pawnee (Schmitt and Schmitt 1952, contra Murdock 1949:324–25), with Wichita dubbed Hawaiian by Murdock (1967; Kitsai, socially incorporated into Wichita [Lesser 1979], was probably similar). Crossness is clear in older Wichita G^{+1} and G^{-1} terms (F=FB≠MB; BC=C≠ZC) but neutralized for FZ: FZ=MZ=M (Schmitt and Schmitt 1952:5). The only skewing equations were both optative: F=PF=PPF and PM=PPM (1952:6). The Wichita were strongly matrilocal (1952:11).

Recognition of Crow skewing for Caddoans except Arikara and Pawnee was long occluded. For his 1920s cross-cultural survey, Lesser (1929:711, 727) accepted Rivers (1914) that skewing was caused by the secondary intergenerational marriage rule (for Crow, of MBW with HZS). If that rule was absent, Lesser did not count systems with lineal equations as Crow or Omaha. So, in a paper on Caddoan kinship written the same year but published a half-century later, Lesser (1979) excluded Caddo, Wichita, and Kitsai from Crow. However, reanalysis of Wichita kin terms and comparison with Pawnee, Arikara, and Caddo led Schmitt and Schmitt (1952:59–61) to reconstruct prior Crow skewing and matrilineal descent for all. Like Wichita, Hainai (a Caddo dialect) has no cross-parallel distinctions in G^0, but in G^{-1}–G^{-2} it skews ♂ZC=♂ZCC (Lesser 1979:268): in other words, an at least partial Crow skew. That Caddo term is *pahtsi*, accompanied by another partly Crow-skew, *cáhat*, FZC=FZCC, "which follows from the merging of *pahtsi* and the children of *pahtsi* in a single usage" (Lesser 1979:270). Lesser (1979:268) emphasizes these terms "must be very old, as they are undoubtedly related to the stems for these concepts in all other Caddoan dialects." Moreover, Caddo has MBC=C (1979:270), a diagnostic Crow equation. Lesser, however, rejected Crow status because "the mother's brother's wife is classed with the daughter-in-law in a relationship of mutual respect," vitiating the secondary marriage hypothesis. Although the equations listed are not all matrilineal, their trend is strongly so. Johnson (1994:409) cites Caddo and Hainai terminology as Crow-like; Rogers and Sabo (2004:624) conclude that Caddo had a "modified Crow terminology."

Also significant here is Tonkawa, a linguistic isolate adjacent to Caddoan, now classed as Crow (Johnson 1994). Johnson (1994:408) argues that skewing spread from

Northern Caddoan neighbors, when Tonkawa resided along the upper Arkansas River (before the eighteenth century; Newcomb and Campbell 2001:954). Tonkawa proximity to Wichita, Kitsai, and Caddo throughout historical migrations suggests ongoing social ties (Johnson 1994:403). Lesser (1979:270–71), who did not treat Tonkawa as Crow, reports shared kinship elements, including PP-CC reciprocal terms, with Caddo and Hainai; they are also shared with Wichita (Schmitt and Schmitt 1952). In short, there are Crow signals among all Caddoan groups—clearest among Pawnee and Arikara, evident in Caddo, and reconstructed for Wichita and Kitsai. All were previously matrilineal-matrilocal (Lesser 1979:263; Schmitt and Schmitt 1952), as were their Tonkawa neighbors. In contrast, Crow skewing was marginal and exceptional among Siouans. The logical inference is that skewing originally spread into Mandan from Caddoan (notably, ancestral Arikara/Pawnee) and was later acquired from Mandan by Hidatsa and Apsáalooke immigrants, who fused socially more (Hidatsa) or less (Apsáalooke) with Mandan. Johnson's (1994) argument for Caddoan as the source for Tonkawa skewing indirectly corroborates this conclusion.

Southwest

Here all skewed cases are Crow, and all are Pueblos, sedentary agricultural societies descended from the Ancestral Pueblos (some apparently matrilineal-matrilocal, based on mtDNA and residential architecture: Kennett et al. 2017; Whiteley 2015). A contiguous Crow series runs from west to east: Hopi, Hano, Zuni, Keresan, and Jemez (Whiteley 2018:119–22). Language differences are substantial: Hopi is Northern Uto-Aztecan, Hano (Tewa) and Jemez (Towa) are Kiowa-Tanoan, Zuni and Keresan are isolates. Within the widespread Uto-Aztecan family, Hopi is the sole case with skewing or matriclans (Hill 2018). For Hopi, the core equation FZ=FZD is *kya*, and for their Hano-Tewa neighbors at First Mesa it is *kiyu*, a term also skewed among Rio Grande Tewa (Whiteley 2018:122). Notwithstanding some phonological resemblance, Hill (2018) treats Hopi *kya* and Tewa *kiyu* as of separate origin. At Zuni, the core term is *kuku* (Hill 2018:147), among Keresans it is *k'uuya* (2018:150–51), and at Towa Jemez it is *chiyu* or *chi'i*, cognate with Tewa (Hill 2018:144; Whiteley 2018:122). Keresan *k'uuya* is autochthonous, deriving from *k'ú*, "female, woman" (Miller 1959:183).

