

**UCLA**

**Mathematical Anthropology and Cultural Theory**

**Title**

THE GENERATIVE LOGIC OF DRAVIDIAN LANGUAGE TERMINOLOGIES

**Permalink**

<https://escholarship.org/uc/item/7dc0m5jj>

**Author**

Read, Dwight W

**Publication Date**

2010-08-01

Peer reviewed

**THE GENERATIVE LOGIC OF DRAVIDIAN LANGUAGE TERMINOLOGIES**

**DWIGHT READ**

**DEPARTMENT OF ANTHROPOLOGY AND DEPARTMENT OF STATISTICS**  
**UNIVERSITY OF CALIFORNIA, LOS ANGELES**  
[DREAD@ANTHRO.UCLA.EDU](mailto:DREAD@ANTHRO.UCLA.EDU)

**COPYRIGHT 2010**  
**ALL RIGHTS RESERVED BY AUTHOR**

**SUBMITTED: MARCH 25, 2010. REVISION SUBMITTED MAY 28, 2010**  
**ACCEPTED: June 10, 2010**

**MATHEMATICAL ANTHROPOLOGY AND CULTURAL THEORY:**  
**AN INTERNATIONAL JOURNAL**  
**ISSN 1544-5879**

## **THE GENERATIVE LOGIC OF DRAVIDIAN LANGUAGE TERMINOLOGIES**

DWIGHT READ

*Abstract: Classificatory (“bifurcate merging”) terminologies with a ‘cross-cousin’ marriage rule are sometimes grouped together as Dravidian terminologies despite significant structural differences among the terminologies so classified. For example, the Kariera terminology has four ‘grandparent’ and ‘grandchild’ terms and does not have an older/younger distinction for ‘cross-cousin’ terms. In contrast, Dravidian language terminologies of India typically have two ‘grandparent’ and ‘grandchild’ terms and make an older/younger distinction for cross-cousin terms. These differences are not superficial and relate both to substantive differences in social organization for the societies in question and the “meaning” of ‘cross-cousin’ marriage. In this paper I develop the generative logic for the Tamil terminology of southern India. This logic underlies the structural features of the Dravidian terminologies such as the parallel/cross distinction used to characterize marriages in societies with Dravidian terminologies. The generative logic structurally distinguishes Dravidian language terminologies from other, superficially similar terminologies such as the Kariera terminology.*

### **1. Introduction**

In this paper I develop the generative logic underlying the terminology used by the Nanjilnattu Vellalar, a Tamil-speaking, agriculturalist caste in India located in the Kanyhakumari district of the state of Tamil Nadu in southern India. In his magnum opus, *Dravidian Kinship*, Thomas Trautmann (1981) selected their terminology as an exemplar of Dravidian terminologies due to minimal likelihood of exogenous influences since the Nanjilnattu Vellalar are a non-Brahmin caste located distant from the Dravidian/Indo-Aryan kinship frontier. For simplicity of reference, I will henceforth refer to their terminology as the NV Tamil terminology (or Tamil terminology, for short), leaving it the reader to remember that there is no single terminology used by all Tamil speakers. The NV Tamil terminology has structural form that matches Trautmann’s prototypic Dravidian terminology, hence results obtained here are not specific to the NV Tamil terminology but provide the generative logic underlying Dravidian language terminologies in general. A key finding in this paper is identification of differences in the generative logic for the Tamil terminology versus other, seemingly similar terminologies such as the Kariera terminology of Australia.

I begin with a brief overview of what is meant by a kinship terminology structure and how such a structure can be elicited and then represented through a kin term map. I then construct a kin term map for the Tamil terminology. Next I discuss the generative logic for the kinship terminology structure displayed in a kin term map. That structure can be represented algebraically; that is, as a structure based on a binary operation (the kin term product -- see below) defined over a set of symbols (the kin terms) in accordance with a general schema for the generation of kinship terminologies subject to terminology specific constraints that account for the structural form of a particular terminology. The latter includes (but is not limited to) general equations for kinship terminology structures (such as equations that express structurally what is meant by reciprocity of kin terms) and equations specific to the terminology in question, with the latter giving the kin term map its specific form.

The algebraic representation allows for a simple, structural distinction to be made first between descriptive and classificatory terminologies such as the American and the NV Tamil terminology and then to make structural differences among classificatory terminologies such as the NV Tamil, the Kariera and the Tongan terminologies. The structural differences stem from the generative logic for classificatory terminologies leading to disjoint structures of male-marked terms and female-marked terms. The different ways these two structures may be joined together to form a single structure give rise to the structural differences among classificatory terminologies. For the NV Tamil terminology, the two structures are joined by linking together their respective male self and female self terms through a marriage link. I then show that the “cross-cousin” marriage rule for Dravidian language terminologies emerges from the logic of how the male- and female-marked structures are joined to form a single structure. This contrasts with, for example, the Kariera terminology for which the marriage rule is necessary to generate the terminology, hence is not emergent. Finally, the structure generated algebraically is shown to be isomorphic to the kin term map for the NV Tamil terminology and predicts affinal relations also included under the ‘cross-cousin terms’. The algebraic machinery makes evident fundamental structural differences between the Dravidian language terminologies and Australian terminologies such as the Kariera terminology. The structural results clarify properties of Dravidian language terminologies discussed in the ethnographic literature, such as the division of relatives into “cross” and “parallel” relatives.

## **2. Kinship Terminology Structures**

A kinship terminology is not simply a set of semantic labels for an already determined classification of genealogical relations (referred to as kin types), but is a system of symbols (the kin terms) that enables culture-bearers to compute kin relations symbolically through what we will refer to as kin term products. The computational system has a structure that can be generated through kin term products subject to conceptual and structural constraints. These constraints express the implicit kinship structural knowledge that culture-bearers have and use when computing kin relations through kin term products -- in the same sense that speakers of a language have and use an implicit grammar when forming meaningful utterances.

For analytical purposes, we can define a kin term product (more formally, a binary product,  $\circ$ , defined over a set of elements) for a pair of kin terms  $K$  and  $L$  to be the kin term,  $M$ , that a speaker would (properly) use for a third person when the speaker (properly) refers to a second person by the kin term  $L$  and that person (properly) refers to third person by the kin term  $K$ . We can formally represent the kin term product of  $K$  and  $L$  by the equation  $K \circ L = M$ . For example, among English speakers, if someone refers to another person by the kin term  $L = \text{uncle}$  and that person refers to a third person by the kin term  $K = \text{son}$ , then the product of son and uncle, denoted son of uncle (or, symbolically,  $K \circ L$ ) is a kin term, if any, that speaker would properly use for that third person. In this example, an English speaker would use the kin term  $M = \text{cousin}$  and so we have son of uncle = cousin (or symbolically,  $K \circ L = M$ ) for users of the English/American kinship terminology (AKT).

Since kin term products refer to the kinds of calculations culture bearers make with kin terms (see ethnographic examples in Read 2001), or what Dumont refers to as “the native way, as imposed by the terminology” (1953:37), we can elicit the structure of kin terms for a kinship terminology systematically from informants (Leaf 2009; Leaf and Read n.d.) without reference to a genealogical space. The elicitation procedure makes it evident that we are dealing with a *system* of kin terms -- forming what we will refer to as a *kin term space* -- based on a computational logic expressed through kin term products. The kin term space is ontogenetically prior to kin term definitions obtained by embedding kin terms in a genealogical space via asking informants to identify the kin terms that would be used for persons in genealogically specified relationships to speaker (see Read 2001, 2010; Bennardo and Read 2005, 2007; Leaf and Read n.d. for a discussion of the conceptual relationship between a genealogical space and a kin term space).

The elicitation method proceeds by first identifying the kin terms -- which we will refer to as primary kin terms -- that identify culturally distinguished positions in a family. For English speakers, these terms consist of the ascending kin terms mother and father (including the covering term, parent), the reciprocal (and hence descending) kin terms son and daughter (including the covering term, child), the horizontal kin terms brother and sister, and, with respect to marriage, the affinal kin terms wife and husband (including the covering kin term spouse).<sup>1</sup> Then we systematically ask, for example, English speakers questions such as: If person A refers to person B by the kin term  $L$  and person B refers to person C by the kin term  $K$  (where  $K$  is one of the

---

<sup>1</sup> The English terms distinguished in this manner are polysemic. One meaning of the term “mother” is that of a *relation* between speaker and the female who begat speaker. This relation may be extended recursively via constructions such as speaker’s mother’s mother. Similar comments apply to recursive usage of the other primary terms. The recursive usage of the primary terms leads to genealogical tracing and a genealogical space (what Lehman and Witz 1974 refer to as the Primary Genealogical Space). The other meaning of the term “mother” is that of a kin term with reference to the cultural concept of mother and in this usage kin term products are used to form new kin terms; e.g., mother of mother = grandmother, mother of grandmother = great grandmother, and so on. Similar comments apply to kin term products of the other primary kin terms, including cultural constraints such as mother of father = grandmother, mother of grandfather = great grandmother, and so on. Kin term products of the primary terms leads to a kin term space. When necessary for clarity, we will use the expression “genealogical mother” when the genealogical relation is meant as opposed to the kin term meaning of “mother.”

The two spaces are linked through cultural instantiation of the primary kin terms as genealogical relations; e.g.,

terms associated with the family positions, such as “mother” in the AKT) then what kin term  $M$  does speaker use properly to refer to person  $C$ ? We use the responses to these queries to construct a kin term map for the terminology by first letting each primary kin term be a node in the map and then letting each kin term,  $M$ , elicited in this manner be the label for another node. Nodes are connected by arrows (whose form is specific to the primary kin term,  $G$ , being used to construct products) going from the node labelled by the kin term  $K$  to the node labelled by the kin term  $M$ , where  $G \circ K = M$ .

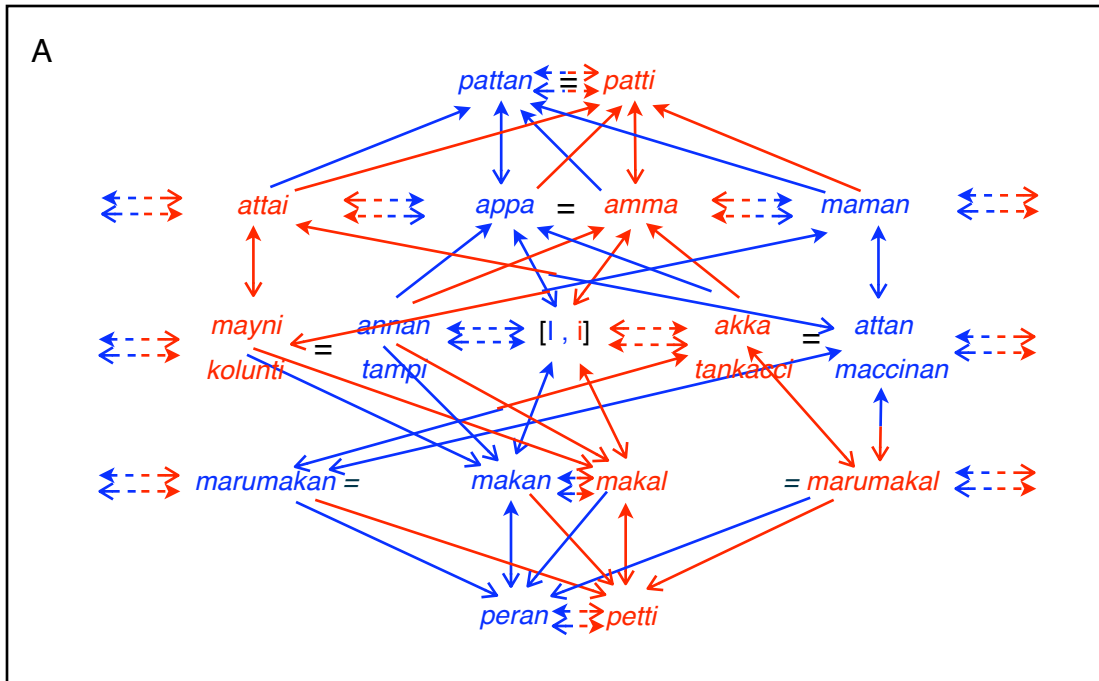
Eventually we reach a conceptual boundary (Leaf 2009) as indicated by one of the following four possibilities: (1) a product  $G \circ K$  does not yield a kin term,  $M$  (e.g., in the AKT father of father-in-law does not yield a kin term), (2) repeated products with  $G$  generate a systematic sequence of kin terms (e.g., in the AKT father of (great ... grandfather) is great great ... grandfather, where the systematicity is denoted through adding the expression “great”), (3) the product is reflexive (e.g., in the AKT brother of brother is brother, where brother is son of parent) or (4) the structure is circular (e.g., ‘father’ of ‘grandfather’ is ‘grandson’). The kin term map constructed in this manner is conceptually bounded, hence well-defined. In brief, repeatedly taking kin term products with the primary terms generates a structure that has boundaries either of the form “not a kin term”, “continue with kin terms indefinitely but in a systematic manner,” or “the product is reflexive.”

