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The Generative Logic of Crow-Omaha Terminologies:
The Thonga-Ronga Kinship Terminology as a Case Study

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Abstract: *The goal of the paper is to show how the generative logic approach to kinship terminology structures sheds light on the basis for the skewing that characterizes the Crow-Omaha terminologies. The generative logic of the Omaha terminology of the Thonga-Ronga of southern Africa is examined in detail and the skewing in this terminology is found to occur as a consequence of having a set of male generating terms for the male kin terms, but only female self for the female kin terms. This contrasts sharply with the Omaha terminology of the Fox Indians for which the skewing is the result of a deleting the cross-cousin kin terms from an Iroquois terminology. The results obtained here underscore the need to consider the skewing associated with the Crow-Omaha terminologies from the perspective of the generative logic of kinship terminologies.*

Introduction
As a class of kinship terminologies, the Crow-Omaha terminologies have long been, and still are, problematic for both theoretical and empirical reasons (Godelier 2011, Trautmann and Whiteley 2012a). The controversy centers on two aspects of these terminologies. The first aspect is the inclusion of kin terms that skew generational differences in their genealogical referents. Instead of consistently recognizing generational distinctions that are part of genealogical relations, in the Crow terminologies "the cross-cousins on the father's side are called aunt and father, and on the mother's side son and daughter" whereas in the Omaha terminologies "the cross-cousins on the mother's side are called mother and uncle, and those on the father's side nephew and niece" (Trautmann and Whiteley 2012a: 3). This generational skewing in which the same kin term in the terminology of the Omaha Indians refers both to a maternal uncle and to the son of a maternal uncle puzzled Lewis Henry Morgan in the 19th century and still remains controversial. The second aspect relates to marriage rules that, for some societies with Crow or Omaha terminologies, are positive and take the form of prescriptive asymmetric cousin marriage rules, whereas other societies with Crow or Omaha terminologies have negative, proscriptive rules stipulating the lineages from which a spouse may not be obtained. Or, marriage rules may be lacking. The terminology of the Fox Indians does not have the marriage rules often assumed to be associated with Omaha terminologies (Tax 1937).

Though many arguments have been offered regarding the rationale for the generational skewing of kin terms (for a recent discussion see Dziebel 2013), none is completely satisfactory. We still lack a satisfactory account for why a terminology should have kin terms cross-cutting the generational structure of unilineal descent groups for the sex corresponding to the skewed kin terms, whereas terms of the other sex are structurally consistent with the structure of unilineal descent groups. This difference for the sex of the kin terms exhibiting skewing and the way it

relates to unilineality is reflected in the fact that Crow terminologies tend to be associated with matrilineal social systems and Omaha terminologies, with patrilineal social systems. The association has led to the suggestion, with respect to the internal dynamics of a society, that the Crow-Omaha terminologies have their *raison d'être* through the function of reinforcing lineage unity, especially in societies for which a lineal system of social organization is well-established (White 1939:569-570, Murdock 1949:241; see also McKinley 1971b). Alternatively, these terminologies have been viewed as part of the "passage from elementary structures with positive (prescriptive) marriage rules and complex structures with negative (prohibited) marriage rules" (De Heusch 1974:618). According to Claude Lévi-Strauss (1963), the Crow-Omaha groups with proscriptive marriage rules give rise to a kinship system located structurally between elementary kinship systems with prescriptive marriage rules and complex systems that only specify certain marriages as prohibited. From this perspective, societies with Crow-Omaha terminologies and prescriptive asymmetric marriage rules are of a completely different kind than those with proscriptive marriage rules (Trautmann and Whiteley 2012a). These polarities in how the Crow-Omaha terminologies have been characterized remain unresolved and the heterogeneity in the forms of social organization for societies with Crow and Omaha kinship systems are still controversial (Barnes 2012).

Formal attempts to account for the skewing in the Crow-Omaha terminologies have only been partially successful. Although the ground-breaking, equivalence rule formalism introduced by Floyd Lounsbury (1964, 1965) for the analysis of kinship terminologies has played a seminal role in furthering our understanding of the skewing in Crow and Omaha terminologies, there are, nonetheless, crucial limitations to the formalism stemming from the fact that, as Scheffler and Lounsbury (1971) express it, their formalism leads to "*descriptively* satisfactory results" (p. 69, emphasis added); that is to say, it is not explanatory in form (Read 2000, 2008). This does not deny the importance of a good descriptive account; one only has to consider the importance of Kepler's description of planetary motion as being elliptical for Isaac Newton's formulation of a gravitational theory of planetary motion, even though Kepler's descriptions are not explanatory (Read 2008). What the formalism clearly shows, and this alone suffices to document the analytical importance of the formalism, is that often "only a few such rules are necessary" (Scheffler and Lounsbury 1971:73), implying that the equivalence rules are expressing, at least in part, the logic by which kinship terminologies are a coherent and logically consistent systems of kin terms. What the equivalence rules do not succeed in doing, though, is to express that logic in a culturally salient manner; that is, the rules are not deeply rooted in culturally grounded concepts. Instead, the formalism is built around equivalence rules that do not have a demonstrated cultural foundation (Buchler and Selby 1968:44–45; Coult 1967; D'Andrade 1970), as Lounsbury (1965) recognized through his comment that the possible sociological justification for the equivalence rules he had adduced for the Trobriand terminology were only "a suggestion as to the kinds of data in which we *might* expect to find some answers" (1965: 180, emphasis added). However, the expected answers have not been found. Instead, detailed ethnographic evidence has shown that the equivalence rules are not culturally grounded for the users of, for example, the Fanti (Ghana) terminology (Kronenfeld 2009). As recognized by Scheffler and Lounsbury (1971), absent culturally grounded premises, "the use of equivalence rules would be reduced to nothing more than a methodological gimmick which we would not expect any competent scholar to take seriously"

(1971:71) and, as Edmund Leach (1971) noted, without cultural saliency the formalism leads away from the ethnographic context.

