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"GENERATIVE CROW-OMAHA TERMINOLOGIES"**

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FRANKLIN TJON SIE FAT'S COMMENT ON D. READ "GENERATIVE CROW-OMAHA TERMINOLOGIES"

FRANKLIN TJON SIE FAT

It is always a pleasure to read any of the ongoing elaborations of Dwight Read's framework for the formal analysis of kinship terminologies. This exploratory case study of the Thonga-Ronga terminological system raises a number of important issues concerning the specificities of skewing as well as the encompassing methodology of Read's generative logic program for kinship analysis.

Before preparing these notes, I read the comments by Trautmann and Whitely. I then made revisions after receiving the contributions of McConvell, and Heady. This final version was written after reading Hamberger's paper and after communicating directly with Heady. I first comment on Read's framework for the analysis of a kinship terminology's *generative logic*. I then argue (as other respondents have) for embedding the analysis of Thonga-Ronga skewing within the context of a more locally constrained field of comparison. I conclude with specific suggestions for comparing kinship models and their underlying generative logics as variants and transitions situated within an abstract *morphospace*.

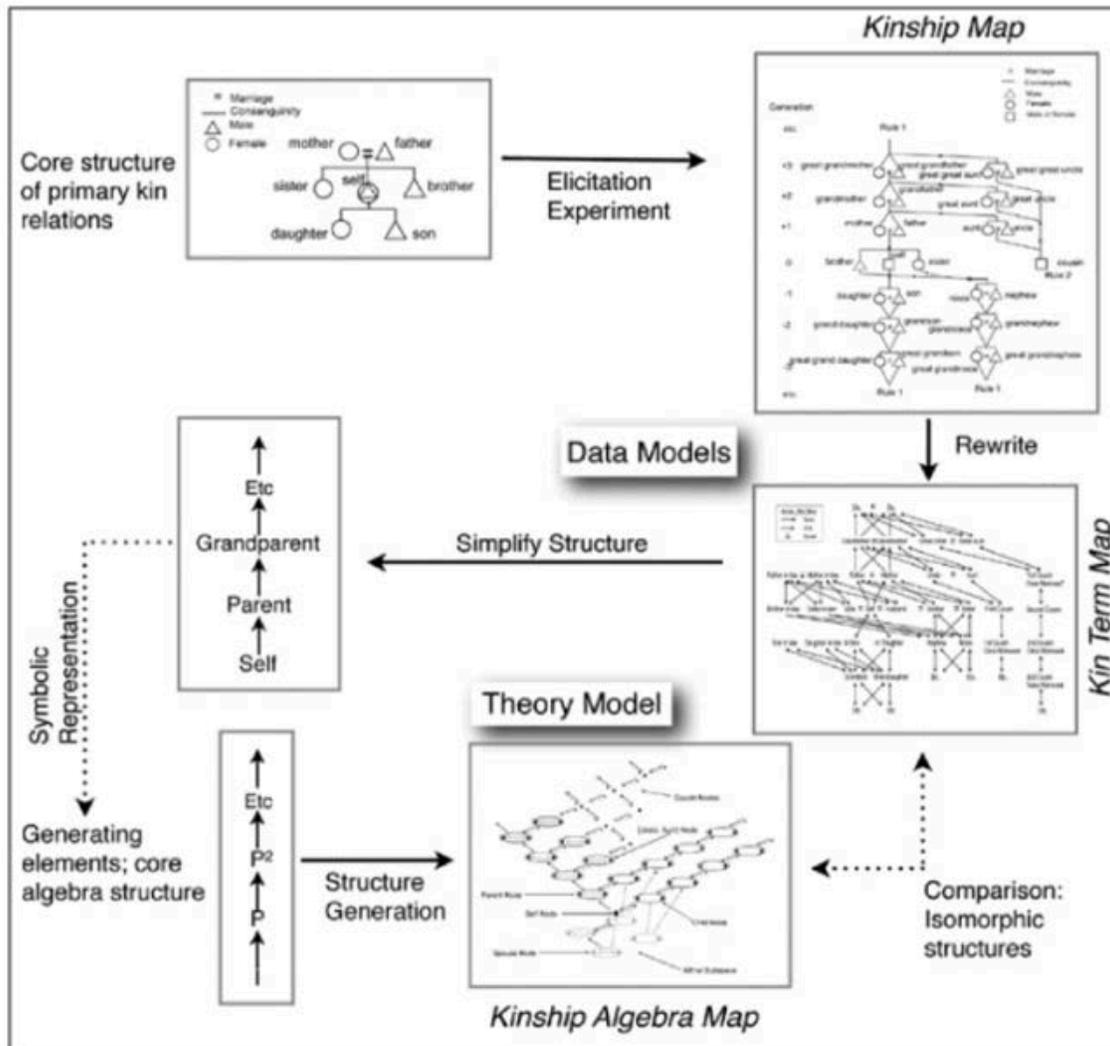
Scientific representations: primary terms, compositions, maps and models