### 3. Kin Term Map for the Nanjilnattu Vellarlar Tamil Kinship Terminology

Now let us use these ideas to form a kin term map for the NV Tamil terminology (see Figure 1A, B), using the kin term data provided by Trautmann (1981:Figure 2). The NV Tamil structure corresponds to what Dumont (1953) and Trautmann (1981) consider to be the prototypic form for a Dravidian terminology in India. The NV Tamil terminology is a classificatory terminology and the primary terms are (1) *appa* (‘father’) with reciprocal term *makan* (‘son’), (2) *amma* (‘mother’) with reciprocal term *makal* (‘daughter’), (3) *annan* (‘older brother’) with reciprocal term *tampi* (‘younger brother’) or *tankacci* (‘younger sister’) depending on sex of speaker, and (4) *akka* (‘older sister’) with reciprocal term *tankacci* (‘younger sister’) or *tampi* (‘younger brother’) depending on sex of speaker. The symbol “[I, i]” denotes the self position (discussed in

---

the kin term mother is instantiated as the set (or category) {genealogical mother}, the kin term father is instantiated as the set {genealogical father}, and so on (see Read 2007 for details). This linkage leads to predicted genealogical definitions of kin terms that (for the several terminologies where the predictions have been carried out) are in complete agreement with the empirically determined genealogical definitions of kin terms. Unlike methods such as Rewrite Rule Analysis that begin with the genealogical definition of kin terms, there is no *a priori* reason why the predicted genealogical definitions must match the empirically derived definitions unless the categorization of genealogical positions is derived from the logic of the kin term space. This, of course, contradicts the long-standing assumption going back to Lewis Henry Morgan that kinship is primarily about categories of genealogical relations and secondarily about the relationship of kin terms to genealogy (Read 2007).

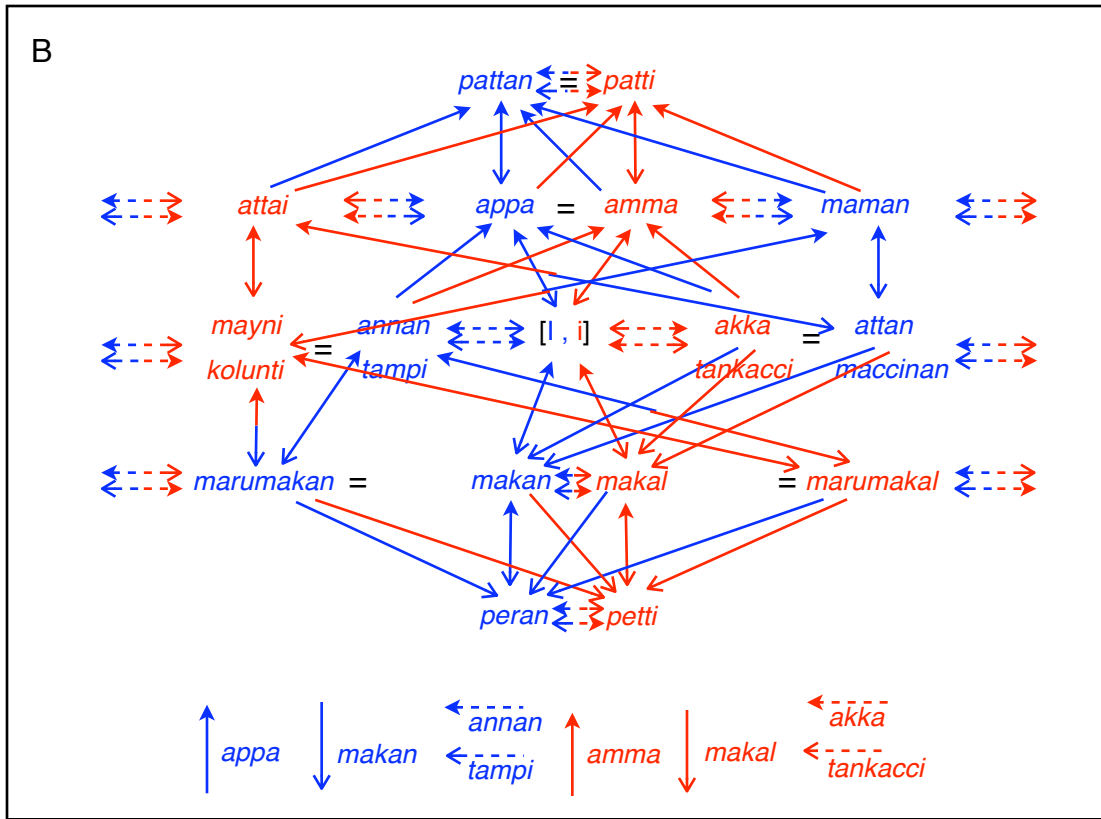


**Figure 1A:** Kin term map for the NV Tamil terminology. Map from the perspective of male self. Arrows on the extreme right and left side of (A) and (B) wrap around to the other side. Reflexive arrows not shown. The key to the arrows is shown below Figure 1B. Solid arrow heads are ascending generating terms and open arrow heads are descending generating terms. The “=” denotes terms connected by a kin term product with a spouse term.

more detail below) with instantiation as the person who is the point of reference for the referential usage of the terminology. Terms such as *periyappa* (‘big father’) and *cinnappa* (‘little father’) have not been included for the same reasons they were excluded by Louis Dumont (1953) in his seminal analysis of Tamil terminologies; they are not generated through kin term products but are constructed in Dravidian terminologies by adding a prefix meaning “big” or “little,” to the ‘father’ or ‘mother’ kin term (Rao 1982; Trautmann 1981). As Traumann notes, expression such as *periyappa* do not have reciprocal forms and instead have *makan* and *makal* as common reciprocals “implying the fundamental unity of F, FeB, and FyB” (1981:37; similar comments apply to M, MeZ, and MyZ).

#### 4. Descriptive versus Classificatory Terminologies

The first property we need to work out is the structural logic that leads to the difference Lewis Henry Morgan made between descriptive and classificatory terminologies. The distinction is often expressed by the genealogical equations  $fb = f$  and  $mz = m$ , which are understood to mean that the kin term ‘father’ applies equally to genealogical father (f) and genealogical father's genealogical brother (fb). A similar comment applies to the second equation. But this gives unwarranted priority to genealogy whereas we need to express the difference between descriptive and classificatory terminologies through the logic of kin term spaces.



**Figure 1B:** Map from the perspective of female self. The two perspectives are the same except for terms in the -1 generation. Horizontal arrows on the extreme right and left side of (A) and (B) wrap around to the other side. Reflexive arrows not shown. Solid arrow heads are ascending generating terms and open arrow heads are descending generating terms. The “=” denotes terms connected by a kin term product with a spouse term.

Elsewhere (Read 2007; Read and Behrens 1990; Bennardo and Read 2005, 2007; Leaf and Read n.d.) I have shown that the structural difference between descriptive and classificatory terminologies may be structurally expressed by whether the kin term structure is generated from a single ascending kin term (such as parent in the case of the AKT) or is generated by an ascending kin term and a horizontal (sibling) kin term (such as *appa* or *annan* for the Tamil terminology). A term used to generate a terminology will be called a *generating term*.<sup>2</sup> The distinction between these two sets of generating terms is whether, as in the AKT, brother and sister are compound terms, namely son of parent = brother and daughter of parent = sister, or whether a sibling term such as *annan* in the NV Tamil terminology, is a primary, hence an irreducible, kin term.

Core properties of kinship terminologies are: (1) every terminology has a self concept (whether or not it is recognized as a kin term) and the self concept may or may not be sex marked depending on the kinship terminology, (2) kin terms come in reciprocal pairs, and (3)

<sup>2</sup> Not all primary terms are generating terms. In the AKT, for example, the ascending primary terms are mother, father and parent, but only parent is a generating term (Read and Behrens 1990; Read 2001).



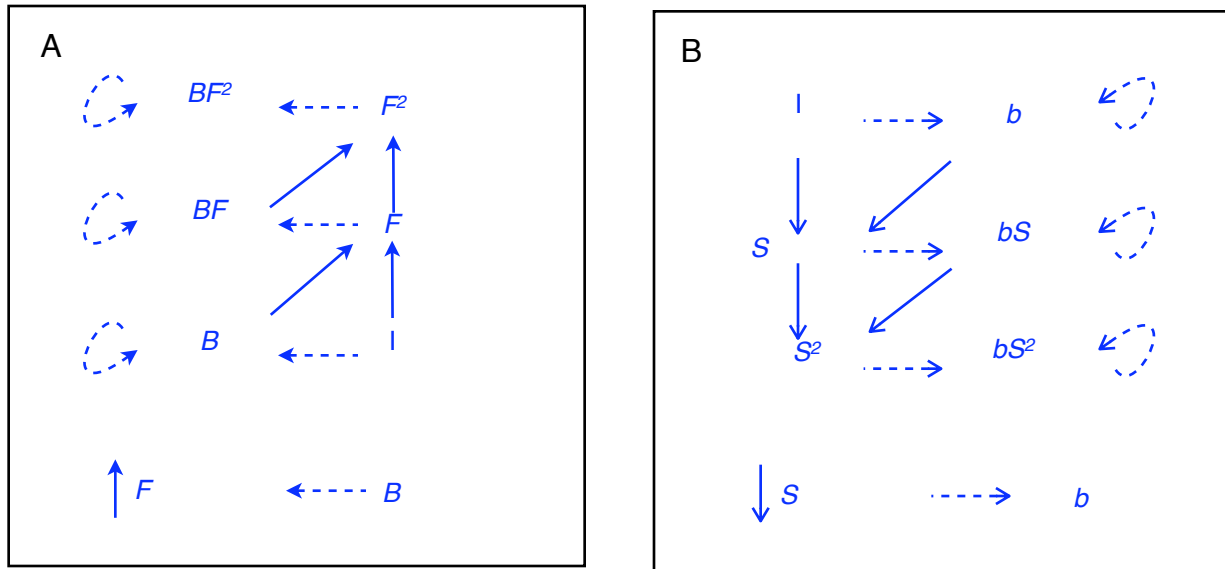
there is a regular process by which a terminology can be generated: (a) begin with a structure of ascending kin terms, (b) then form an isomorphic structure of descending terms, (c) next structurally introduce sex marking of kin terms, (d) introduce affinal kin terms, and (e) include culturally salient, local modifications of kin term structure. Details and rationale for this procedure can be found in Bennardo and Read (2005, 2007) and Leaf and Read (n.d.). For our purposes here, we will only carry out the portion of the generative process for classificatory terminologies that make evident the logical basis for the structural property of classificatory terminologies whereby the kin term products ‘older/younger brother’ of ‘father’ = ‘father’ (and similarly for ‘sister’ and ‘mother’) are part of the kin term space, as well as the logic underlying the “older/younger” distinctions among sibling terms, including the way the “older/younger” distinction is variably expressed in classificatory terminologies (see Read 2010).