In addition, there are also difficulties within the formal accounts. For the Fox Indians, whose Omaha type of kinship terminology was used by Lounsbury (1964) to demonstrate how genealogical reductions can be expressed through equivalence rules, Lounsbury simply asserted, for the genealogical referents of the sibling terms, that "all 'siblings' … [reduce] to B or S" (p. 362).[i] This reduction rule becomes circular if used to account for the genealogical categories corresponding to the sibling kin terms, yet the criterion of being able to account "for what is at hand" is what Lounsbury (1964) required of a satisfactory formal account.

Although the formalism of equivalence rules leads to descriptive, not explanatory, accounts, this does not negate the rationale for developing a formal account of a kinship terminology — a rationale that can be traced back to Kroeber's (1909) argument for relating the features and properties of kin terms to an internal logic rather than to external factors, much like the situation with language and its grammar, and not just to sociological factors (Sapir 1916) or other external criteria. A focus on internal factors contrasts with the more common practice of assuming, often without adequate demonstration, that terminologies, or features of terminologies, are simply the consequence of factors external to the terminology (McKinley 1971a). What we need to determine, then, are the properties of terminologies that derive from internal factors and what factors derive from external considerations. When applied to the skewing of the Crow-Omaha terminologies, Kroeber's argument regarding internal factors implies we need to determine whether the skewing properties arise from an internal logic organizing and structuring these kinship terminologies. To determine this, we first need to determine for a Crow or an Omaha terminology whether it has a culturally salient logic leading to its kin terms being distributed in a skewed manner with respect to their genealogical referents. If such a culturally salient logic is identified, the next step is to determine whether the same logic applies equally to all Crow and Omaha terminologies, and if not, what, formally, are the differences in the logic among the Crow and Omaha terminologies for their skewing of kin terms. Once we have worked out the different logical basis(es) for their skewing of kin terms, we can develop a more refined typology (see Read 2013a) for terminologies with skewing that will put us in a better position for developing ethnographically grounded arguments that account for their occurrence.

The formalism to be presented here, which makes up the bulk of this paper, begins by working out, in detail, the internal, culturally salient generative logic for the skewing of an Omaha terminology in the same manner that a culturally salient generative logic has been worked out successfully for other types of kinship terminologies (see Read 1984, 2001, 2007, 2010, 2016; Leaf and Read 2012). This account, even though based on a single terminology, will make evident whether there is a logical basis by which the skewing of Crow and Omaha terminologies is generated, and from this, whether that logic applies equally to all other skewed terminologies and, if so, what this suggests about whether skewing in a kinship terminology is due to external factors impinging on the form of a kinship terminology, or is possibly due to the ways a kinship terminology would need to be modified for the kin terms to still be distributed consistently over the primary social units when there is change, for example, in the form of social organization.

The terminology to be analyzed is that of the Thonga-Ronga of (former) Rhodesia as described by the Belgian scholar, Henri Junod (1913). The Thonga terminology has been invoked as an ethnographic example with respect to theoretical issues regarding skewed kinship terminologies (see, for example, Radcliffe-Brown 1924; Goody 1959; Kopytoff 1964; Köbben, Verrips and Brunt 1974; Barnes 1976; Kuper 1976; and de Heusch 1974, 1978). The Thonga terminology is classified as being Omaha (Murdock 1957, 1967) and is said to be "a classic Omaha type" matching Lounsbury's (1964) Type III Omaha terminology (Webster 1986:620) and has "a qualitative difference between the cross-cousins, with those on the maternal side (the wife giving group) being 'elevated' a generation, while on the paternal side they are skewed downwards two generations" (p. 621). It is said to be "une variante du type dit omaha" (de Heusch 1978). (However, the formal account presented here suggests that the status of the Thonga terminology being a "classic Omaha type" may need reconsideration.)

Junod's detailed ethnography delineated the (perhaps surprisingly) close relationship between a man and his mother's brother even though the Thonga-Ronga are a patrilineal society. Junod argued that the close relationship was a survival from a prior matrilineal system, but that argument was discounted by A. R. Radcliffe-Brown (1924) who suggested, instead, that it resulted from extending the sentiment felt towards the mother to the mother's brother due to the equivalence of siblings. However, subsequent critiques of Radcliffe-Brown's argument by Goody (1959), Kopytoff (1964), and Kuper (1976) have shown that his argument, especially when applied to the Thonga-Ronga, is not in accord with the ethnographic evidence (see also Bloch and Sperber 2002). In a different theoretical direction, Junod's ethnography has been central to Luc De Heusch's (1974) argument in favor of a structuralist account of the close relationship between mother's brother and sister's son when that occurs in patrilineal societies. The important role that Junod's ethnography has played in the literature with regard to the mother's brother/sister's son relationship in patrilineal societies will be continued here by using his account to provide the cultural context for the formal account of the skewing in the Thonga terminology that will be presented in this paper.