In a previous publication (Leaf and Read, 2012), after obtaining the *core structure of primary kin relations*, a *kinship map* is derived by means of an *elicitation procedure* based on two assumptions: "First, the fundamental logical fact of reciprocity, which entails that every "self" is also "other" to those in other positions and every "other" is also a self—to themselves. Second, the fact that every such self must have the same direct relation" (2012: 140). This elicitation procedure is apparently universally applicable, and premised on an assumption of *homogeneity*: there are no privileged points of view in a kinship system—every "self" and every "other" are equal. Read's full procedure is summarized in the key to his Figure 5.1 (cited below).

"The analysis begins with the elicitation of kin terms using the structure of the primary kin terms (upper left) as the eliciting frame. The elicited structure is shown as a kinship map (upper right) that shows the way in which potential kinship relations are collapsed together under each named position during the elicitation. The kinship map is rewritten as a kin term map to show the structure of kin terms (middle right). Both of these are data models. The kin term map is simplified to determine its core structure (middle left) and the structure is represented symbolically to make it amenable to analysis as an algebraic structure (lower left). The core algebra structure is used to generate a kinship terminology as a theory model (lower right) and the generated terminology is compared to the kin term map to determine if they are isomorphic.

The data model and the theory model are isomorphic for the American kinship terminology” (Leaf and Read, 2012: 133).

This bottom-up procedure raises a number of questions. First, in the Thonga-Ronga analysis, no *kinship maps* are provided, with the *kin term* maps of Figures 1, 2, 3, 4 and 5 apparently derived from Junod’s kin term/genealogical [= kintype] data in Table 1 by taking *kin term products* of the Thonga *primary terms*. The set of primary terms is culturally determined, their use as a generative set is apparently only circumscribed by a relative product operation assumed to be valid for any system of terms. Furthermore, in this paper the Thonga-Ronga analysis is not taken to the level



Leaf and Read (2012), Figure 5.1

of a *kinship algebra map* (described by Read as a *theory model*—as opposed to *kinship map* and *kin term maps* as *data models*). Comparison of the Thonga with, say the Fox (Iroquois) terminology (see Figure 8) is thus by means of *kin term maps*. Should not any comparison (specifically, on aspects of skewing) be undertaken at the level of *kinship algebra maps* (i.e., at the level of *theory models*)? What is the motivation for comparing *theory model* and *data models* as *isomorphic* structures? Does the information summarized in *kin term* data models (and based, potentially, on different, culturally specific generative logics) really articulate the best level for comparison (i. e., between the Thonga-Ronga and the Fox/Omaha terminologies? I find it difficult to delineate the culture-specific aspects of Read’s analysis from the more universal aspects assumed for all generative logics.

A more specific critique: even if a valid procedure for selecting a set of culturally significant primary terms could be developed (for data presented in the usual kin term/kin type format; see Table 1), under the standard assumptions (and presumably in Read’s procedure) the composition of relations (in the *Data Models* as well as in the *Theory Model*) is assumed to be completely *associative*, an assumption questioned in previous research on “crossness” (see Tjon Sie Fat, 1998). Composition of kinship terms (even if limited to some set of primary terms) is always partial, giving partial structures and partial models. In my view (biased, I must confess, towards the so-called *Semantic View* of theories¹), such partial models of phenomena must be *embeddable* in a more encompassing, more complete formal model, i. e., isomorphic to *part* of such a model (van Fraassen, 2013, p. 247; see also Da Costa and French, 2003). Comparison of (partial models of) the Thonga-Ronga and Fox/Omaha terminologies does not take place directly, but through their respective embeddings within the more comprehensive framework of the formal model.²