### 5. The Generative Structure for Classificatory Terminologies

The key to the structure of the Tamil terminologies lies in the differentiation we find among classificatory terminologies for how the disjoint core structures of sex-marked kin terms are joined together to form a single structure of kin terms. To date, three distinct ways this may be done with classificatory terminologies have been identified. One of these leads to the structure of Dravidian language terminologies such as the Tamil terminologies in which there is an older/younger distinction for ‘cross-cousin’ kin terms as well as for sibling terms in the 0 generation kin terms. To identify the different ways the core structures of male- and female-marked terms may be linked to form a single structure, we generate a core, ascending structure for classificatory terminologies based on  $\{I, F, B\}$  as the set of generating elements. For this set of generating elements,  $I$  has interpretation as “male self” (and is an identity element in this structure, corresponding to the fact that self is an identity element for kin term products),  $F$  has interpretation as the kin term ‘father’ and  $B$  has (initially) interpretation as the kin term ‘male sibling.’

#### 5.1 Ascending Structure

The form of the ascending structure (Figure 2A) generated from these elements is determined by the structural equations: (1)  $FB = F$  (read “the kin term product ‘father’ of ‘brother’ is the kin term ‘father’”), (2)  $BB = B$  (a structural equation defining  $B$  to be a sibling element) and (3)  $F^3 = 0$ , a boundary condition. This boundary condition can be expressed differently, if need be; e.g.  $F^3 = F^2$  is another possible boundary condition. Eqs. (1) and (2) structurally identify  $B$  as a sibling element. Note that  $BF$  and  $BF^2$  are distinct elements in the structure being generated since there is, as yet, no structural equation such as  $BF = F$  for reducing the product  $BF$ . What we have generated is the core structure of ascending kin terms for classificatory terminologies.



**Figure 2:** (A) Ascending structure based on generating elements  $I$ ,  $F$  and  $B$ , with interpretation male self, ‘father’, and ‘ascending male sibling’. (B) Descending structure isomorphic to the ascending structure. Generating elements are  $I$ ,  $S$ , and  $b$  with interpretation male self, ‘son’ and ‘descending male sibling.’

Note that the concept of generation, one of the four dimensions for Dravidian terminologies distinguished by Louis Dumont (1953), is embedded in this structure through the sequence of elements  $I$ ,  $F$ , and  $F^2$ .

### 5.2 Descending Structure

The descending structure (Figure 2B) is an isomorphic copy of the ascending structure (see discussion in Bennardo and Read 2005, 2007; Leaf and Read n.d.) and is generated by forming an isomorphic set of generating elements (that is, a set with the same number of elements but where at least one of the elements in the isomorphic set is not the same as any element in the original set) and isomorphic structural equations. Let the descending structure be generated by the isomorphic set of elements  $\{I, S, b\}$  with isomorphic structural equations (1')  $Sb = S$ , (2')  $bb = b$  and (3')  $S^3 = 0$ . (Another possible isomorphic set of generating elements would be  $\{I, S, B\}$  for the descending structure and is the basis for the Tongan, East Uvea, Niue, and Tokelau terminologies among the Polynesian kinship terminologies; see Read 2010).

### 5.3 Ascending and Descending Structure; Reciprocal Elements

These two structures become a single structure via the common element  $I$ . Structural equations  $FS = I$  and  $SF = I$  are added to this single structure to define  $S$  and  $F$  as reciprocal elements. Note that the concept of kin term reciprocity is expressed structurally for generating kin terms by an equation of the form  $K \circ L = I$ , where  $K$  is an ascending generating term and  $L$  is its reciprocal term and  $I$  is the identity, or self, element and need not be sex marked. For the AKT, the generating terms parent and child for the ascending and descending structures, respectively, are

structurally defined to be reciprocal terms through the equation, parent of child = self. The equation, child of parent = self, is not included in the AKT, for if it were the terminology would not have collateral kin terms.

We add the structural equations  $Bb = I = bB$  to make  $B$  and  $b$  reciprocal elements. Observe that the construction procedure leads to two elements,  $B$  and  $b$ , in the structure we have just generated, which is the second dimension distinguished by Dumont (1953) for Dravidian terminologies. These two elements usually have interpretation as ‘older brother’ and ‘younger brother,’ though ‘ascending brother’ and ‘descending brother’ are more accurate transliterations given the way the elements  $B$  and  $b$  are introduced into the structure (see Read 2010 for a discussion of how the choice of an isomorphic generating set for the descending structure affects whether and how an “older/younger” distinction will be made among the sibling kin terms). In fact, these terms are sometimes used in violation of the assumed relative age distinction with respect to ego for the sibling terms; e.g., in Tongan *tokoua* is used for genealogical son of genealogical father’s older genealogical brother regardless of the age difference of the referent with respect to speaker.

#### 5.4 Classificatory Kin Term Products

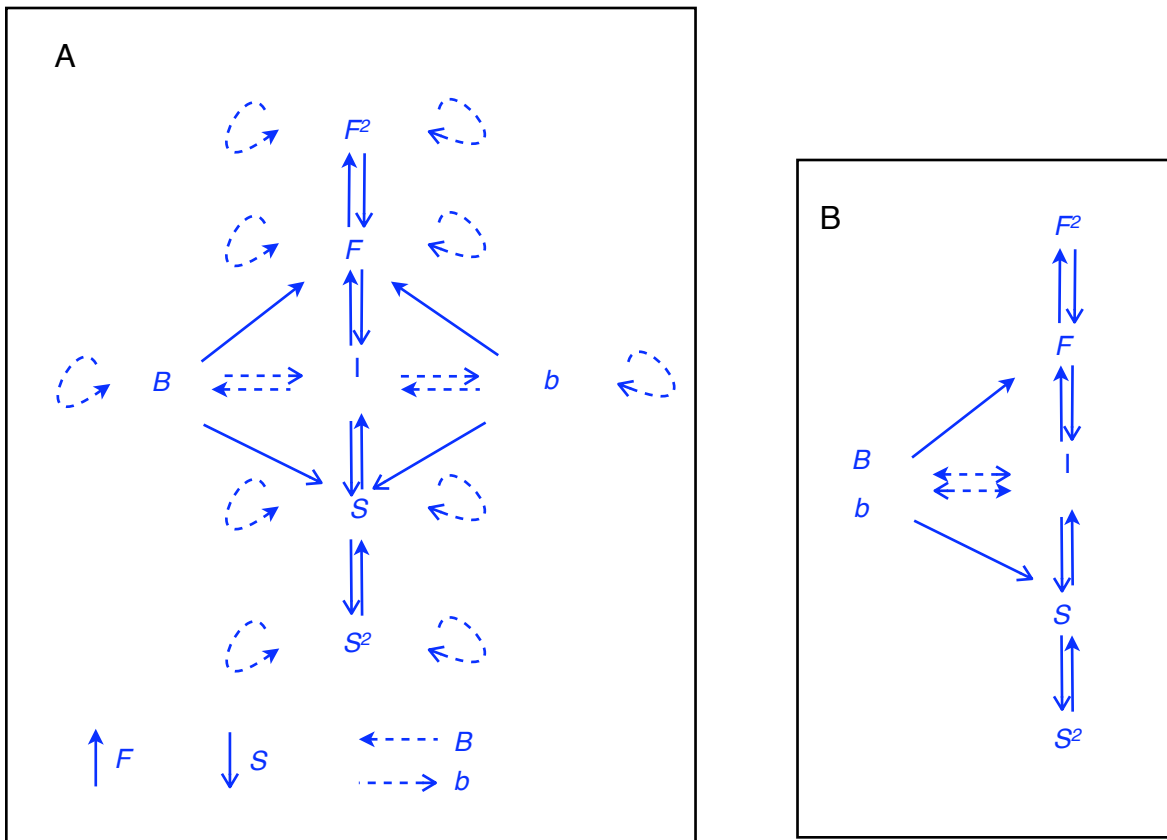
The equation  $Sb = S$  has reciprocal equation  $BF = F$  based on what seems to be a universal property of kinship terminologies; namely, when an equation is part of a kinship terminology structure, its reciprocal equation is also part of the kinship terminology structure. This yields the classificatory property that ‘older brother’ of ‘father’ = ‘father’ as a logical consequence of ‘brother’ being a generating term and the general property of forming a descending structure as an isomorphic copy of a structure of ascending terms.

We easily derive that  $bF = F = BF$  and  $BS = S = bS$  (see Read and Behrens 1990; Bennardo and Read 2005, 207; Leaf and Read n.d. for details), hence the “older/younger” distinction does not logically carry over to the +1 and -1 generations. (To simplify notation, when we have pairs of equations such as  $bF = F = BF$ , we will use the notation  $B^*F = F$  in place of  $bF = F = BF$ . A similar comment applies to  $B^*S = S$ . We will write  $B^*X$  in place of the equation  $BX = bX$ , where  $X$  is a kin term that need not be sex marked.)

We now have the core structure for a classificatory terminology (Figure 3A) based on generating terms with a single sex marking such as male marked kin terms. Next we need to expand the structure to include terms with male sex marking and terms with female sex marking.

#### 5.5 Sex Marking of Kin Terms

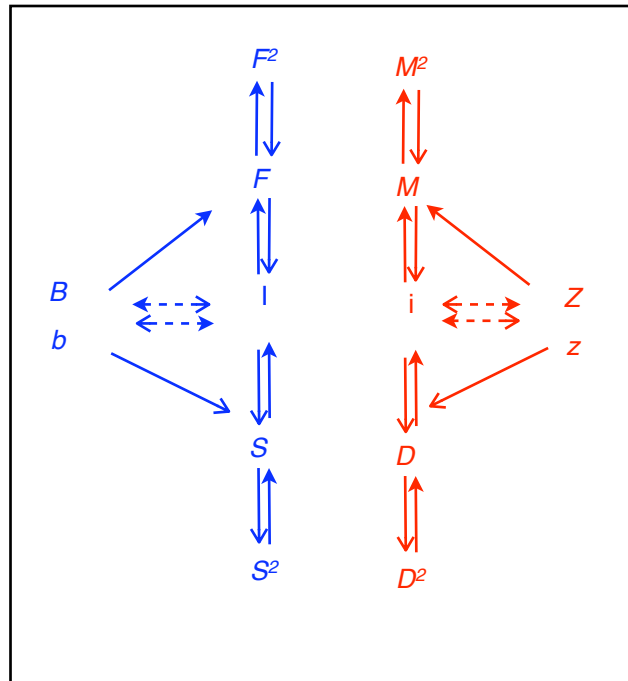
For diagrammatic simplicity, we will drop the reflexive arrows and put the  $B$  and  $b$  elements on the left side of the diagram (Figure 3B). Now make an isomorphic copy of this structure for the structure of female elements (see Figure 4; see discussion in Read and Behrens 1990; Bennardo and Read 2005, 2007 and Leaf and Read n.d. regarding the sex marking of kin terms). The generating set for the female structure will be, say,  $\{i, M, Z, D, z\}$  and we also include isomorphic copies of all the structural equations we introduced for the male structure (i.e., we include equations such as  $MZ = M$ ,  $ZZ = Z$ , and so on).