Skewing in the Thonga Terminology Compared to Other Omaha Terminologies
To anticipate the results of the analysis to be presented here, the Thonga terminology is found to have a generative logic that accounts for the kin-term skewing of genealogical relations, including the grouping of grandparent with mother's brother, yet there is a fundamental, qualitative difference between the way the matrilateral kin terms of the terminology are structured in the Thonga terminology when compared with, for example, the Fox terminology that was the focus of Lounsbury's (1964) formal account of an Omaha terminology. This qualitative difference is not unique to the Thonga terminology. The Hokha Chin terminology of Burma (Lehman 1963) has essentially the same generative logic and matrilateral kin term structure as that of the Thonga terminology (Read nd), despite the absence of any historical contact between these two groups. The Hokha Chin terminology, then, differs qualitatively from the Fox terminology in the same way that the Thonga terminology differs from it. Additionally, the key generative property of the Thonga terminology giving rise to the skewed kin terms (to be discussed below) is that the female terms are generated from the male terms through kin term products[ii] of the male terms with a female self[iii] term. This generative basis for the female terms is also found in the skewed

terminology of the Hadza (Read In Press), a hunter-gatherer group in eastern Africa with a band form of social organization. Since the skewing in the Fox terminology, taken as a canonical Omaha terminology by Lounsbury (1964) for what he referred to as Type I Omaha terminologies, has a qualitatively different basis for the skewing than what occurs in the Thonga, the Hokha Chin and the Hadza terminologies, it follows that there are fundamental structural differences among terminologies that, even if they share the skewing of the same genealogical referents, are not simply variants on a single generative logic, but arise from qualitatively different logics.

The Hadza terminology is particularly instructive in this regard since, even though it has the same generative basis as the Thonga and the Hokha Chin terminologies, the skewing differs in a significant way from the skewing found in those terminologies. For the Thonga terminology, the skewing is encapsulated in the kin term, *kokwana* ('grandparent', 'mother's brother')[iv] through this term being reflexive in both the vertical direction (for kin term products beyond 'grandparent') and in the horizontal direction (for kin term products beyond 'mother's brother'), thus it provides a conceptual boundary for kin term products, thereby making what Radcliffe-Brown (1940) referred to as "a sort of legal fiction whereby the male relatives of the mother's lineage are grouped together as all standing towards an individual in the same general relation" (p. 204), much like *cousin* is a conceptual boundary term for more distant horizontal relations in the American/English terminology.

For the Hokha Chin terminology, rather than a single, neutral term like *kokwana* for both father's father and mother's father, and for mother's mother and father's mother, there are sex distinguished 'grandparent' terms, *pi* ('grandmother') and *pu* ('grandfather'),[v] but the terminology still maintains inclusion of mother's brother under a grandparent term, namely the term, *pu*. In the Hadza terminology, however, there is a different pattern for the way skewing occurs among the matrilateral male terms. In particular, the skewing of the 'mother's brother' term does not include the kin term product 'son' of 'mother's brother' = 'mother's brother', which is considered to be the defining feature of an Omaha terminology. Instead, it has the kin term product *ola* ('son') of *akaye* ('mother's brother') = *niye* ('brother'). These differences, even among terminologies sharing the same generative basis, indicate the importance of working out the generative logic of a terminology before making inter-terminology comparisons so that comparisons can be made at the same analytical level at which structural properties of a terminology are introduced through its generative logic. Otherwise, comparisons all too easily lead to invalid assumptions such as similarity in the consequent form implies the same causal basis.

The Kin Terms of the Thonga Terminology
Junod presents the kin terms of the Thonga terminology in two parts: first, the kin terms that correspond to the genealogical relations "mentioned by prof. [J.] Frazer in his questions" (p. 217), and second, elaboration on those terms by reference to two genealogies he had obtained from his informants.

With regard to the term *kokwana* and from a lineal perspective, the male genealogical relations included under this term can be divided into two groups: (a) 'ancestral (male) relatives of my father' and (b) 'ancestral (male) relatives of my mother'. This matches the way the Thonga-Ronga conceptually consider the term *kokwana* to refer to two different kinds of ancestral relatives

(Junod 1913:226). Also included in its genealogical referents are the matrilateral genealogical relations mother's brother, mother's brother's son ….; thus, the kin term, *kokwana*, refers to both mother's brother and to mother's brother's son. This skewing property, along with *mamana* ('mother') referring to mother's brother's daughter, provide the reason for the terminology to be considered an Omaha type of terminology. Since both grandfather and mother's brother are included in the category of genealogical referents for *kokwana*, the terminology also has the property that the 'grandfather' term is used for mother's brother. Thus, we need to account for both the skewing and the use of a grandfather term for mother's brother.

The hypothesis being considered here is that Thonga terminological properties like this arise internally through the structural logic of the terminology, rather than through external factors. To be shown below is that both of these features of the Thonga terminology are the consequence of: (1) a core structure for the male terms that is found in all classificatory/bifurcate merging terminologies considered to date, (2) a core structure for female terms consisting of a single position labelled by female self, and (3) and the term, *kokwana*, provides a conceptual boundary for kin-term products, thereby giving it categorical meaning that can be glossed, roughly, as 'ancestral relatives of my parents'.[vi]

As for the sibling terms, they include sex-marked terms said to be distinguished by elder and younger, as well as the single neutral, sibling term *makwabu* without an elder/younger distinction. At first glance, the term *makwabu* appears to be a covering term for the sex-marked sibling terms. However, we might expect that a covering term for a pair of terms with an elder/younger distinction would also have that distinction. The lack of an elder/younger distinction suggests that the term, *makwabu*, is more complex than just being a covering term for the sex-marked sibling terms. To see if this is the case, we first need to consider the fact that there appear to be two ways to refer to a genealogical sibling: (1) by the kin terms *nhondiwa* and *ndjisana* with the elder/younger distinction, and (2) by female self and male self when, from a man's viewpoint, the female self position is instantiated with his genealogical sister and so he refers to her as *makwabu*, or from a woman's viewpoint, when the male self position is instantiated with her genealogical brother and she refers to him as *makwabu*. This makes *makwabu* a neutral sibling covering term for female self and male self rather than a covering term for *nhondiwa* and *nsjiasna*, hence it follows that *makwabu* would lack an elder/younger distinction. Further, the primary meaning of the terms *nhondiwa* and *nsjiasna* is 'a man's same sex sibling', and the usage of these terms by a female speaker derives, as we will see, from transforming the male terms into female terms through kin term products with female self,[vii] which also indicates that *makwabu* is not simply a covering term for *nhondiwa* and *nsjiasna*.