In fact, compositions of kin terms are sometimes directly available as primary data provided by informants, without the (for me) problematic identification of primary terms by the anthropologist. I refer to the fascinating data on societies with *trirelational* or *triangular* kinship terms (a subject on which McConvell is eminently qualified; see McConvell and Obata, 2006; see also the references in Gaby and Singer, 2014). Briefly, such systems involve three binary kinship relations, 1. between a speaker and an addressee, 2. between the speaker and a referent, and 3. between the addressee and the referent. In triangular systems, a relation is generally computable from any other two. There is actually a site (<http://anu-kdb.katalyst.com.au>) produced by the Bininj Kunwok Language Project—a community-based Indigenous language maintenance project funded by the Australian Government’s Indigenous Languages Support program, where you can learn the composition of Bininj Kunwok triangular relationships. To my knowledge triangular systems have not yet been subjected to a formal, algebraic analysis. In relation to Read’s procedure, the point I am making is that in triangular systems the basic set of terms as well as their compositions are given directly, leading to culturally relevant, partial structures for which the particular form of

¹ For a discussion of the primary sources see Winther, 2016; Suppe, 1989; Stegmüller, 1976.

² For Read’s composition of terms, it might be helpful to explore the more general concept of *partial operations* (Ljapin and Evseev, 1997), and the availability of different forms of associativity to be put into effect (weak associativity, strong associativity, catenary associativity, intermediate associativity, etc.).

associativity may be analyzed, not defined *a priori* as a universally valid part of the generative logic. For me, Read's analysis would be more convincing if it could be applied to compositional data obtained directly from informants (possibly by a data-collection procedure similar to the classic "triad test" in psychology).

On the necessity of a regional context for comparison: positioning the Thonga

Trautmann and Whiteley question the decision to compare the Thonga-Ronga with "widely disparate" terminologies, arguing for the close study of variation among the kin terminologies of neighboring groups. I concur. I am, of course, strongly biased, having taken a degree at Leiden University. For the pre-war "school" of Leiden anthropology, their comparative research program was made explicit in the 1935 Inaugural Lecture of J. P. B. de Josselin de Jong: "*The Malay Archipelago as a field of ethnological study*". The research paradigm articulated a "structural" core, with specific emphasis on the comparative interrelationship between marriage structures, descent, and dualism within a holistic framework (cf. Fox, 1988). Kinship models are seen as a system of a system of transformational variants encompassed by a formal model predicated on marriage exchanged and the possibility of double-descent rules (see Tjon Sie Fat, 1990). The regional-comparative paradigm was reformulated in the 1970's (now with a focus on Southern Africa) in Adam Kuper's Inaugural Lecture (reprinted as Kuper, 1979).

Kuper's publications, in particular his 1982 book *Wives for Cattle*, have direct relevance for Read's Thonga analysis. According to Kuper (1982), "The regional approach encourages the study of concomitant variation, structural transformation, and historical change while imposing a sense of the context and meaning of cultural practices". Politics, alliance, bridewealth, kinship terminology and diachronic transformations are analysed and compared for the Tsonga (Read's Thonga-Ronga), the Swazi, the Venda, and the Lovedu (amongst others). As mentioned by Kuper, and by Trautmann and Whitely, some of these systems suggest "Omaha" skewing, others "Iroquois" crossness and no skewing, yet others are "Hawaiian". As analysed by Kuper, the marriage and exchange structures range from "marrying in" (the Lovedu), cross-cousin marriage variants (the Venda), "marrying up" (the Swazi), and "marrying out" (the Tsonga), apparently scattering marriage links in a characteristic feature of "Omaha" systems.

I agree with Trautmann and Whitely, and McConvell: Read's Thonga-Ronga generative logic and his discussion of skewing (as a direct logical consequence of a system's generative logic, as a transformation from an "Iroquois" system, or due to something completely different...) should really be tested in first instance against culturally related neighboring societies with cognate kinship terms, and a range of marriage transformations.

Extending Read's model: comparison and change in the morphospace

Trautmann and Whitely's mention of our old "hypercube" model (Godelier et al., 1998: 10-12, 18-25) reminded me of the lengthy discussions (and the reams of fax paper exchanged) after the 1993 Maison Suger conference on variants of "crossness". The "hypercube" was an attempt to embed

various forms of “crossness” in a geometrical diagram suitable for comparison of their underlying logical structure, and for describing possible developmental trajectories. Our model is a much simplified and incomplete example of what would now be considered a *morphospace* analysis. It is also directly related to van Fraassen’s “state space” or “phase space” implementation of the Semantic Approach (van Fraassen, 1987, 1989, 2013; Lloyd, 1984, 1988).

In my opinion Read’s generative logic of Crow-Omaha terminologies can (and should) be extended in a similar manner and for the same reasons: to facilitate comparison, and visualize the developmental possibilities of variant logics.