**Figure 3:** (A) Combined structure of ascending and descending terms. Core structure for classificatory terminologies. (B) Combined structure with sibling terms on the left side of the structure. Reflexive arrows deleted for clarity.

### 5.6 Join the Male-Marked and Female-Marked Structures

The next step is to link these two structures together. For the Kariera terminology we do it by interpreting  $Z$  and  $z$  as ‘older sister’ and ‘younger sister’ of male self and  $B$  and  $b$  as ‘older brother’ and ‘younger brother’ of female self (see Figure 5A). This leads to both male and female speakers having ‘older/younger brother’ and ‘older/younger sister’ terms. For the Trobriand and the Tongan terminologies we do this by interpreting  $i$  (female self) as ‘sister’ of male self and  $I$  (‘male self’) as ‘brother’ of female self. This leads to the asymmetry that male speaker has ‘older/younger brother’ terms but only a single ‘sister’ term and similarly for female speaker with the sex of the terms reversed (see Figure 5B). In both cases, we end up with ‘cross-cousin’ being just the kin term products  $SBM$ ,  $SZF$ ,  $DBM$  or  $DZF$  without an older/younger distinction. Thus these two procedures for joining the male-marked terms and the female-marked terms will not account for the ‘older’/‘younger’ distinction among the ‘cross-cousin’ kin terms in the Tamil (and other Dravidian) terminologies and so we need a different procedure for joining these two structures together into a single structure of kin terms.



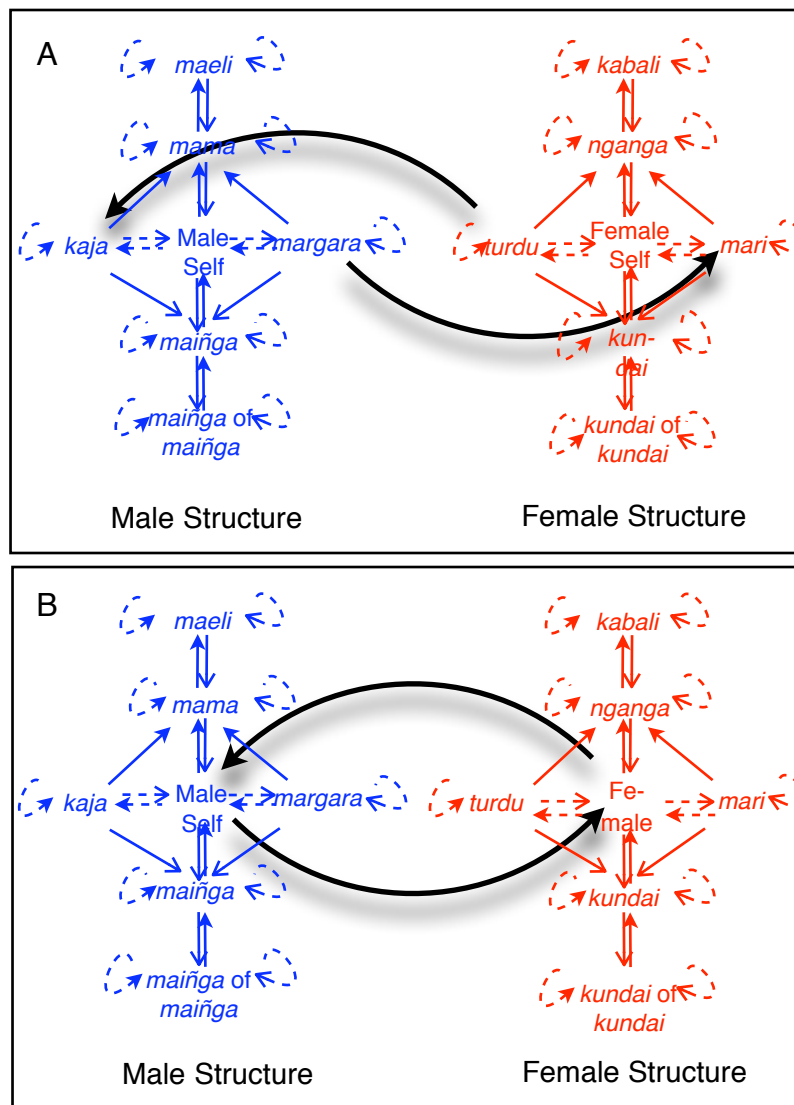
**Figure 4:** Core structure of male marked terms (left side of figure) and core structure of female marked terms (right side of figure).

The way we will join the structures is by introducing a cover term for  $I$  and  $i$ , label it  $[I, i]$ , hence an element without sex marking. That is, introduce self as a cover term for male self (the interpreted form of  $I$ ) and female self (the interpreted form of  $i$ ), so that we now have a single, neutral self term in the structure constructed from the structure of male terms and from the structure of female terms (see Figure 6). In this step, we are just linking the two structures together. We will compute products of male terms with female terms and vice-versa at a later step. At this point we have a structure with an opposition between two lineal structures based on sex, the third dimension distinguished by Dumont (1953) for Dravidian terminologies.

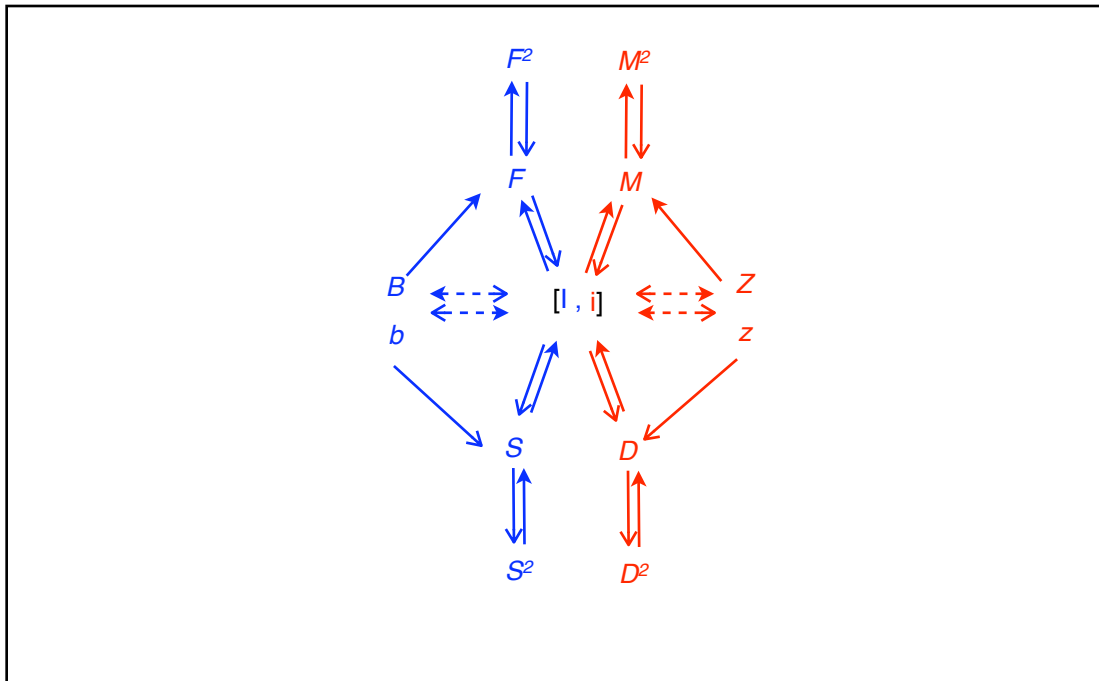
We will now drop temporarily the arrows from  $B$  and  $b$  to  $F$ , from  $Z$  and  $z$  to  $M$ , from  $F$  and  $M$  to  $F^2$  and  $M^2$ , respectively, and from  $S$  and  $D$  to  $S^2$  and  $D^2$ , respectively, as we want to focus on the generating elements and the structural properties relating the generating elements. We will call this the *self structure* (see Figure 7, left side).

### 6. Affinal Structure

Next we introduce affinal terms by making an isomorphic copy of the self structure (left side of Figure 7), but with  $H$  and  $W$  in place of  $I$  and  $I$ , hence  $[H, W]$  in place of  $[I, i]$  (but written in the reverse order,  $[W, H]$  since it will be convenient to have the female marked terms on the left side of the isomorphic copy that we are now constructing). We include the element  $[W, H]$

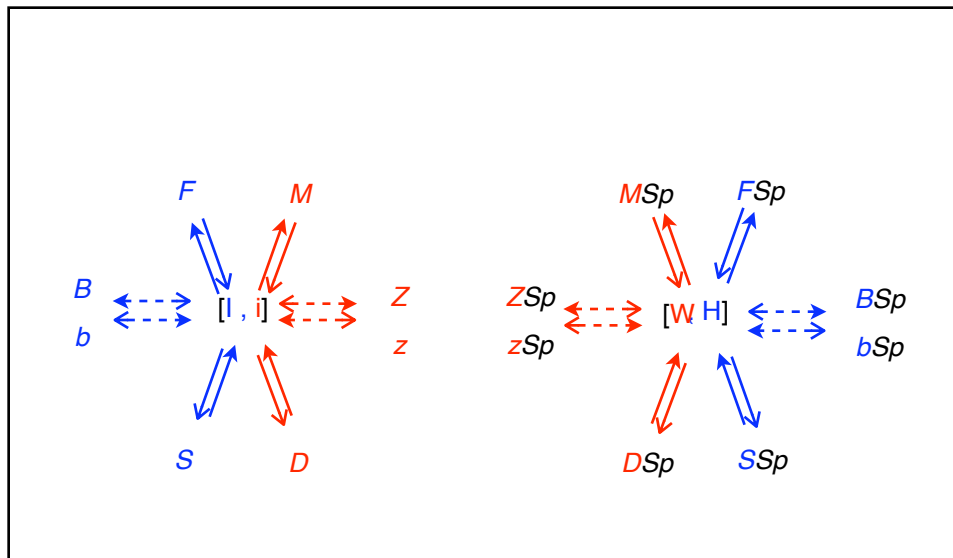


**Figure 5:** Core structures with terms from the Kariera terminology. (A) The disjoint structures are linked through the *kaja/turdu* and the *margara/mari* positions. For speaker located at Male Self or Female Self, the sibling positions become *kaja*, *margara*, *turdu*, and *mari* (glossed as ‘older brother,’ ‘younger brother,’ ‘older sister,’ and ‘younger sister,’ respectively). (B) Other classificatory terminologies such as the Trobriand and the Tongan terminologies link the disjoint structures through the Male Self and Female Self positions labeled as sibling terms and illustrated here using the Kariera kin terms. For speaker located at Male Self, the Female Self position would be labeled ‘sister’ and for ego located at Female Self, the Male Self position would be labeled ‘brother.’ The sibling positions for a male ego would thus be *kaja* and *margara* (glossed as ‘older brother’ and ‘younger brother’) and ‘sister.’ The sibling positions for a female ego would be *turdu* and *mari* (glossed as ‘older sister’ and ‘younger sister’) and ‘brother.’ Thus in the Trobriand and Tongan terminologies -- but not the Kariera terminology -- ego has same-sex ‘older and younger sibling’ terms and an opposite-sex sibling term without an ‘older’/‘younger’ distinction (from Leaf and Read n.d., Figure 8-10).