The complexity in identifying a genealogical category definition for the sibling kin terms becomes even more pronounced through the fact that Junod indicates that a man's sister's son and daughter are referred to as *ntukulu*, a -2 generation term, hence if it were the case that a male speaker refers to his sister by *nhondiwa* or *nsjiasna*, this would lead to the contradiction that, on the one hand, the son or daughter of a person referred to as *nhondiwa* or *nsjiasna* is referred to as *ñwana*, a -1 generation term, yet, on the other hand, a male speaker refers to his sister's son and daughter by the -2 generation term, *ntukulu*. The structural reason that a male speaker's sister's

son or daughter is referred to by *ntukulu* will be clarified next, but this depends on first considering additional genealogical complexities of the kin term, *kokwana.*

The kin term *kokwana*, discussed briefly above, defies simple genealogical categorization. As already noted, at one level, *kokwana* refers to father's father, suggesting the translation 'grandfather', and, consistent with a patrilineal system, Junod (1913:222) indicates that the term is also used for 'grandfather' of 'father' and 'grandfather' of 'grandfather' (but the expression 'father' of 'grandfather' is never used). The term *kokwana* is also used to refer to mother's father. In addition, it is used to refer to mother's mother and father's mother, thus suggesting the translation 'grandparent'. However, it is also used to refer to mother's brother and, by a female speaker, for mother's brother's wife. The term is also used for the son of mother's brother; that is, 'son' of *kokwana* is *kokwana* when the person in question is the son of mother's brother. However, 'son' of *kokwana* is 'father' when the person in question is the son of father's father. Hence *kokwana* is polysemic in the sense discussed by Scheffler and Lounsbury (1971), and the genealogical relations associated with the term depend, minimally, on the genealogical relation of the connecting person to speaker.

Common to these genealogical referents for the term *kokwana* is that, as mentioned above, it provides a conceptual boundary (see Leaf and Read 2012), in an ascending sense, for the terminology. Thus, common to paternal grandfather, maternal grandfather, paternal grandmother, maternal grandmother, maternal uncle, maternal great-uncle, maternal male cross-cousin is the fact that there is no kin term, other than *kokwana*, in the terminology with genealogical referents "beyond" these genealogical relationships.

Given this observation, it follows that a male speaker refers to his sister's son/daughter by the kin term *ntukulu*, a -2 generation term, due to the reciprocity of kin terms. To see this, begin with *kokwana* as the kin term referring to a man's mother's brother. For this referent, the reciprocal of the term *kokwana* would be the kin term a man uses to refer to his sister's son. At the same time, the reciprocal of the term *kokwana,* in its primary meaning as 'grandfather', is *ntukulu*. Hence, a man refers to his sister's son by the reciprocal of the term *kokwana* and the reciprocal of the term *kokwana* is *ntukulu*, so a man refers to his sister's son by the term *ntukulu*.

We now form a kin term map (see Figure 1) for the terminology, using 'father', 'mother', 'son', 'daughter', 'ascending brother', 'descending brother', male self and female self as primary kin terms. The procedure for so doing is discussed next.

Kin Term Map for the Thonga Terminology
The kin term map for the terminology derived from Table 1 is shown in Figure 1. It is based on connections among the kin terms determined from kin term products with the primary terms listed in the box at the bottom of Figure 1. Recall that terms in red, here and below, are female terms; male terms are in blue and neutral terms are in black. Some exclusions have been made in this diagram. Affinal relations, for example, are not included since the focus here is on the consanguineal kin terms.
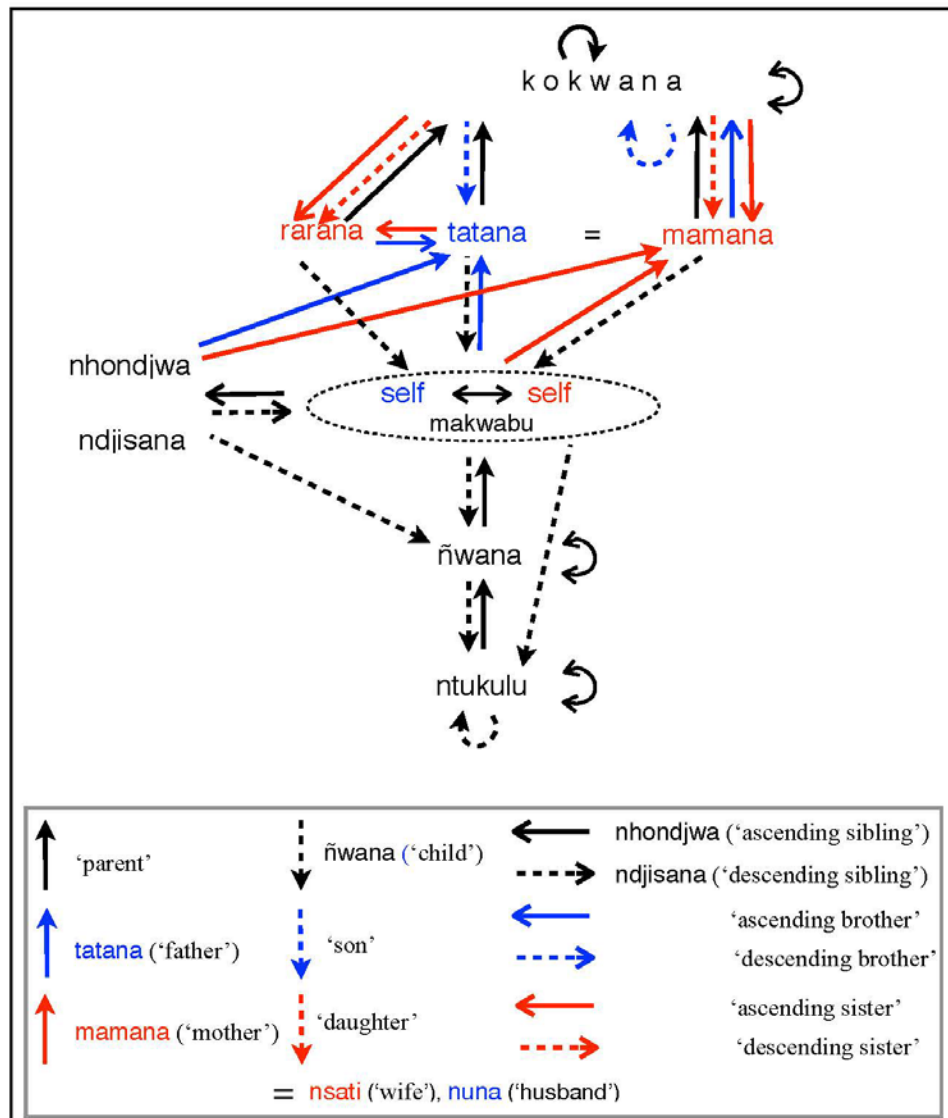
Table 1: Thonga-Ronga Kin Terms