Hill (2018:137–39) concludes that no Hopi kin terms are borrowed but that all descend from Proto-Takic (southern California Uto-Aztecan), with most reconstructible to Proto-Uto-Aztecan (PUA) itself. She argues Hopi *kya* is "an irregular reflex of PUA *ka," reconstructible to Proto-Northern-Uto-Aztecan *qa, which "included FM in its range of meanings" (Hill 2018:139). Thus, Hopi *kya* "is probably a Puebloanization of [*qa]," considering that "in both Zuni and the Tanoan language Towa, [ky] is a regular allophone of /k/ before /i, a, e/" (2018:139). Phonological change in Hopi from *qa to *kya* "is evidence in favor of a Puebloan *Sprachbund*" (2018:143). For Hopi *kya*, the shift in sound accompanied a shift in meaning, from FM to FZ and FZD, constituting the origin of Crow skewing in Hopi. As FZ=FZD, *kya* replaced "one of the most stable of all Uto-Aztecan etyma: PUA *pah(w)a 'FZ'" (2018:143). Hill implies Hopi skewing was borrowed from Pueblo neighbors, with whom long-term ritual exchanges and intermarriages are well-established. Historical exchange between Keresan and Hopi is also suggested by traditions of Keresan settlement among late-prehistoric Hopi archaeological sites (e.g., Kawayka'a on Antelope Mesa). Whereas for Hopi, skewing is not optative and descent groups are better defined, Fox (1972) argued Keresan skewing was discursively contextual, co-extant with crossness and bilateral X-c marriage. Optative usage of Crow or Cheyenne terms is also recorded for Zuni, Acoma, and Laguna (Hill 2018:146–53; Schneider and Roberts 1956:16–18), consistent with Kronenfeld's model. Thus, Hopi aligns with stage 3 of McConvell's phased model (Table 1), with the other Pueblos at stage 2.

Hopi was the type case for Lévi-Strauss's "semi-complex." But despite formal prohibition on marriage with F's clan set, in practice a substantial proportion of Hopi marriages occur between (classificatory) *kya* (FZ=FZD) and reciprocal *mööyi* (BS=MBS) (Whiteley 2012). The result is a quasi-preference for patrilateral X-c marriage (FZD-MBS), exemplifying the contradictory imperatives toward repetition vs. dispersal of alliances characteristic of semi-complex (McKinley 1971b). The same patrilateral preference is evident in a discursive equivalence for Keresan Laguna of FZD=MBS=E (Parsons 1932:384). Patrilateral naming conventions (FZ as primary name-giver to BS) demonstrably spread from Keresan to Zuni and Hopi (Whiteley and Snow 2015). Naming conventions that dovetail with patrilateral matrilines and are shared across language differences mirror the shared semantics of kin-term skewing.

The Crow cluster of proximate Pueblos representing four linguistic groups, whose other shared cultural features derive from long-term systematic exchange, strongly argues for diffusion. As unique among Uto-Aztecans (whose protolanguage homeland is probably central Mexico; Hill 2001; Wheeler and Whiteley 2015), skewing most likely spread into Hopi along the same route as the conventions featuring FZ=FZD as name-giver: from Keresan to Zuni, and from Keresan and/or Zuni into Hopi, but strengthening matrilineal descent in the process (it is weaker among Keresans). Thus, as well as Zuni and Tanoan phonology, Keresan FZ=FZD *k'uuya* likely affected Hopi transition from *qa to *kya*. Crossness was clearly present in Rio Grande Tanoan nomenclatures, and skewing probably as well (Whiteley 2018). Hano-Tewa skewing was reinforced (at least) by extensive intermarriages with First Mesa Hopis since 1700. Inter-pueblo alliances, mediated by a shared clan system, suggest absorption and fusion of demic groups, rather than conquest. We conclude that skewing spread with intermarriage between immigrant Keresan demes with Zuni and Hopi; over time, migrants assimilated linguistically. In turn, affirmative skewing spread into Hano-Tewa (or was reinforced) via intermarriage with their Hopi neighbors, although Hano maintained linguistic separation.