**Figure 6:** Linkage between the structure of male terms and the structure of female terms.

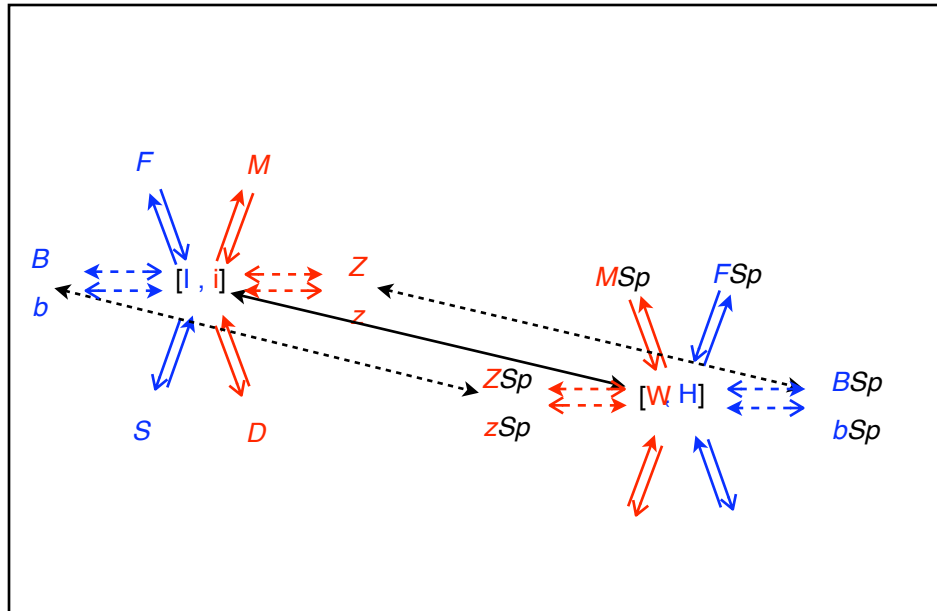
as part of the product for all other nodes, but for simplicity of notation we will use Sp to denote [W, H] in all nodes except the central node. We will call this the *spouse structure* (see Figure 7,



**Figure 7:** Structure of generating terms centered on self (left side of figure). Isomorphic structure centered on spouse (right side of figure).

right side).

By making an isomorphic copy, we are just making explicit the fact that with marriage we have two structures linked together, namely a structure centered on self and a structure centered on spouse. In terminologies such as the AKT, structural equations “remove” most of the spouse structure; e.g., equations such as parent of parent of spouse is not a kin term. Here we will keep the complete spouse structure. This means that we need a way to link the self structure and the spouse structure.



**Figure 8:** Linkage between the self structure and the spouse structure via spouse product. The solid, double-headed arrow indicates that spouse of  $[I, i] = [W, H]$ ; that is, spouse of male self is wife and spouse of female self is husband. The dashed, double-headed arrows indicate that wife of  $B^* = Z^*Sp$  and husband of  $Z^* = B^*Sp$ ; that is, wife of ‘older brother/younger brother’ of self is ‘older sister/younger sister’ of spouse of self and similarly for the other equation.

### 6.1 Linkage of the Self Structure with the Spouse Structure

We will do this in two steps. We will use two kinds of links: spouse links and sibling links. First we link the 0 generation elements by spouse links between the 0 generation elements in the self structure and the 0 generation elements in the spouse structure. For the self element  $[I, i]$ , this just means that spouse of self is spouse, so we link  $[I, i]$  with  $[H, W]$  (solid, double-headed arrow in Figure 8) in the obvious manner:  $WI = W$  and  $Hi = H$ . The elements  $B$  and  $b$  will be linked to  $ZSp$  and  $zSp$  respectively (dashed, double-headed arrow in Figure 8), and similarly  $Z$  and  $z$  will be linked to  $BSp$  and  $bSp$ , respectively (dashed, double-headed arrow in Figure 8). At this point we have a structure with an opposition between the self structure and the spouse structure (or what Dumont [1953] refers to as an opposition between kin and affine) based on marriage, the fourth dimension distinguished by Dumont (1953) for Dravidian terminologies.

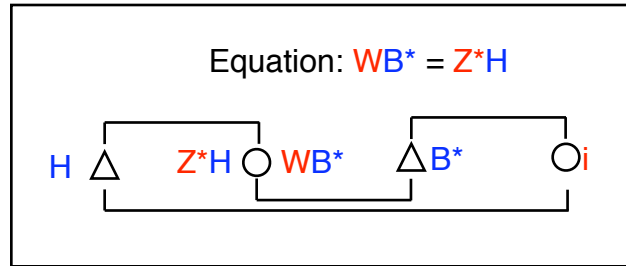


We can express the sibling elements linked via spouse products with the following equations:

(1)  $WB^* = Z^*H$  (read: “‘wife’ of ‘brother [elder or younger]’ is ‘sister [elder or younger]’ of ‘husband’”)

and

(2)  $HZ^* = B^* W$  (read: “‘husband’ of ‘sister [elder or younger]’ is ‘brother [elder or younger]’ of ‘wife’”).



**Figure 9:** ‘Brother’-‘sister’ exchange structure.

These equations imply ‘brother’-‘sister’ exchange (see Figure 9; shown only for Eq. 1). The triangle and circle symbols identify positions that may be occupied by a male person or a female person, respectively. The horizontal line symbol above and connecting a triangle and a circle indicates that for a male person at the triangle position it follows that a female at the circle position is someone for whom he may properly use a sibling term, and vice versa, not that the male and female persons in question are genealogical brother and genealogical sister. The horizontal line symbol below and connecting a triangle and a circle indicates that a male person at the triangle position may properly use a ‘wife’ term for a female person at the circle position, and vice versa, the female person at the circle position may properly use a ‘husband’ term for a male person at the triangle position.

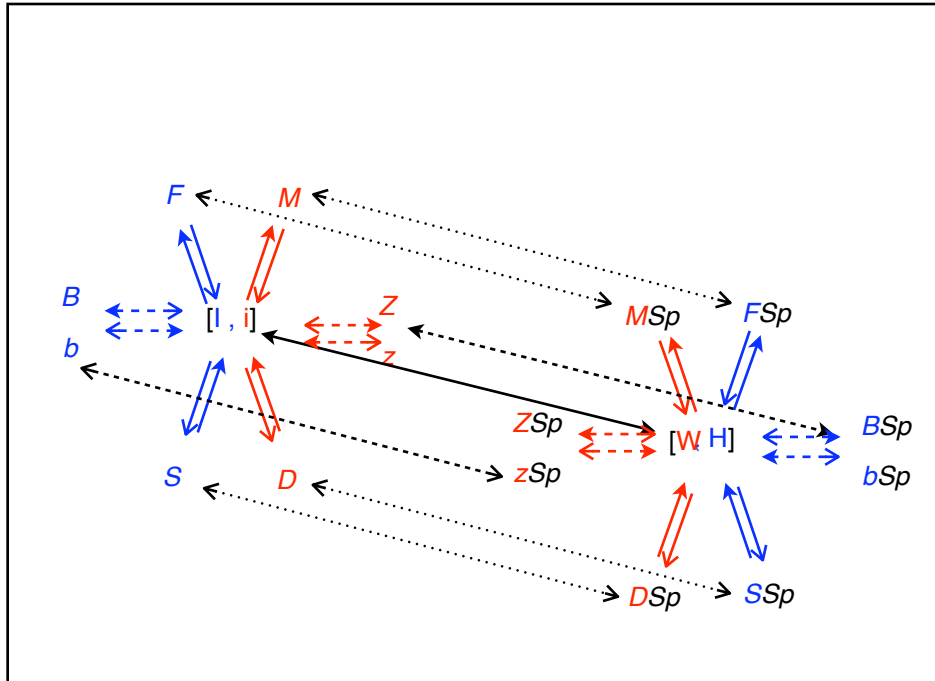
Next we link the +1 and -1 generation elements. In the -1 generation, the element **S** is linked to **D**Sp by a sibling link (dotted, double-headed arrow in Figure 10) and the element to **D** is linked to **S**Sp by a sibling link (dotted, double-headed arrow). These two linkages just assert that ‘son’/‘daughter’ of self is ‘son’/‘daughter’ of ‘spouse’ of self. Reciprocally, in the +1 generation the element **F** is linked to **M**Sp by a sibling link (dotted, double-headed arrow) and the element to **M** is linked to **F**Sp by a sibling link (dotted, double-headed arrow).

### **6.2 Emergent ‘cross-cousin’ Marriage Structure**

We can express these links with the following equations for the +1 generation (the equations for the -1 generation are straightforward):

(3)  $Z^*F = MSp$  ( $Z^*F = MHi = MWI$ ) (read “‘sister’ of ‘father’ is ‘mother’ of ‘husband’ of female self or ‘mother’ of ‘wife’ of male self”)

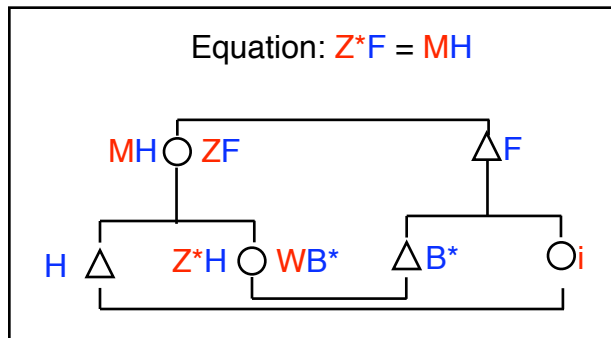
and



**Figure 10:** Sibling links between the self structure and the spouse structure for +1 and -1 generation elements indicated by double headed dotted arrows.

(4)  $B^*M = FSp$  ( $B^*M = FWI = FH_i$ ) (read “‘brother’ of ‘mother’ is ‘father’ of ‘wife’ of male self or ‘father’ of ‘husband’ of female self”).

When these equations are added to the ‘brother’-‘sister’ exchange structure, we obtain the structure for ‘cross-cousin’ marriage (see Figure 11).



**Figure 11:** ‘Cross-cousin’ marriage structure.

So in the structural logic of the Dravidian language terminologies, ‘cross-cousin’ marriage emerges from the spouse links and the sibling links used for joining the self and the spouse structures. This differs structurally and conceptually from the Kariera terminology where the ‘cross-cousin’ marriage rule is logically necessary for the form of the Kariera terminology structure (Leaf and Read n.d.) and is not emergent. Here, however, the “marriage rule” is emergent. The

difference leads to the conceptual distinction between a prescriptive rule (the Kariera case) and an emergent marriage constraint (the NV Tamil case).