McGhee (2007, 2015) defines theoretical morphospaces as n -dimensional geometric hyperspaces produced by systematically varying the parameter values of a geometric model of form. Sewall Wright first presented his “adaptive landscape” diagrams in 1932 as networks of relationships between different gene combinations. For two combinations of paired allele-morphs, the 2-dimensional space consists of four states or possible locations; for three combinations, the 3-dimensional space gives eight states, for four combinations, the 4-dimensional space provides sixteen states, etc. In general, for n binary-valued distinctions, the resulting n -dimensional space will comprise 2^n distinct states (Wright, 1932). More precisely, Wright’s n -dimensional landscapes are *Hamming graphs*, connecting all states differing by a unit *Hamming distance*.³

In the 4-dimensional hypercube presented in Godelier et al. (1998; Figure 1.3 and Table 1.1), different types of “crossness” are distinguished by means of four binary-valued parameters in the formal model that reflect the opposite ways “crossness” is assigned to the class of “parents”-“cousins” and “cousins”-“children”. The Iroquois and Dravidian structures are located at maximum distance (4 links) from each other in this space, with the Kuma and Yafar (or Red Knife) structures midway between them. The model demonstrates that there are exactly 24 different paths to take between Iroquois and Dravidian, with each step between nodes representing one reversal of a feature of “crossness” (see diagram below, left). In a second, more specific and “localized” elaboration of the model, a large subset of the eighty North American kinship terminologies reported in Morgan’s *Systems of Consanguinity* could be allocated to the nodes of this second model (below, right).

I paraphrase the five steps in a theoretical morphospace analysis given by McGhee (2007: 61-63): (1) construct a relevant geometric or mathematical model of morphology itself (or of the processes creating morphology). (2) Generate all possible morphologies by varying the relevant parameters of the model. (3) Construct a theoretical morphospace of hypothetical yet potentially existing morphologies. (4) Find and situate the actually existing forms in the morphospace. (5) Finally, analyse the significance of both the existing and the nonexistent forms in the morphospace.

³ The *Hamming distance* between two [strings](#) of equal length is the number of positions at which the corresponding [symbols](#) are different. In other words, it measures the minimum number of *substitutions* required to change one string into the other (Wikipedia).

It should be possible to develop a suitable morphospace for the analysis of Read's generative logic by making explicit and varying the relevant parameter values of his model. Such an extension to Read's framework should allow for a detailed comparison of specific terminologies, as well as a providing a scheme for analyzing possible diachronic trajectories in the kinship morphospace.

Figure 1-3
Hypercube Modeling Sixteen Variants of Iroquois/Dravidian Crossness

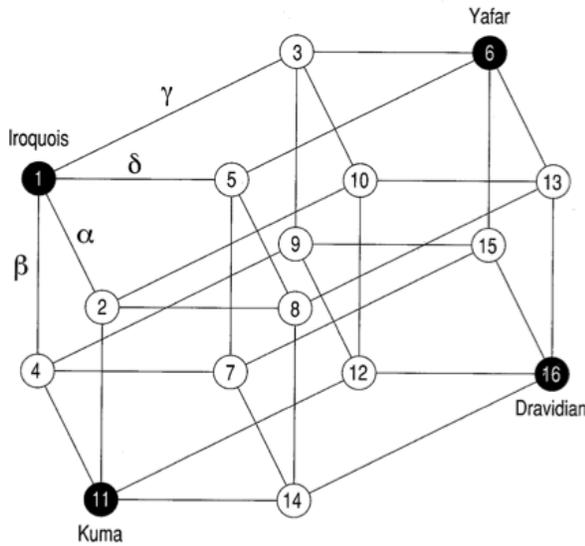
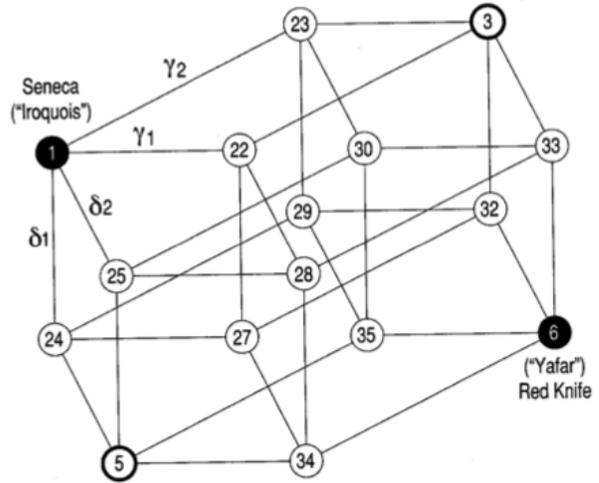


Figure 1-5
Hypercube Modeling Sixteen Variants of Crossness among Eighty North American Systems Reported in Morgan, *Systems of Consanguinity* (1871: Table II)



Source: Godelier et al (1998), Figures 1.3 and 1.5

A final note: cousin terminologies and sibling terminologies (Heady).