California

All skewed systems cluster in the resource-rich Central Valley and nearby North Coast Range.[11] Skewing encompasses five language families: Yokutsan, Utian, Wintuan, Pomoan, and Yukian, the first three grouped in putative Penutian, and Pomoan in putative Hokan (Goddard 1996:6–7). California was the most linguistically diverse and populous culture area of all, with highest densities in the Central Valley near the California (Sacramento–San Joaquin) Delta (Baumhoff 1963:223, map 7). Linguistic, archaeological, and biological data suggest successive in-migrations (e.g., Golla 2011; Hughes 1992; Johnson and Lorenz 2006; Moratto 1984). Golla (2011:239–53) infers that Yukian and Chumash represent the oldest stratum of languages; Hokan (including Pomo) arrived during the Archaic, and last, the three separate Penutian groups (Miwok, Wintu, Yokuts). Archaeologically, the Central Valley shows earliest occupation by ca. 2000 BCE (Elsasser 1978). Resource abundance enabled sedentism in a foraging economy based on fish, acorns, and game, with sociocultural complexity "truly analogous to that customarily found in horticultural and agricultural societies" (Bean 1978:681).

Beginning in the southern valley with Tachi (Southern Valley Yokuts), Omaha cases proceed northward among Foothills Yokuts, Sierra and Plains Miwok, and Northern Valley Yokuts to the San Joaquin delta (the last inferred from Wallace 1978:466). In the Sacramento Valley, Wintuan cases proceed downstream from Wintu to Nomlaki and Patwin toward the Sacramento delta, succeeded by Plains Miwok. Lake and Coast Miwok in the North Coast Range were contiguous to Pomoan cases. The two Crow instances, Wappo and Southern Pomo, occur within the Pomo territorial bloc, whose protolanguage homeland is sited at Clear Lake (Golla 2011:246). Gifford (1922:162–64, 207) argued Omaha skewing is "essentially Penutian," with the "center of gravity" among northern Yokuts and southern Wintuan, "the two stocks that held the great valley." Essentially, Gifford (1922:205–7) argued that skewing spread among peoples lateral to the Central Valley via population flows of Yokuts (northward) and Wintuans (southward) toward the California Delta. Gayton (1945:423) inferred exogamous moieties diffused from Yokuts into Miwok, "[following] the waterways." *Kaka*, MB=MBS, is constant throughout Miwokan (Gifford 1916:173, 1922:86–93; Plains Miwok adds a suffix for MBS, *kakatci*), despite language divergences beginning ca. 2,500 BP (Golla 2011:156). Indeed, Gifford (1922:228) reconstructs proto-Miwok MB as *kaka, suggesting either long-term stability, continuing social interchange (his inference), or (ours) the possibility that MB=MBS spread as a later semantic innovation from Yokuts and/or Wintuans. Possible cognacy with Yokuts MB/MB=MBS *akash/agas/kokwat* (Gifford 1922:77–85; Kroeber 1917:353)[12] is noteworthy, especially with Gayton's suggestion that Miwok moieties spread from Yokuts. Yokutsans, with shallow dialect differences, arrived in the southern Central Valley from the Great Basin ca. 600–700 CE, migrating down the San Joaquin and among its eastern tributaries (Golla 2011:252).

"Penutian" ties among Miwok (Utian) and Yokuts are distant, with Wintuan even more so. The homeland for proto-Utian is placed near the California Delta ca. 2500 BCE, associated with Windmiller archaeological sites (see, e.g., Coe et al. 1986:80 map), following westward migration from the Great Basin (Golla 2011:252–53). Proto-Miwok diverged ca. 1000–500 BCE within the North Coast Range and spread eastward into the valley after 500 BCE; splitting of Miwok into Western and Eastern coincided with Southern Wintuan intrusion into the lower Sacramento Valley ca. 500–600 CE, associated with Augustine archaeological sites (Golla 2011:253). The Proto-Wintuan homeland is placed in southwest Oregon ca. 500 CE; while displacing Miwokans from the lower Sacramento Valley, Southern Wintuans borrowed their fauna and flora terms (Golla 2011:250).Whistler (1980:352–58) reconstructs proto-Wintuan kin terms as Lounsbury's Omaha Type III; River Patwin, the "larger and wealthier" groups along the lower Sacramento, enhanced skewing to Type IV, while Northern Wintuans lost it in adapting to less abundant environments, first toward Iroquois, and then Eskimo terms (cf. McConvell 2018:233–34).