### 6.3 Complete Generated Structure

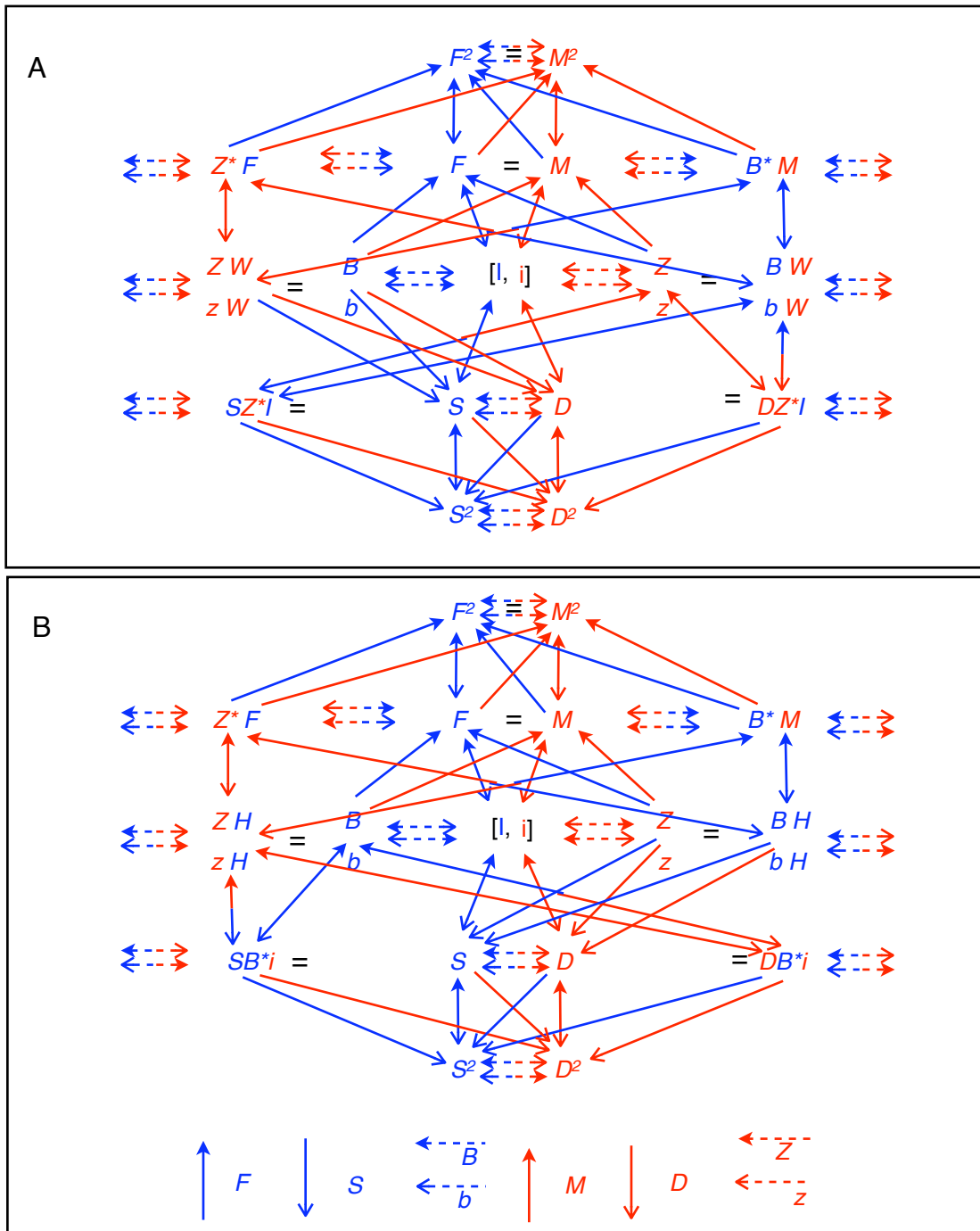
Next we put the pieces together (including the products between male elements and female elements). In so doing, the lineal structure (for kin terms, not for genealogical relations) is preserved by adding the equations  $MF = MM$ ,  $FM = FF$ ,  $B*MM = FF$ , and  $Z*FF = MM$  and their reciprocal equations, which gives us just two ‘grandparent’ terms in +2 generation and two ‘grandchild’ terms in -2 generation (see Figure 12, where the lineal structure for kin terms can be seen easily). We now have a terminology with older/younger ‘cross-cousin’ terms introduced by making an isomorphic copy of the self structure for the spouse structure. Note that the equations  $MF = MM$ ,  $FM = FF$  are not logically necessary, hence without these two equations we would have a Dravidian terminology with four terms in the +2 generation. Thus Dravidian language terminologies with either two or four terms in the +2 generation are possible with the logic of generating a Dravidian language terminology.

Lastly, we replace the algebra symbols by their isomorphically equivalent kin terms and arrive at the NV Tamil structure (minus the older/younger distinction for the +1 generation as discussed above; compare Figures 1 and 12). Note that the elements  $SZ*I$  (read “‘son’ of ‘o/y sister’ of male self”) and  $SB*i$  (read “‘son’ of ‘o/y brother’ of female self”) though distinct elements in the algebra, are equated by using the same kin term for both elements. The use of the same kin term reflects the fact that the elements  $SZ*I$  and  $SB*i$  are in the same structural position for each of male self and female self (see Figure 12A and B). A similar comment applies to  $DZ*I$  and  $DB*i$ . We have now worked out the generative logic for Dravidian language terminologies.

### 6.4 Predictions from the Generative Logic for the NV Tamil Terminology

The generative logic is also predictive. We have not only generated the positions in Figure 12 marked by *attan* and *maccinan* for the male-marked ‘cross-cousin’ terms in Figure 1 (and similarly for the female-marked ‘cross-cousin’ terms), but kin term products that map to this position, hence imply other kin type products that would be included under the ‘cross-cousin’ terms. More specifically, the pair of algebra products  $BW$  and  $bW$  (read “‘older brother’ of ‘wife’ and ‘younger brother’ of ‘wife’”) determine the ‘male cross-cousin’ positions in Figure 12 that correspond to the terms *attan* and *maccinan* in Figure 1, so the kin types to which these algebra products map (namely wife’s ‘younger/older brother’) are predicted as being included under the kin terms *attan* and *maccinan*. (The general procedure for mapping kin terms predictively to the genealogical space via the algebra products is discussed below.) This is precisely the case. Similar results and verified predictions apply to the female marked ‘cross-cousin’ terms.

The generative logic also implies that the ‘cross-cousin’ kin terms are not terms for spouse of self since  $Sp[L,i]$  (read “spouse of male self or spouse of female self) does not reduce to any of



**Figure 12:** Structures generated by the generative logic for a Dravidian terminology. (A) Structure from the perspective of *I* (male self). (B) Structure from the perspective of *i* (female self). Arrows on the extreme right and left of (A) and (B) wrap around to the other side. Reflexive arrows are not shown. Solid arrow heads are ascending generating elements and open arrow heads are descending generating elements. The elements  $Z^*Sp$  and  $B^*Sp$  become  $Z^*W$  and  $B^*W$  in (A) and  $Z^*H$  and  $B^*H$  in (B) since (A) is from the perspective of male self and (B) is from the perspective of female self.

the terms in the equality,  $SB^*M = SZ^*F = B^*W = SpZ^*$  (read “‘son’ of ‘o/y brother’ of ‘mother’ is the same as ‘son’ of ‘o/y sister’ of ‘father’ is the same as ‘o/y brother’ of ‘wife’ is the same as ‘spouse’ of ‘o/y sister’”) that expresses the different algebra products generating the position in Figure 12 corresponding to the male ‘cross-cousin’ term in Figure 1. This contrasts with the Karia terminology for which ‘spouse’ of ‘self’ is ‘cross-cousin’. The generative logic thus accounts for the Tamil terminologies having separate kin terms for ‘wife’ and ‘husband,’ e.g., the the NV Tamil terminology has the terms *mappillai* (‘husband’) and *pencati* (‘wife’).

### 7. Mapping Kin Terms to Categories of Kin Types

Defining the mapping of kin terms to sets (or categories) of kin types is straight forward. First we map the generating elements to sets of kin types (symbolized by f [genealogical father], m [genealogical mother], s [genealogical son], and d [genealogical daughter]) as follows:  $I \rightarrow \{\text{male ego}\}$ ,  $i \rightarrow \{\text{female ego}\}$ ,  $F \rightarrow \{f\}$ ,  $M \rightarrow \{m\}$ ,  $S \rightarrow \{s\}$ ,  $D \rightarrow \{d\}$ ,  $B \rightarrow \{fs+, ms+\}$ ,  $b \rightarrow \{fs-, ms-\}$ ,  $Z \rightarrow \{fd+, md+\}$ , and  $z \rightarrow \{fd-, md-\}$ , where  $s+$ ,  $d+$  are genealogical father’s (genealogical mother’s) genealogical son (genealogical daughter) older than ego and  $s-$ ,  $d-$  are genealogical father’s (genealogical mother’s) genealogical son (genealogical daughter) younger than ego. Then for any kin term we express it as a product of its generating elements and replace each element in the product by its corresponding product of sets of kin types, where products of sets of kin types are written left to right to allow for a kin type product such as  $ms+$  to be read “genealogical mother’s older genealogical son.” Thus we map the kin term product  $FM$  (‘father’ of ‘mother’) to the product  $\{m\}\{f\}$  of sets of kin types. Finally, we multiply the sets in an element by element manner so  $\{m\}\{f\} = \{mf\}$  and we map  $FM$  to the set  $\{mf\}$  of kin types.

Now let us illustrate this mapping procedure with the kin term *maman* =  $(BM \text{ or } bM)$ . We map:  $maman \rightarrow \{m\}\{fs+, ms+\} \cup \{m\}\{fs-, ms-\} = \{mfs+, mms+, mfs-, mms-\} = \{mb+, mb-\} = \{mb\}$ , where “ $\cup$ ” stands for set union,  $fs+ = ms+ = b+$  and  $fs- = ms- = b-$  are ego’s older genealogical brother and younger genealogical brother, respectively, and  $b (= fs = ms)$  is genealogical brother.

Now consider a kin term such as *appa* corresponding to  $F$  that is also the reduction, in the algebra, of other kin term products such as  $B^*F$ . First, *appa* is mapped to  $\{f\}$  since  $F \rightarrow \{f\}$ . Next, *appa* is also mapped to any kin type product arising from a kin term product that reduces to  $F$  in the algebra. Since  $B^*F = F$ , it follows that *appa* is also mapped to the set  $\{fb\}$  of kin type products since  $B^*F \rightarrow \{f\}\{fs+, ms+\} \cup \{f\}\{fs-, ms-\} = \{ffs+, fms+, ffs-, fms-\} = \{fb+, fb-\} = \{fb\}$ , where  $fb$  is read “father’s brother.” Similar arguments would apply to other products that reduce to *appa*. This example also shows how the “extensionist hypothesis” that is the basis of rewrite rules is subsumed under the mapping of the algebraic structure to sets of kin types.<sup>3</sup>

We can also map kin type products to kin terms. We replace each kin type in the kin type product by the kin term mapped to that kin type, rewrite the order of the products from right to left (since kin term products are computed right to left) and then reduce the product of kin terms in the algebra (or equivalently, we read off the reduced kin term product from the kin term map).

<sup>3</sup> Warren Shapiro (2009, personal communication) brought this possibility to my attention in email correspondence.

For example,  $fmb \rightarrow (BMF \text{ or } bMF) = B*MF = FF$  since  $MF = MM$  and  $B*MM = FF$  in the algebra. Thus the kin type product,  $fmb$ , is included under the kin term *pattan*.

### 8. Terminological Expression of the Cross/Parallel Opposition<sup>4</sup>

In his seminal article on the Dravidian terminology, Dumont (1953) argued that the Tamil terminologies should not be viewed from a genealogical viewpoint, especially with regard to marriages and the notion of kin classes in opposition. He noted that trying to express the opposition genealogically through change of sex when tracing from ego to alter is an “unsatisfactory concept” introduced by the anthropologist and it is “not in the least expressed in their theory” (1953: 35). Instead, their theory is expressed through division of the terminology for the middle three generations into an opposition between terms whose reference are those persons who cannot marry among themselves and those from whom wives (or husbands) must be taken. This opposition expresses the generative logic of the terminology whereby the affinal terms are introduced through an opposition between a structure of consanguineal terms and a structure of affinal terms (see Figure 8 and and following text).