Kin Term	Genealogical Category
tatana	father, father's brother, … ; mother's husband, mother's sister's husband, …
mamama	mother, mother's sister, … ; mother's brother's daughter, mother's brother's wife, father's wife, father's brother's wife, … ; co-wives
makwabu	brother, sister, father's brother's son, father's brother's daughter, father's sister's son, father's sister's daughter,… ; mother's sister's son, mohter's sister's daughter; [mother's brother's son (man speaking)]*, wife's sister's husband, "same paternal grandfather or great grandfather" (Junod 1913: 224)
ñwana	son, daughter
kokwana	father's father, father's father's father, … ; father's mother, mother's father, mother's father's father, … ; mother's mother, mother's brother, woman's mother's brother's wife
malume/kokwana	mother's brother, mother's brother's son#
rarana	father's sister, father's father's sister, …
ntukulu	son's son, son's daughter, daughter's son, daughter's daughter, man's sister's son, man's sister's daughter (Junod 1913:225, 226)
nhondjwa	elder brother, elder sister, wife's elder sister's husband
ndjisana	younger brother, younger sister, wife's younger sister's husband
mukonwana	wife's father, wife's mother, wife's elder sister, wife's sister's husband
nwingi	husband's father, husband's mother, husband's older brother, younger brother's wife
namui	husband's younger brother
nhombe	husband's sister
namu [namui?]	father's sister's husband, elder brother's wife, wife's younger sister, husband's younger brother
nuna, nkata	husband
nsati	wife, man's mother's brother's wife

* Junod indicates that mother's brother's son (male speaker) is referred to as *makwabu* or *ñwana*; however this is contradicted by his discussion stating that the son of *malume* ('mother's brother') is *malume*. See next note.
# The kin term *malume* is an alternative term for *kokwana*: "As regards the son of my *malume*, he is also a *malume* or a *kokwana*" (Junod 1913:229).

In the kin term map, a solid black (neutral) upward vertical arrow shows the result of taking kin term products either with *tatana* ('father') or *mamana* ('mother').[viii] The downward vertical dashed arrow represents the reciprocal term for *tatana* or *mamana* and shows the result when taking the kin term product of a kin term with either (male) *ñwana* ('son') or (female) *ñwana* ('daughter'), though it should be noted that kin term products with *ñwana* are not equivalent to determining genealogical child with its implication that son and daughter are siblings since (male) *ñwana* ('son') of *kokwana* (with 'son' shown by a blue dashed arrow and a solid arrowhead in Figure 1) is *tatana* and (female) *ñwana* ('daughter') of *kokwana* (red dashed arrow) is *mamana*, but *tatana* and *mamana* are not siblings. (The logic underlying the kin terms represented by the kin term product, *ñwana* of *kokwana*, will be detailed below when we work out the generative logic of the terminology.) Horizontal arrows show products with 'brother' (either with black

[neutral] or with blue [male] arrows) or 'sister' (either with black [neutral] or with red [female] arrows). The arrow connection between male self and female self is that of 'sibling'; when the two self positions are instantiated by persons who are genealogical siblings to each other. As already

Figure 1: Kin term map of the Thonga terminology, based on Junod (1913: Table1). The box shows the primary generating kin terms and their corresponding arrows for kin term products. For some terms, there is no covering term (e.g., there is no kin term with translation 'parent'), and for some terms that are covering terms, there is no kin term for the sex marked from of the term (e.g., for the kin term *ñwana* there are no sex marked kin terms with translation 'son' or 'daughter'). (See text for more details.)

noted in the previous section, the term *kokwana* (see top of graph in Figure 1) is a covering term for two different uses of *kokwana*: as the boundary term for speaker's father's lineage and as the boundary term for speaker's mother's lineage.[ix]