Having first found only exogamous moieties among Miwok, Gifford (1926:398, 1944) later discovered named, localized, exogamous patrilineages. Yokuts had similar patrilineages (within moieties), also evidently (not explicitly) exogamous (Gayton 1945:412–24), and Wintuans had the same pattern (Goldschmidt 1948:445–48). Goldschmidt (1948:452–53) argued that full exogamous patriclans arose among Nomlaki under increased population density and "advanced exploitation of a fairly rich environment," requiring stronger units of social integration: another resonance with McConvell's model. For Penutian and Pomoan Omaha (Gifford 1922:255–56), local patrilineages practice AXCM (MBD-FZS) (see Forth 2008). Gifford (1916:187–91, 1922:254–55) argued that skewing arose from unilineal descent and (following Rivers 1914:28) the *secondary* intergenerational marriage rule (WBD-FZH). That rule, he claimed, preceded and shaped the *primary* AXCM rule (Gifford 1916:191, 1922:256). Lévi-Strauss (1949:450–55), however, demonstrated that the equations Gifford derived from the secondary rule correlated equally to the primary rule. Miwok alliance (and the other California cases) was thus accepted by mid-century theorists (Leach 1951; Lévi-Strauss 1949; Needham 1962) as AXCM.[13] Subsequently, as noted above, Lounsbury (1964a) formally distinguished Iroquois vs. Dravidian crossness, and Lévi-Strauss (1966) separated AXCM from semi-complex. The notion that AXCM remained apposite for California cases—alone in North America—was upheld by Needham (Forth 2008). Trautmann's (2012) proposal for one evolutionary route to skewing, Dravidian ↔ AXCM ↔ Crow-Omaha, finds support here: *all* skewed cases have common (Dravidian) equations FB=MZH and MZ=FBW (present among the Omaha proper too; Parkin 2019:88); two Omaha cases (Wintu, Northern Pomo) have MB=FZH (as well as MB=MBS), and three cases (two Omaha [Wintu, Northern Pomo], one Crow [Southern Pomo]) have FZ=MBW (as well as FZ=FZD) (Gifford 1922:167–69, 173). Although such equations do not rule out Iroquois (vs. Dravidian) crossness (Trautmann and Barnes 1998:51), their conjunction with AXCM and skewing here corroborates Trautmann's position.

Wappo and Southern Pomo, the only Crow cases, offer further insight. Wappo migration (from the north) into the Napa Valley is dated ca. 500 CE (Golla 2011:241). Linguistically, Wappo (Yukian) was extensively influenced by Pomo, and to a lesser extent by Miwok and Patwin (Golla 2011:241), but is remote from other Yukian groups. Wappo and Northern Yukian share only 20% of their basic vocabulary, though 42% of their terms for plants, including those of economic importance gathered by women (Elmendorf 1968:16), whereas only 9% are shared for animals, including objects of male hunting (Elmendorf 1968:12–16). Elmendorf inferred an earlier period in which matrilocal Wappo women regularly married non-Wappo men (Golla 2011:193). "Pomoization" (Golla 2011:241) of Wappo linguistically suggests immigrant male spouses were predominantly Pomo; Crow skewing for both Wappo and Southern Pomo would have been reinforced by a more female-centered resource base (Gough 1961:552). Wappo kin terms include relative age for all uncles and aunts as well as siblings—the single most variegated of all in Gifford's (1922:144) extensive comparison. Northern Yukians (Yuki, Huchnom, Coast Yuki), all non-skewed, have equations MB=FZH and FZ=MBW, whereas Wappo shows FeZ=MeBW, with MyBW a separate term (Gifford 1922:169–73). But Wappo also equates FZ=eZ (1922:150), exceptional for Crow systems. Numerous California terminologies, both skewed and non-skewed, have FZ=Z, a patrilineal equation (Aginsky 1935:450; Gifford 1922:150–51). As the only Yukian instance, Gifford (1922:150–51) infers semantic diffusion into Wappo for this equation from Penutian. Southern and Eastern Pomo, as well as most Miwok and Yokuts, have FZH=ZH, which Gifford (1922:150–51) interprets as "tacit" FZ=Z. The general equation FZ=FZD=Z, explicit for Wappo, latent for Southern Pomo, ambiguates any association with matriliny, and there are patrilineal or nonlineal skews as well (e.g., FeB=FF=FPB=FPF). In short, assignment of "Crow" to Wappo is somewhat indeterminate: Gifford (1922:116–17) received "conflicting" X-c terms—Crow or Cheyenne—suggesting optative usage. *Etsa*, the core Crow FZ=FZD equation, also embraces eZ, FeBD, and MeZD, either a hybrid of skewing with Cheyenne neutralization of crossness or the ethnographer's conflation of alternate usages.