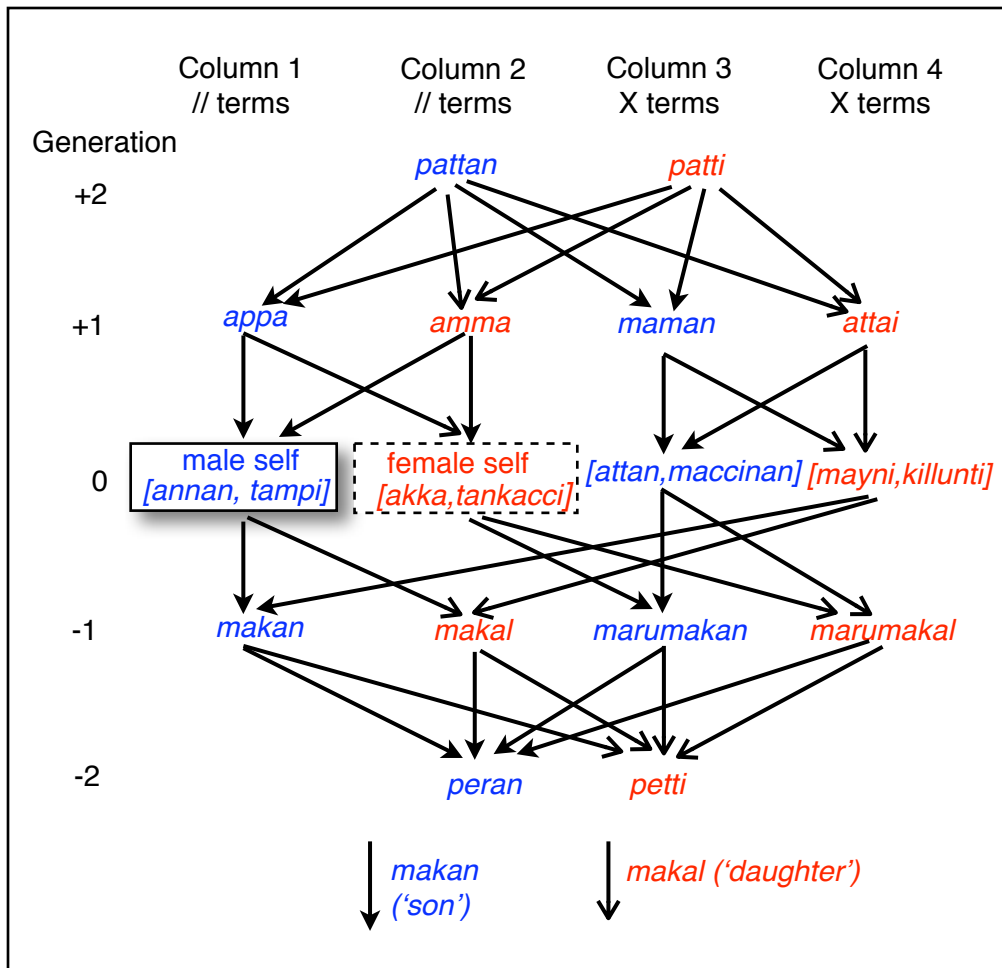
We can redraw the kin term map for NV Tamil terminology, as shown in Figure 13, so as to make this opposition evident from the perspective of the kinship terminology structure. In Columns 1 and 2 for the middle three generations are the terms such that if someone refers to another person by one of these kin terms then the latter person is non-marriageable. In Columns 3 and 4 (for the middle three generations) are the terms such that if someone refers to another person by one of these kin terms then they are potentially marriageable. In keeping with the well-established notation in the literature on Dravidian terminologies of designating reference persons as // or X with respect to ego, we can call the first set of terms the // -terms and the second set of terms the X -terms. Note that the // -terms are those for which marriage would be considered incestuous as indicated by the English transliterations: ‘father’, ‘mother’, ‘brother’, ‘sister’, ‘son’ and ‘daughter’; that is, the underlying concept represented by the // and X notation is that of kin relations where marriage is not permissible and kin relations where marriage is permissible.

The set of // -terms and the set X -terms each have a male-lineage structure from the view point of kin terms (see three middle male kin terms in Column 1 and in Column 3), thus we can view the // and X distinction as an opposition between two lines of male kin terms. This captures precisely Dumont’s insistence that in the +1 generation the opposition is between *appa* and *man*, an opposition that is not based on change of sex:

In fact, it is the anthropologist alone who is responsible for the introduction of this unsatisfactory concept of a 'change of sex'; he does so because he wants to trace through a relative of the opposite sex a relationship which the native conceives -- when he

---

<sup>4</sup> This and the next section are based on an extensive series of email exchanges in May 2010 between Dwight Read and Douglas White. The email exchanges were aimed at bringing closure between White’s network structural analysis of reported data on Dravidian marriages and Read’s analysis of the generative logic for a Dravidian kinship terminology.



**Figure 13:** Kin term map showing the // and X opposition between the kin terms in the middle three generations.

thinks classificatorily -- in a different manner. For instance we introduce the mother as a link between Ego and his mother's brother, where in fact the latter is just opposed to the father (1953: 35, emphasis added).

Dumont recognized that trying to view the // and X opposition through genealogy was a distortion, but did not carry his argument through to its logical conclusion, namely that the opposition has to be expressed through the logic of the kinship terminology (see Figure 8 and following text). Rather than characterizing the opposition genealogically through change of sex, which is not a Tamil concept, we have expressed it here through the kinship terminology structured in accordance with their concepts about kin relations expressed through their kin terms. We can now relate the // and X opposition (keeping the terms // and X only because of their historical precedence) to different marriage types consistent with the // and X opposition. We refer to marriage types since the kin term structure does not express what marriages must occur, but only what marriages are consistent with the logic of the terminology structure.

In generation +1, the opposition is between the kin terms *appa* ('father') + *amma* ('mother') and *maman* ('o/y brother' of 'mother') + *attai* ('o/y sister' of 'father'). The opposition is consistent with marriage of a male to a female referred to as *attai* but this kind of marriage is unlikely to occur due to the combination of age differences and a preference for a man to marry a younger woman.

For generation 0, the opposition is between [*annan, tampi*] ('brother') + [*akka, tankacci*] ('sister') and [*attan, maccinan*] ('male cross-cousin') + [*mayni, killunti*] ('female cross-cousin'). For a generation 0 marriage, one cannot marry a 'sibling,' hence by default one must marry a 'cross-cousin.'

In generation -1, the opposition is between *makan* ('son') + *makal* ('daughter') and *marumakan* ('nephew') + *marumakal* ('niece'). The opposition is consistent with marriage of a male to a female referred to as *marumakal* ('niece') and such marriages take place, but normally with a female referred to as *makal* of *tankacci* ('daughter' of 'older sister') (Good 1980). Note that while the // and X kin terms for -1 generation are the same for both a male and a female speaker, the persons so designated reverse for a male speaker and a female speaker who are 'sibling' to each other; that is, the persons referred to by male speaker as 'son' or 'daughter' are referred to by his 'sister' by the terms 'nephew' and 'niece,' and vice-versa. The importance of this reversal will be seen below when we consider the way marriages interrelate with an implicit patrimoiety-like structure and an implicit matrimoiety-like structure.

Though the opposition between the // -terms = {*appa, annan, tampi, makan, amma, akka, tankacci, makal*} and the X -terms = {*maman, attan, maccinan, marumakan, attai, mayni, killunti, marumakal*} is the same for male speaker and female speaker, the division of persons entailed by these two sets of terms are "ego-centric" and not "socio-centric." For example, a male speaker's genealogical father and genealogical mother are both parallel to him, hence both are in his // group, but for genealogical father his // group includes his genealogical son but not his wife (male speaker's genealogical mother) and so male speaker's // group and his genealogical father's // group are not the same. Thus, as pointed out by Good (1980), it is inappropriate to think of marriages as exchanges between overtly recognized groups since there are no such socio-centric groups between which marriages are exchanged. Nor is the opposition between sets of kin terms the basis for an exchange model. As Good put it rhetorically, "how can kinship terms (for they are what we are ultimately considering) be said to 'exchange' with each other, directionally or otherwise?" (1980: 490). Good is referring to the fact that the exchange relationship between Columns 1 + 2 and Columns 3 + 4 for the middle three generations in Figure 13 refers only to the structural relations among the kin terms and not to an exchange relationship between overtly identified, socio-centric groups.

From the perspective of the kinship terminology, the matter of calculating whether persons are marriageable or not is straightforward. If A and B know their kin term relationship as part of the middle three generations, then automatically they know if they are marriageable or not. If they do not know their kin term relationship, then they may compute it using calculations with kin term products by tracing back to an ancestor C for A and an ancestor D for B (e.g., tracing back agnatically [Lehman, personal communication 2010a]), respectively, for whom the // -term /



X-term opposition is known. Then the // -term / X-term relation may be computed as one comes forward from C and D to A and B. For example, if K is the 0 generation kin term relation of D to C and both C\* and D\* are *makan* ('son') with respect to C and D, respectively, then the 0 generation kin term relation of D\* to C\* is given by the kin term product, *makan* of K of *appa*, and so on. This is the kind of calculation made by the users of Dravidian language terminologies:

Rus Reid's Telegu data are such that they themselves told him explicitly that one does precisely that calculation [shown above] to figure out how they call one another and how their respective middle-generation terminologies line up: i.e., their respective terminologies do NOT change, but it is rather that they figure out what terms they ought to use for each others' middle-generation relatives! (Lehman 2010b, personal communication).

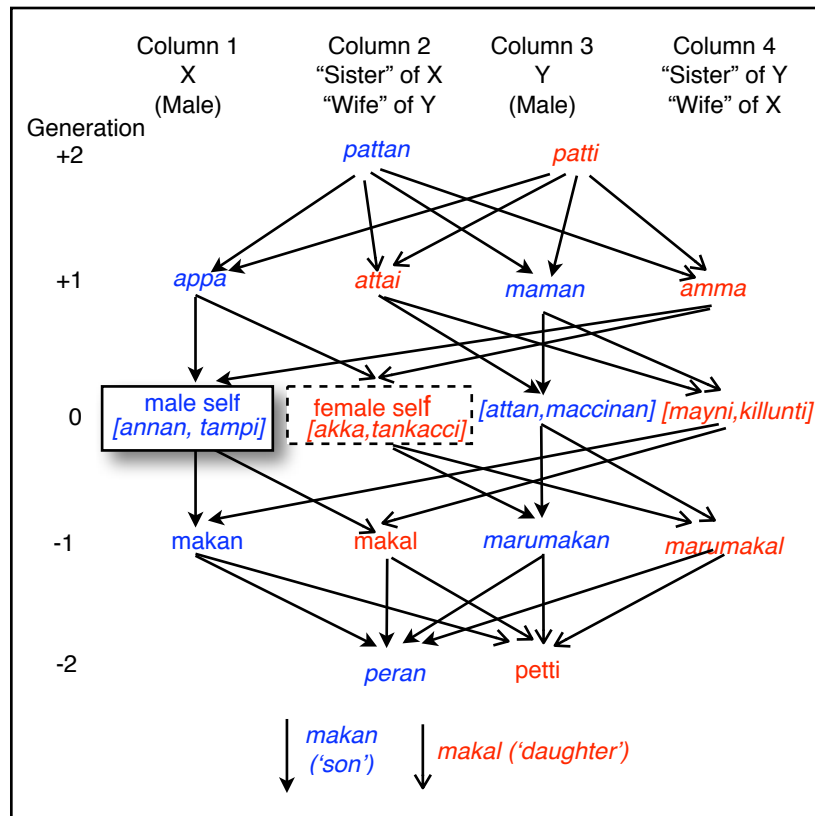
Although the // and X relations can be expressed genealogically and algorithms devised for converting genealogical pathways into // and X relations (e.g., Kay 1967), the latter introduces an unneeded, imposed genealogically-based algorithm. The // -term, X-term opposition can be computed in a straight-forward manner from the perspective of the logic of the kinship terminology by using the kind of computations users of a terminology employ to determine kin relations directly from kin terms without reverting to genealogically based computations.