The kinship terminology structure, as I will show below, is built around a core structure of vertically connected male terms (see Figure 2). Though generation -1 and -2 terms are neutral in the Thonga terminology, these terms are first generated (see below) as male terms, then are transformed into female terms through products with female self,[x] and finally become neutral terms since they may be used to refer to either male or female persons. Thus, the structure shown in Figure 1 is primarily a structure of male terms, and only in a transformed sense do the -2 and -1 generation terms in this structure have female referents.
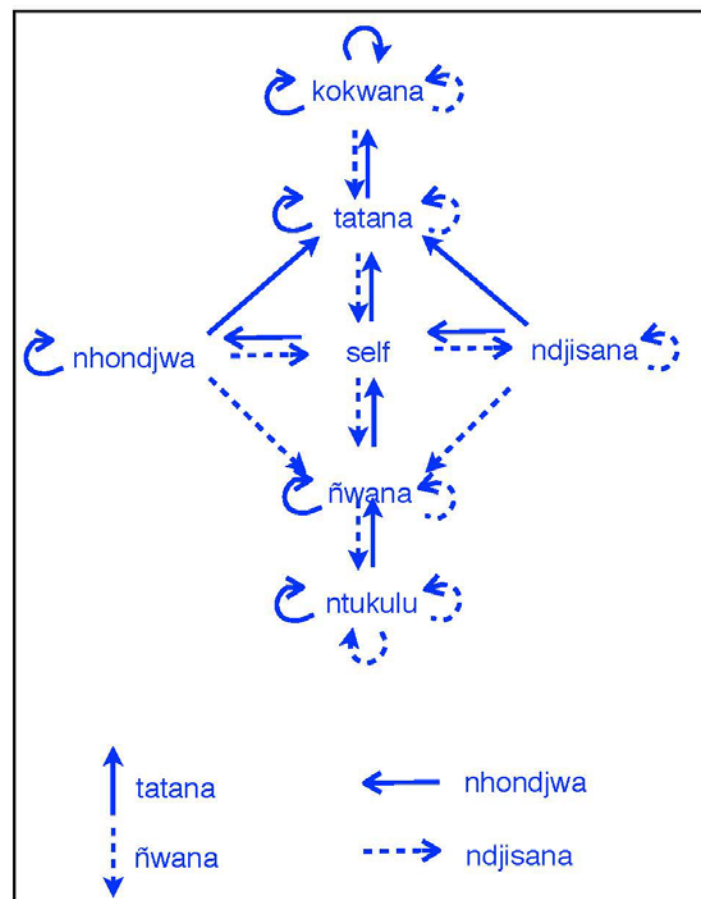
Figure 2: Kin term map of male terms.

In other classificatory terminologies, there is both a structure of male terms and a parallel, isomorphic structure of female terms, with these two structures joined together to form a single structure (Read 2007, Leaf and Read 2012). Here, however, there is a structure of male terms and a single female term, self, from which the female kin terms are derived by taking the product of self with the male kin terms. This accounts for the asymmetry between the lineal structure of male

kin terms (which is in accord with the fact that we are dealing with a patrilineal system) and the fact that there are only two female kin terms that are not simply the female form of male terms (hence all terms used to refer to females, other than these two terms, are neutral in the terminology), namely *rarana* ('father's sister') and *mamana* ('mother'). For these two terms, the former is a label for a position in a male speaker's lineage and the latter is the only female position in the male speaker's mother's lineage identified by a kin term. As mentioned above (and shown below in detail), other than *mamana* and *rarana*, all of the terms used to refer to females are male terms transformed into female terms through taking products with self.

Also, as will be shown below, in addition to providing a structural basis for the skewing and the use of *kokwana* for mother's brother, the generative logic of the terminology accounts for why the term, *rarana* ('father's sister'), has translation as 'female father' (Junod 1913:223).[xi] This result discounts Radcliffe-Brown's argument for the 'female father' meaning of *rarana* derived from his theory of the avunculate and based on his misreading of Junod's account of the Thonga-Ronga to the effect that speaker's nephew must show great respect to his father's sister (Kuper 1976): "even greater respect than he does his own father" (1924:547). However, a Thonga nephew may have great familiarity with his *rarana* yet not with his father (Jacques 1929, referenced in Kuper 1976). Further, the generative logic of the terminology shows that the meaning of *rarana* as 'female father' does not derive from linguistically marking the status of speaker's father's sister *vis-à-vis* speaker's father, but instead expresses the fact that *rarana* is 'female father' as a consequence of the generative logic of the terminology. Altogether, Radcliffe-Brown's attempt to account both for *rarana* meaning 'female father' and the use of the term *kokwana* to refer to mother's brother, mother's brother's son and mother's father by applying his theory of the avunculate to the Thonga-Ronga is unnecessary since the generative logic of the terminology already accounts for the genealogical referents of the terms *kokwana* and *rarana* without needing to apply his avunculate hypothesis to a patrilineal society.

Generative Logic of Kinship Terminologies
The goal of the formal analysis to determine the logic by which the structure of the Thonga kinship terminology shown in Figure 1 with its skewing of male, matrilateral kin terms, can be generated — or, alternatively, that there is no such logic upon which the terminology is based. This involves linking the generation of kin terms from a primary set of kin terms, using the kin term product, to a sequential procedure that has been worked out for generating the terminology in a layer-like manner (see Read 2007; Leaf and Read 2012) by beginning with internal structuring factors through first forming a structural core of ascending kin terms, next forming the descending kin terms, then introducing sex marking of kin terms, and lastly introducing affinal terms, and then considering external factors through a layer of kin term properties specific to the cultural and social context for the kinship terminology.