Wappo had patrilineal non-exogamous moieties and, in some groups, matrilineal local exogamy, with ambilocal residence (Driver 1936:205, 215). Among Eastern and Northern Pomo (Omaha), residence was ambilocal, but chiefship was inherited matrilineally (Gifford 1926:397). Gifford (1922:164) read Southern Pomo and Wappo Crow skewing as an "intrusive, recent" change on underlying patrilineal descent. But matrilineal aspects for Northern and Eastern Pomo and patrilineal for Southern Pomo and Wappo suggest ambilateral or even double descent (cf. Kronenfeld 1975; Kunkel 1975). For three Pomo groups, with Crow, Omaha, and Dakota (patri-Iroquois) systems, respectively, Aginsky (1935) showed variations owed to marriage practices (levirate, sororate, plus the secondary marriage rule), and whether a child's use of terms for affines followed its mother, father, or both. Social heterogeneity among Pomo, with mixed descent and ambilocal residence, suggests shallower development of skewing than the Penutian cases, and Aginsky's account presages Kronenfeld's idea of skewing as optative.

Northwest Coast

Haida and Tlingit, the two principal cases with (Crow) skewing, cluster on adjacent islands and coastlines of British Columbia and Alaska. Both typify areal adaptation to abundant marine and estuary resources, especially anadromous fish, which allowed relatively dense populations, sedentism, and social stratification. Both have named matriclans, internal lineages/houses, avunculocal residence, exogamous moieties, and participate prominently in a regional exchange system, notably via the potlatch (e.g., De Laguna 1990; Swanton 1905). Tlingit is recognized as a Na-Dené language in the narrow sense, i.e., with Eyak and Athapaskan; Haida, sometimes included within a putative larger Na-Dené phylum, is mostly treated as an isolate (Foster 1996:76–77). Genetic and archaeological evidence suggests Haida descend from a founder population and Tlingit-Eyak-Athapaskan from a separate, early regional group, with limited Haida-Tlingit genetic exchange until fairly recently (Lindo et al. 2017; Mackie et al. 2018; Schurr et al. 2012). Swanton (1904:483) hypothesized that Haida and Tlingit moieties derive from amalgamation (with Raven originally Haida, Eagle originally Tlingit), and that matrilineal clans also "originated through the intermarriage of the Haida and Tlingit" (1904:385)—with inverse totemic crests in their respective Raven and Eagle moieties (Swanton 1905:66). Durlach (1928:166) argued that Haida skewing originated with the introduction of clans from Tlingit. With morphosyntactic evidence, Durlach shows that Haida *ho· ˊsgona* (♀BC=♀MBC), reciprocal to *sqan* (FZ=FZD), is "comparatively new," inferring that *sqan* replaced a preexisting Iroquois X-c term (Durlach 1928:110–11). According to Murdock, Tlingit and Haida developed skewing, clans, and moieties, upon Iroquois crossness "under the influence of superior environmental potential and sedentarization" (Dyen and Aberle 1974:328).

The Athapaskan (Crow) cases are Lower Inlet Dena'ina (Kari 1977:279–80), Southern Tutchone, Tahltan, and western Kaska (Dyen and Aberle 1974:275), with "Inland Tlingit" (Tagish, Teslin, Atlin) representing "Tlingitization" of an Athapaskan population (McClellan 1953:50). All cluster near coastal Tlingit, with whom there was extensive social exchange (Dyen and Aberle 1974:275, 366, 402; Kari 1977:279; McClellan 1953:51). For Kaska, Crow skewing was present only among western communities near Tahltan, Tlingit, and Southern Tutchone (Honigmann 1954:77–83, 1981:442), with whom there was intermarriage, especially during the nineteenth-century fur trade. Dyen and Aberle (1974:274–75, 289) conclude that "the Crow warp" spread with clans and moieties from Tlingit into Tahltan and thence into Kaska during that period. Eastern Kaska groups, more fully within the sparse Subarctic biome, lack unilineal descent, moieties, and skewing, using Iroquois/Dravidian cousin terms and preferential X-c marriage (Honigmann 1954:82–83, 135). Intermediate Kaska groups have skewing and matrilineal descent, with joint preferences for AXCM and sister exchange (Honigmann 1954:77, 131). These Kaska variations—Subarctic > Northwest Coast, east > west, Dravidian > Iroquois > Crow—echo the Central Algonquian gradient (cf. Ives 1998:134), correlated with increased population density and economic intensification. Oral tradition has Tlingit matriclans initially being established by coastal women marrying into interior communities to promote alliances and trade (McClellan 1975:401–38). Tlingit is also suggested as the source of Lower Inlet Dena'ina skewing (Swanton 1904:479); other Dena'ina all have Iroquois/Dravidian crossness (Kari 1977:279).