After first misreading Heady's table of the relationship between types of sibling terminology and sibling terminology (as identified by Murdock), he kindly provided me with Murdock's original frequency data.

I then grouped the seven *Cousin terminologies* (as suggested by Heady) into three categories, *Descriptive/Eskimo*, *Hawaiian/Iroquois* and *Omaha/Crow/Anomalous*, and carried out a basic *2-dimensional Correspondence analysis* on the grouped data using SPSS 25. The 2-dimensional biplot of the sibling terms/grouped cousin terms are given below. The interpretation of these results is straightforward: points which are close to each other in the 2-dimensional plot are highly correlated, points far from each other are not.

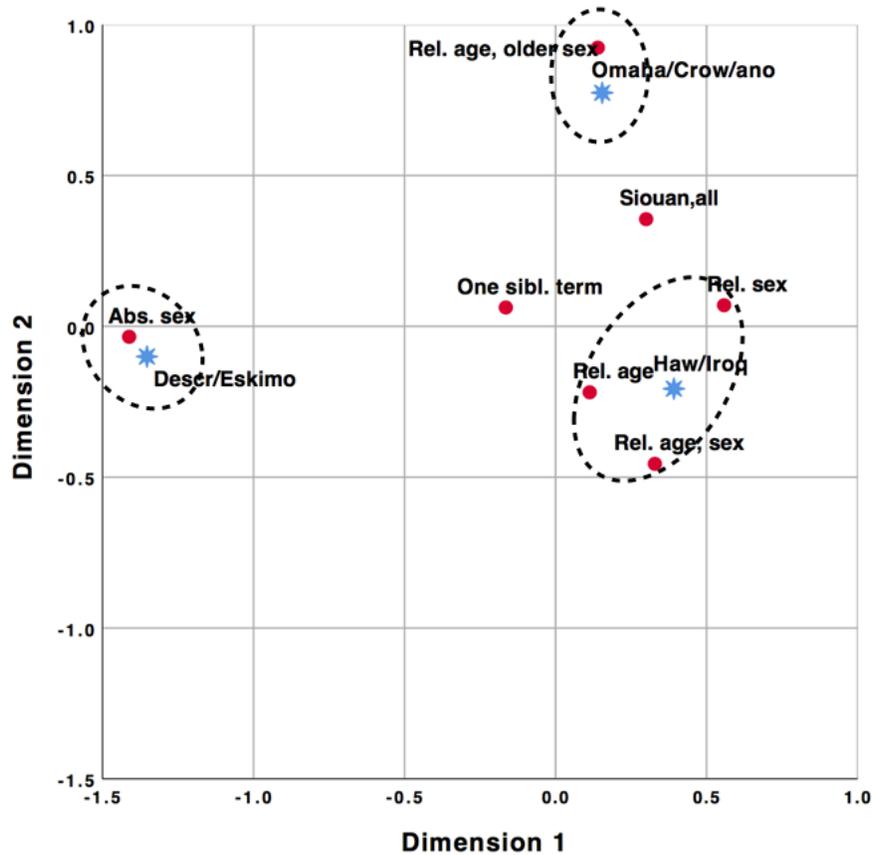
Heady's conclusions are clearly corroborated, with a few additional specifications:

1. *Descriptive/Eskimo* and *Absolute sex* terms are closely associated.
2. *Omaha/Crow/Anomalous* and *Relative age, older sex* terms are also closely associated.
3. *Hawaiian/Iroquois* and sibling terms that make relative distinctions (i.e., *Relative age, Relative sex, Relative age, sex*) are associated.

4. *One sibling term and Siouan, all distinctions* are less closely associated with any of the grouped cousin terminologies.

Finally, the horizontal axis (Dimension 1) differentiates strongly between the grouped *Descriptive/Eskimo* and *Hawaiian/Iroquois* cousin terminologies, with *Omaha/Crow/Anomalous* approximately at the mid point of the horizontal axis. The vertical axis (Dimension 2) differentiates *Omaha/Crow/Anomalous* clearly from both the *Hawaiian/Iroquois* and the *Descriptive/Eskimo* terminologies.

Row and Column Points (Symmetrical Normalization)



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