### 9. Marriage Sidedness

Though the // term X term opposition does not translate into an opposition between a pair of socio-centric groups, nonetheless the NV Tamil terminology has a logic for the middle three generations comparable to that of the Kariera terminology. For the Kariera terminology there are homomorphic mappings of the kinship terminology onto both an implicit patrimoiety-like structure and an implicit matrimoiety-like structure. In either case, the terminology structure induces an absolute division of society members into two opposing groups when all Kariera marriages are consistent with the *n̄uba* ('cross-cousin') marriage rule (Leaf and Read n.d.). These two implicit, opposing groups become evident through a network analysis of marriages (Houseman and White 1998). Houseman and White (1998) refer to this opposition of two implicit groups as *sidedness* and distinguish between the two possibilities as *viri-sidedness* and *uxori-sidedness*.

However, an analogous mapping of kin terms onto implicit moiety-like structures does not hold for the NV Tamil terminology due to the kin terms in the +2 and -2 generations. Nonetheless, the kin terms in the middle three generations have a structure consistent with both patrimoiety-like and matrimoiety-like structures, as can be seen in Figures 14 and 15.

When all marriages are 0 generation marriages, all three of these ways of looking at the Tamil terminologies (// versus X, implicit patrimoiety, and implicit matrimoiety) coincide in the sense that a male self/[*mayni*, *killunti*] marriage will also be a marriage consistent both with the patrimoiety-like structure shown in the middle three generations in Figure 14, the matrimoiety-like structure shown in the middle three generations in Figure 15 and the // term, X term opposition. Hence if all marriages are 0 generation marriages consistent with the logic of the kin term



**Figure 14:** Implicit patri moiety structure for middle three generations (male self perspective). Columns 1 and 2 make up one side of the moiety structure and Columns 3 and 4 make up the other side of the moiety structure.

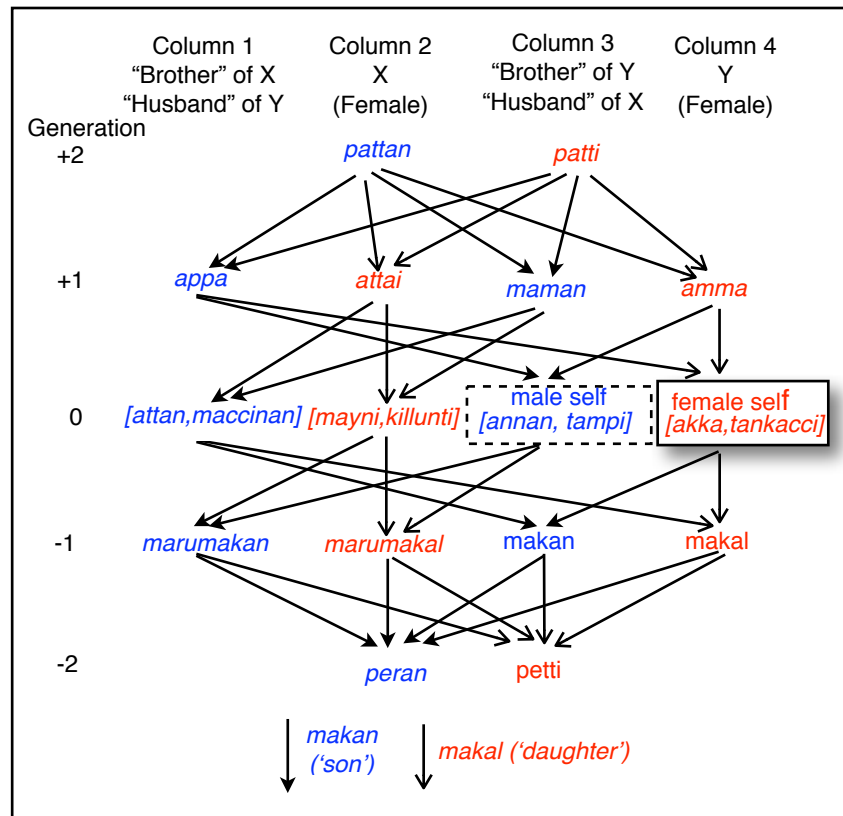
structure, the network analysis will show “a marriage network ... [that] is at once viri-sided and uxori-sided” (Houseman and White 1998: 234).

However, with male self/*marumakal* marriages, asymmetry is introduced due to the reversal of the persons who are // or X when comparing a male speaker to his ‘sister’ in the -1 generation, as noted above. A male self/*marumakal* marriage is consistent with the patri moiety-like structure but not with the matrimoiety-like structure. As a result, for a marriage network with male self/*marumakal* marriages, the marriage network will be “organized in the male line (viri-sidedness)” (Houseman and White 1998: 216).

If there were male self/*attai* marriages, the pattern would reverse since such a marriage would be consistent with the matrimoiety-like structure but not with the patri moiety-like structure and so the marriages would be structurally aligned in accordance with the female line (uxori-sidedness).

### 10. Conclusion

We now have the logic for the generation of the Dravidian language kinship terminologies. The logic makes it evident that the older/younger distinction for the ‘cross-cousin’ terms is not



**Figure 15:** Implicit matrimoiety structure for middle three generations (female self perspective). Columns 1 and 2 make up one side of the moiety structure and Columns 3 and 4 make up the other side of the moiety structure.

simply an attribute added to these kin terms, but reflects a “deep-structure” difference among classificatory terminologies having to do with the way a structure of male terms is conceptually joined with a structure of female terms (compare Figures 5A, 5B, and 6). This “deep-structure” difference shows up in the fact that the Dravidian language terminologies and terminologies like the Kariera terminology both have a ‘cross-cousin’ marriage rule, but for very different reasons and with different implications. The Kariera marriage rule expresses what is part of the generative logic of the terminology, whereas the Tamil terminologies express emergent constraints on marriages for a marriage to be consistent with the logic of the terminology and with incest rules. In the Tamil terminologies, the “marriage logic” is the opposition developed in Figures 6-8 and 10 from which the “marriage rule” emerges in the form of the marriage types consistent with the structural logic of the terminology (Figures 9 and 12). Thus a 0 generation marriage is constrained to be with ‘cross-cousin,’ but +1, -1 generation marriages consistent with the logic of the terminology structure are also possible and, for the -1 generation, occur often (Wood 1980; Houseman and White 1998). Rather than speaking of a ‘cross-cousin’ marriage rule, it would be

more accurate to say, as Dumont noted in his comment about “‘terminological kin’ ... opposed to ‘terminological affines’” (1953:37), that the terminological system is structured around the marriage opposition introduced through the generative logic of the kinship terminology and it is the logic of this marriage opposition that leads to the ‘cross-cousin’ marriage rule for 0 generation marriages and not the reverse.

This difference in the structural basis for a ‘cross-cousin’ marriage rule has different implications for the structure of the NV Tamil versus the Kariera kinship terminologies. For example, to maintain a lineal structure within the terminology structure (see central part of Figures 1 and 12), the Dravidian language terminologies need to restrict the +2 and -2 generations to two terms in each of these generations. When the kin terms in these two generations are restricted in this manner, a Dravidian language terminology will not have the implicit logic of a moiety structure embedded within the terminology structure. Nonetheless, sidedness (Houseman and White 1998) will characterize the network structure for marriages when they are contracted consistently with the logic of a Dravidian language terminology for 0 generation marriages; i.e., marriages are with a man referred to as *attan* or *maccinan* for a female and with a woman referred to as *mayni* or *killunti* for a male.

In lieu of sections and marriage rules, Dravidian language terminologies have been characterized through the concepts of “parallel” and “cross” kin and marriages. We now have the generative logic for this characterization, not through derived algorithms based on genealogical relations but through the generative logic of a Dravidian language terminology. The implications of that logic can be expressed through characterization of the middle three generations of kin terms as // or X-terms (see Figure 13), though this does not carry over to a socio-centric division for the society as a whole into a // group and a X group. Nonetheless, there is an emergent pattern of marriage sidedness (see Figure 14 and 15) arising when marriages are consistent with the kin term characterization of // and X kin terms in the 0 and -1 generations. More precisely, marriages like this lead to viri-sidedness as has been shown through the network analysis of actual marriages (Houseman and White 1998). The viri-sidedness is due to the absence of male self/*attai* marriages for demographic reasons alone, if not for other reasons.

Thus, we may conclude that the generative logic of the Dravidian language terminologies provides the formal basis for some of the crucial aspects of social organization in the Dravidian language speaking societies. Further ramifications of the relationships between terminology structure and social organization as it works out in practice need to be explored further, but that is a topic for another paper.

**References Cited:**

- Bennardo, G. and D. Read. 2005. The Tongan kinship terminology: Insights from an algebraic analysis. *Mathematical Anthropology and Cultural Theory*. 2, <http://www.mathematicalanthropology.org/?PG=TOC>
- \_\_\_\_\_. 2007. Cognition, algebra, and culture in the Tongan kinship terminology. *Journal of Cognition and Culture* 7:49-88.
- Good, A. 1980. Elder sister's daughter marriage in south Asia. *Journal of Anthropological Research* 36:474-500.
- Houseman, M. and D. R. White. 1998. "Taking sides: Marriage networks and Dravidian kinship in lowland South America," in *Transformations of kinship*. Edited by M. Godelier, T. Trautmann, and F. Tjon Sie Fat, pp. 214-243. Washington: Smithsonian Institution Press.
- Kay, P. 1967. On the multiplicity of cross/parallel distinctions. *American Anthropologist* 69:83-85.
- Leaf, M. 2009. *Social organization and social theory*. Urbana: University of Illinois Press.
- Leaf, M. and D. Read. n.d. *Ideas, social organization, and ethnology as an empirical formal science*. Book manuscript.
- Lehman, K. 2010a. Personal communication, email dated April 30, 2010.
- \_\_\_\_\_. 2010b. Personal communication, email dated May 28, 2010.
- Lehman, F. K. and K. Witz. 1974. "Prolegomena to a formal theory of kinship," in *Genealogical mathematics*. Edited by P. Ballonoff, pp. 111-134. Paris: Mouton.
- Rao, K. M. 1982 Marriage among the Jalari of coastal Andhra: A study in Dravidian kinship terminology. *Contributions to Indian Sociology* 16:197-223
- Read, D. 2001. "What is kinship?," in *The cultural analysis of kinship: The legacy of David Schneider and its implications for anthropological relativism*. Edited by R. Feinberg and M. Ottenheimer, pp. 78-117. Urbana: University of Illinois Press.
- \_\_\_\_\_. 2007. Kinship theory: A paradigm shift. *Ethnology* 46:329-364.
- \_\_\_\_\_. 2010. The Logic and Structure of Kinship Terminologies: Implications for Theory and Historical Reconstructions. In *Per Hage and the Renaissance in Kinship Studies*. D. Jones and B. Milkic, editors. University of Utah Press.
- Read, D. and C. Behrens. 1990. KAES: An expert system for the algebraic analysis of kinship terminologies. *Journal of Quantitative Anthropology* 2:353-393.
- Shapiro, W. 2009. Personal communication, email dated June 1, 2009.
- Trautmann, T. R. 1981. *Dravidian kinship*. Cambridge: Cambridge University Press.