DISCUSSION

Omaha skewing in Australia is a feature of societies expanding by migration: it tends to promote ever-wider marriage alliances by prohibiting bilateral cross-cousin marriage and sister exchange—marriage regimes associated with Dravidian crossness. Under demographic stress, language groups migrate downstream, encroach on other groups, and over time absorb them via AXCM and patrilocal residence rules. Skewing enhances patrilineal descent groups and entrenches their territorial interests, resulting in replacement of the encroached-upon group's language. Although evidence of AXCM for most Omaha cases in North America is lacking, migratory spread patterns are discernible in the ethnohistoric and archaeological records for Central Algonquians, Dhegiha and Chiwere Siouans, and throughout California's Central Valley: in the last, AXCM is positively attested. But North American Omaha cases also show spread by diffusion: possibly from Siouan into some Central Algonquian, and probably from Yokuts into Sierra Miwok, and Wintuan into Plains and Coast Miwok and Pomo. In those instances, while groups whose territories were encroached on were not absorbed linguistically, their adoption of skewing, with its inherent alliance rules, implies intermarriage, "the archetype of all other manifestations based upon reciprocity" (Lévi-Strauss 1969:481).

What about Crow? Hopi social ideology emphasizes centripetal migrations by demic units (named as matriclans) incorporated via matrilocal marriage and assigned lands and residential areas in exchange for ritual and other contributions. Community integration was achieved via intricate semi-complex alliance ties among matriclans. In other words, the migration emphasis is the reverse of Omaha: instead of outward movement and encroachment, the movement emphasis is inward, with absorption of immigrant demes into a host social structure. The host community retained its language while immigrant languages were mostly lost over time. Matriclan variegation, confederation, and semi-complex alliance among Muskogeans, Cherokee, Mandan, Hidatsa, Apsáalooke, Tlingit, and Haida are at least overtly similar. Moreover, no Crow cases apparently reflect the downstream/encroachment pattern. Insofar as we identify Muskogean and Caddoan/Natchez as the sources of skewing spread in the Southeast and Prairie-Plains, both linked with in situ developments of Mississippian archaeological cultures, out-migration does not appear a plausible origin for Crow skewing. Intersocietal diffusion of Crow skewing is evident for the Pueblos; Muskogean into Cherokee, Natchez, and Caddoan; Mandan into Hidatsa and Apsáalooke; Wappo into Southern Pomo; and Tlingit into Haida and northern Athapaskan. In all cases, reciprocal exchange of other cultural features—ceremonies, adaptive practices, material culture, etc.—is also present. No discernible linguistic replacement occurs (beyond the semantics of skewing), except for Tagish (Inland Tlingit: see McClellan 1975). As with Omaha, we infer that structures of reciprocal exchange whose archetype is intermarriage provide the underlying mechanism for intersocietal spread of Crow skewing.

The inverse Omaha and Crow patterns are illuminated by Read's (2010) model of population increase on patrilineal vs. matrilineal societies: the former tend to fission, replicating and outspreading units that maintain similar population sizes; the latter enhance internal ties and amalgamate units, resulting in growth of overall societal size. The Crow-matrilineal cases agree with Read's model but expand this to inter-societal ties: Cherokee as a whole was not amalgamated into Creek society, nor Hidatsa into Mandan, Keresan into Hopi, Haida into Tlingit, and so on. But their coordinated skewing and marriage rules allowed extension of alliances beyond their borders, diminishing competition. In a related vein, Hammel (2005) frames the effects of demographic stress/increase on kinship systems as both Malthusian, leading to group fission and "emigration out of a common ecological zone," and Boserupian, where "the group may move upward technologically . . . by innovating or adapting its institutions and practices to accommodate its new size" (2005:11954). "Technology" for Boserup specifically includes "social technology" (2005:11954). Omaha and Crow represent alternative social technologies: innovative extension of kin-term meanings for MB or FZ, overlaying or replacing MBS or FZD, strengthens descent lines and reorients marriage rules. Skewing as agentively deployed social technology strengthens descent groups and disperses alliances via AXCM or semi-complex rules. Malthusian and Boserupian forces are present for both Omaha and Crow, but in contrasting measures, with Omaha-patriliny more fissile and Crow-matriliny more fusional. Although descent-group "strength" may be conceptually amorphous (McKinley 1971a), named, exogamous unilineal groups are clearly marked in North America: Hopi, Tlingit, Cherokee, Creek, Arikara, Mandan (Crow), and Omaha, Osage, Illinois, Valley Yokuts, and Nomlaki (Omaha). Moreover, in peripheral areas, there is discernible "fading out" of both descent-group strength and skewing: northern Central Algonquians, Apsáalooke, Southern Valley Yokuts, Northern Wintu, Plains Miwok, Wappo, Southern Pomo, Kaska, and Upper Inlet Dena'ina.