To illustrate how kin terms are generated using the kin term product, consider the English terminology and suppose that the kin term *parent* has been identified as a primary kin term. Begin by forming the kin term product of *parent* with itself — *parent* of *parent*. From a cultural perspective, if this kin term product relation has been included in the kinship terminology, then it was given a name by culture bearers (at some time in the past) and thereby the kin term product

was incorporated as a kin term. Then, since *parent* of *parent,* became a named kinship relation, we can, as researchers, elicit its name from culture bearers (see Leaf 2006) and when we do so, we obtain the kin term name, *grandparent*. Thus, *grandparent* is a kin term in the kinship terminology whose structural meaning is given by the kin term product it names and so we have the structural equation, *grandparent = parent* of *parent*, as part of the kinship terminology; that is, *grandparent* is the kin term speaker uses to refer to person B when speaker refers to person A as *parent* and A refers to B as *parent*. Or, to put it another way when speaker refers to person B as *grandparent*, then culture bearers know that there must be a person A referred to by speaker as *parent* who, in turn, refers to person B as *parent*.

Kin terms are also generated through the kin term product of a primary term with any kin term that has already been generated from kin term products of primary kin terms. Thus, we form the kin term product, *parent* of *grandparent,* and determine if this product defines a kin term that is part of the terminology. If so, the product has a name, in this case *great-grandparent,* and so *great-grandparent* is a kin term in the kinship terminology with meaning given by the kin term product, *parent* of *grandparent*. Note that when kin terms are generated in this manner, the associated genealogical connections, if any, are not determinative of the kin terms but instead are the consequence of how a kin term is generated using kin term products (see Read 2018 for details).

Not all kin term products with primary terms lead to kin terms. For example, for the generating terms *parent* and *spouse*, *spouse* of *parent = parent-in-law* is a kin term, but the kin term product, *parent* of *parent-in-law* (= *parent* of *spouse* of *parent*), is not recognized as a kin term in the English kinship terminology even though the product is meaningful. Thus, for English speakers, the kin term product, *parent* of *parent-in-law*, is not named and so there is no kin term whose meaning is *parent* of *parent-in-law*.

The structural form of the kinship terminology shown in a kin term map is determined by structural equations that simplify kin term products, but for a structural equation to be included as part of a kinship terminology it must be culturally salient; that is, it must derive from kinship ideas held by culture bearers of that terminology. For example, for the generating terms *parent* and *spouse*, the structural equation, *spouse* of *parent = parent* is culturally salient since one of the functions of marriage in American society is to culturally recognize a male and female being joined in marriage as the mother and (presumed) father of that female's (future) offspring (Chit Hlaing and Read 2016). Thus, this equation is included as part of the generative logic of the English kinship terminology.

All possible kin term products of primary kin terms with any generated kin term must be evaluated as to whether the product either determines a new kin term, reduces it to a kin term already part of the kinship terminology, or does not determine a kin term. This process of evaluating kin term products continues until we reach closure; that is, no additional kin terms are determined by taking kin term products in the manner described above.

A kinship terminology, as a whole, is generated in a layer-like manner, consistent with the kinship ideas of culture bearers. The first layer is a core structure of ascending kin terms generated using primary ascending kin term(s) identified as the generating term(s) for the ascending structure. Previous accounts of the structural logic of kinship terminologies (e.g., Read 2007, Leaf

and Read 2012) have shown that for the descriptive terminologies, an ascending generator will be a 'parent' kin term, either neutral or sex-marked. For a classificatory terminology, however, the ascending generators also include a 'sibling' primary kin term, and it is the inclusion of a 'sibling' ascending generating term (in addition to a 'parent' ascending generating term) that leads to the generation of a classificatory terminology.

In the next layer, including the kinship idea of the reciprocity of kinship relations, a descending structure of kin terms reciprocal to the kin terms making up the ascending structure (and isomorphic to the ascending structure) is generated. These two structures are joined to make a single structure of ascending and descending kin terms. Different ways that these two structures may be joined leads to different terminologies (see Read 2013a).

Sex marking of kin terms is then introduced and there are several ways that this may be done. For most terminologies, it is done by making an isomorphic copy of the structure of ascending and descending kin terms and then one of these two structures becomes a structure of male (possibly including neutral) kin terms and the other a structure of female (possibly including neutral) kin terms. These two structures are then joined to make a single structure. The different ways these two structures can be joined are the basis for the Polynesian terminologies versus the Australian terminologies versus the Dravidian terminologies (Read 2013a).

The next layer is composed of affinal terms. This may involve introducing affinal generating terms, depending on the terminology.

Lastly, properties of the kinship terminology specific to the cultural context are introduced. For example, the difference between the English terminology with a neutral *cousin* term and the French terminology with a sex-marked *cousin*/*cousine* distinction has a cultural basis rather than being a consequence of the logic regarding how terminologies are generated.

By the generative logic of the terminology, then, we mean the primary kin terms that are used to generate kin terms for the terminology, the culturally salient structural equations that give the terminology its particular structural form, and the reduction of kin term products of generating terms with kin terms using the structural equations, all assembled together in the layer-like manner outlined above. Terminologies differ from one to the other through choice of generating terms and the structural equations, and are similar through being generated in the layer-like manner discussed above.

Generation of the Structure of Ascending and Descending Kin Terms in the Thonga Terminology

As noted in the previous section, we generate the Thonga terminology by first generating the structure of ascending and descending male terms shown in the kin term map of male terms displayed in Figure 2, with the correspondence between arrows and primary kin terms forming the kin term products shown below the graph. As in Figure 1, an arrow identifies the result of taking the kin term product of a kin term with the primary kin term corresponding to the arrow; e.g., a solid blue arrow, corresponding to the primary kin term *tatana*, goes from *nhondjwa* to *tatana*, showing that *tatana* ('father') of *nhondjwa* ('ascending brother') = *tatana* ('father'). This core

structure of ascending terms, it should be noted, is also found in other classificatory terminologies (Read 2016).