Cross-culturally, agnatic and uterine systems—with or without the enhancement of skewing—correlate with variant social morphologies, including emphasis on female- vs. male-centered economic resources and externally vs. internally directed warfare and feuding (e.g., Aberle 1961; Divale 1984; Jones 2011; Martin 2019; Murdock 1949, 1967). For agnatic groups, fission and migration/expansion into new areas associated with resource competition are typical (e.g., Martin 2019; Sahlins 1961). Uterine systems tend to occur in areas of more reliable resource abundance,[14] where "they are particularly adept at creating and maintaining stable alliance networks . . . through cross-kin cooperation and collaboration [rather] than fission and competition" (Martin 2019:202; cf. Surowiec et al. 2019). Empirically, of course, cycles of fission and fusion are characteristic of both, and fusion of patrilineal groups is also represented in our sample: Algonquian with Siouan or Yuchi, Yokutsan with Miwokan, Miwokan with Pomoan, Wintuan with Miwokan and Pomoan. But based on distributions and inferred patterns of spread, Crow and Omaha social morphologies do trend in obverse ways. Crow characteristically disperses alliance *within* an anchored sociogeographic space, expanding its reach from center to periphery (e.g., by Tlingit "planting" of matriclans among Athapaskans)—but without radical changes to the existing territorial mosaic of ethnolinguistic groups. Conversely, Omaha expansion involves replication and budding off of migrant units *outward*, separating from a former center and colonizing its peripheries.

CONCLUSIONS

Whereas Omaha skewing, with its patrilineal and patrilocal tendencies, correlates with downstream expansion and encompassing of demes from neighboring groups, Crow, its mirror opposite, with matrilineal and matrilocal tendencies, absorbs immigrant demes in a pattern of in situ consolidation and growth. These tendencies reflect the basic sex of Omaha and Crow skewing structures as male and female, respectively: agnatic vs. uterine. Omaha and Crow skewing are thus strategic agentive alternatives with inverse social correlations to demographic increase. Our hypothesis is that in situations of demographic stress and/or ecological competition, skewing as social technology increases the strength and social capacity of descent groups and enhances the structure of their relationships with other, like units (both intra- and intersocietally) via dispersed alliance, conferring selective advantages. We infer this is the case for both AXCM and semi-complex, notwithstanding their differential pathways out of and (perhaps back) into Dravidian and Iroquois crossness. Within the particular regions, environments, and adaptive regimes where Crow-Omaha systems occur, skewing advantages a society's competitive capacity through specific alliance-building mechanisms. We present this as a hypothesis for testing in other global regions.

NOTES

We dedicate this paper to the memory of Jane Hill, highly respected colleague who passed away while we were writing. Jane's contribution to integrating historical anthropology, historical linguistics, and archaeology has been an inspiration to us. Her interdisciplinary approach to kinship history in the Pueblos, published not long before she died, is discussed in this paper.

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1. Notation: P parent; M mother; F father; G sibling; Z sister; B brother; C child; D daughter; S son; E spouse; H husband; W wife; e elder; y younger; X-c cross-cousin; //-c parallel cousin; = has the same kin term; ≠ has a different kin term; G^{+1} parents' generation; G^{-1} children's generation; G^0 Ego's generation.

2. Dravidian systems are distinguished from Iroquois by terminological equation of cross-kin with affines, by prescriptive cross-cousin marriage, and by opposite classifications (as parallel or cross) of children of Ego's male vs. female cross-cousins, and of Ego's parents' same-sex vs. opposite-sex cousins (Godelier et al. 1998:9). Iroquois systems allow marriage with cross-kin without prescribing it.

3. Semi-complex and AXCM are not the only modes of reorienting alliance pathways: Iroquois and Cheyenne systems disperse alliances via "cross-parallel neutralization" (Dousset 2012; Trautmann 2012). (Cheyenne systems are identical to Iroquois except for G^0, in which all siblings and cousins are equated.) Moreover, the "elementary" nature of Dravidian systems refers to marriage rules, not social evolution or societal size. South Indian Dravidian systems sustain large kingdoms, for example (Trautmann 1981).

4. Fison first discovered this in Fiji in the 1860s (Gardner and McConvell 2015:88–90).

5. AXCM may be present without Crow-Omaha skewing, as Parkin (2018) has recently emphasized for Indonesia and Sumatra. However, Trautmann's restoration of a relationship between AXCM and Crow-Omaha (without the necessity of a transition) remains heuristically valuable for variations discussed below.

6. The following analysis derives from the Austkin database (Dousset et al. 2010).

7. Previous surveys (Driver and Massey 1957; Lesser 1929; Murdock 1949, 1955, 1967; Spier 1925) inform this discussion, although none focus directly on languages. We draw extensively from the *Handbook of North American Indians* (Wm. Sturtevant, general editor, Washington DC: Smithsonian Institution), whose map of languages and language families at European contact (Goddard 1999) forms the basis of Figure 4. The *Handbook* should be consulted for maps of historical ethnolinguistic territories and population movements noted in our discussion, and for California see also Golla 2011. For maps of archaeological cultures see Coe et al. 1986.

8. Almost all Southeast societies, except for pockets of Cherokee, Choctaw, and Seminole, were forcibly removed to "Indian Territory" (Oklahoma) in the 1830s. Discussion of their Southeastern locations is largely retrospective.

9. Tunicans were absorbed socially by Natchez after 1731, although some speakers remained into the twentieth century (Haas 1939:605). Natchez was the only Mississippian chiefdom to survive into the early colonial period (Galloway and Jackson 2004). Natchez kinship has proven paradoxical owing to confusion among early French sources, and later social absorption first by Chickasaw, and then Creek and Cherokee groups (Galloway and Jackson 2004:602–3; Haas 1939; Swanton 1928:91–96). Natchez matriclan names are inferred as later Creek borrowings (Haas 1939:600). While Natchez nomenclature is structurally similar to Creek, its core equation (*ʔištuw*: FZ=FZD=FZDD) differs signally in not including FM (Haas 1939:607–9), suggesting a distinct earlier system of Lounsbury's (1964b) Crow Type I or II, but not III (to which Creek belongs). Galloway and Jackson (2004:602–3) infer that Natchez (and Taensa, Chitimacha, and Tunican) represent an unusual Crow variant, with ranked

matrilineal exogamous moieties. Timucua are untraceable after the mid-1700s (Milanich 2004). The only source for Timucuan kin terms is a seventeenth-century catechism: from Swanton's (1916) analysis, Spier (1925), Lesser (1929), and Murdock (1967) argued Timucua had Crow skewing, although Spier (1925:74) hedged. In Swanton's presentation of the data, FM=FZ and MBC=C are the only salient equations. If not an isolate, Timucua may have been Muskogean (Milanich 1996). Inferred Timucua matriclans were like neighboring Creek (Milanich 1996; Swanton 1916). For a summary of Southeast languages, see Goddard 2005.

10. Bruner (1955) indicates similar neutralization of crossness occurring in Mandan-Hidatsa kin terminology in the 1950s, which he associates with acculturation by younger generations to Anglo-American kinship norms.

11. Native California suffered massively from nineteenth-century settler-colonialism and population loss (ca. 75% for a single 1833 malaria epidemic; Baumhoff 1963:17): evidence of kinship systems is uneven.

12. Some Yokuts dialects (Gashowu, Chukchansi) in the Sierra Nevada foothills are the exception here: skewed MB=MBS is *nu'ho* or *no'ho* (Gifford 1922:83–84), clearly non-cognate with *akash*/*agas*/*kokwat* (the term among other Yokuts groups). But *nu'ho*/*no'ho* appears similar to *nau*, the term used by the Western Mono, their (Uto-Aztecan) neighbors, for F and FB (Gifford 1922:51–52). There was extensive cultural borrowing between Foothill Yokuts and Western Mono (e.g., Gayton 1945). That this unusual Yokuts MB term may have been adopted from the Mono F/FB term correlates with stage 4 of McConvell's phased model (Table 1) in which a new MB term is borrowed from a neighboring group (here, of a different language family). And the shift in uncle meaning from (Mono) patrilateral to (Yokuts) matrilateral is consistent with a pattern of intertribal marriage exchanges.

13. Some later assessments reemphasize the value of attending to the secondary marriage rule as an expression of the substitutability of lineal affines vis-à-vis Ego's lineage (Barnes 1984, Parkin 2019). Note that we are not addressing the argument over "prescriptive" vs. "preferential" AXCM (for which, see, e.g., Forth 2008; Parkin 2018).

14. This appears true for the Australian Crow cases also.

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