For our purposes here, we will only outline the generative logic for the structure of ascending and descending male terms since the details of that logic can be found in other publications (e.g., Read 2007, 2010, 2014; Bennardo and Read 2007; Leaf and Read 2012). Instead, our focus is on generating the Thonga terminology from this structure so as to determine whether the skewing property of this terminology arises from its generative logic.

Core Structure of Ascending and Descending Male Kin Terms

We begin with the male generating terms *nhondjwa* ('ascending brother')[xii] and *tatana* ('father'), along with the male self term, denoted by self. As has already been shown with the terminologies of the Tonga (Bennardo and Read 2007), the Kariera (Leaf and Read 2012), the Trobriand Islanders (Read and Behrens 1990), and other classificatory terminologies (e.g., Read 2010, In Press, nd), this set of primary terms suffices to generate the structure shown on the left side of Figure 3 (reflexive arrows are not shown to keep the diagram simple), where *ndjisana* ('descending brother') is the reciprocal of *nhondjwa* and *ñwana* ('son') is the reciprocal of *tatana*. Briefly, this structure is formed by first generating a structure of ascending terms, using self, *nhondjwa*, and *tatana* as the ascending generating terms, along with the structural equation *tatana* ('father') of *nhondjwa* ('ascending brother') = *tatana* ('father'). Next, form an isomorphic structure of descending terms using self, *ndjisana*, and *ñwana* as the descending generating terms, and then include the structural equation, *tatana* ('father') of *ñwana* ('son') = self, that makes *tatana* and *ñwana* into reciprocal terms, and the structural equations, *nhondjwa* of *ndjisana* = self = *ndjisana* of *nhondjwa,* that make *nhondjwa* and *ndjisana* into reciprocal sibling terms.

The logic of reciprocity, a fundamental aspect of kinship relations, leads to the classificatory equations *nhondjwa* ('ascending brother') of *tatana* ('father') = *tatana* ('father') and *ndjisana* ('descending brother') of *tatana* ('father') = *tatana* ('father')*,* and their reciprocal equations, *ñwana* ('son') of *ndjisana* ('descending brother') = *ñwana* ('son') = *ñwana* ('son') of *nhondjwa* ('ascending brother') (see Leaf and Read 2012 for details) being part of the generated structure. Strikingly, precisely this generated structure is repeated in all of the classificatory terminologies examined to date.

The structure generated in this manner is shown on the left side of Figure 3, and, when the reflexive arrows are included, is isomorphic to the kin term map shown in Figure 2. Note that the two 'brother' terms are placed on the left side of the structure in Figure 3 simply as a way to free up space on the right side of diagram for including the female self term, denoted by self.

The next step is to introduce female terms. In other classificatory terminologies, this is done by making an identical copy of the male structure using female generating terms in place of the male generating terms (Read 2007, Leaf and Read 2012). Here, however, a different procedure for generating the structure of female terms will be used. The key to the skewing in the Thonga terminology lies in reducing the generated structure for female terms to a minimum by only using self as a generating term. Since self of self = self, it follows that there is just a single position in the structure of generated female terms, namely the self position shown on the right side of Figure 3. This implies that there will be an inherent asymmetry between male terms that refer to agnatic

relations defined in relation to a male self term through using kin term products with *tatana* ('father'), its reciprocal term *ñwana* ('son') and the sibling term *nhondjwa* ('ascending brother') with its reciprocal term *ndjisana* ('descending brother'), on the one hand, and female terms defined through the single female generating term, self, on the other hand. This asymmetry in the generated structure of male terms *vis-à-vis* female terms has been noted in an ethnographic account of the Kyrgyz of Central Asia, a group with an Omaha kinship terminology. For the Kyrgyz, "Patrilineal or agnatic kin have one set of terms, and those *related through women* [i.e., through female self] have another set of terms" (Schlee 2017: 119, emphasis added).
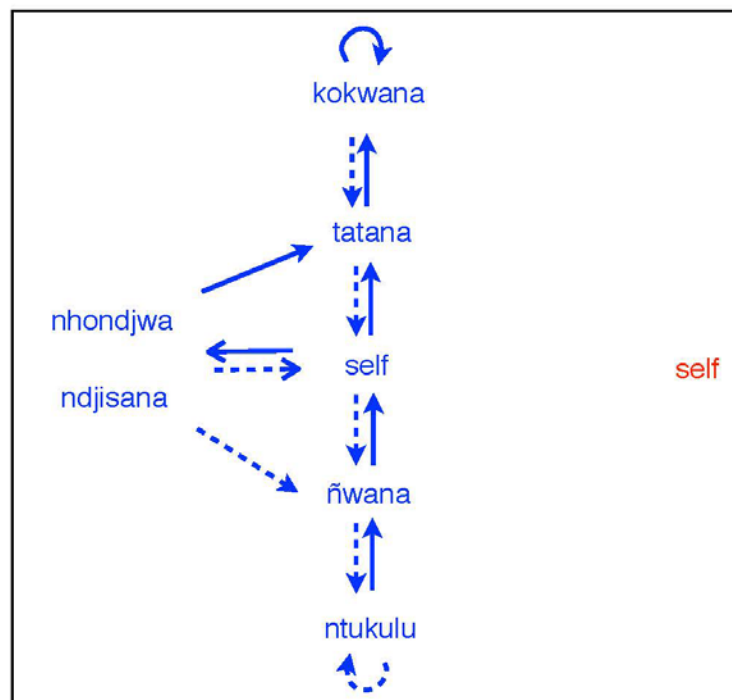

Figure 3: Left side: Structure of male marked terms generated from the male marked generators, male self, *tatana* ('father') and *nhondjwa* ('older/ascending brother'). Right side: The only generating term is female self, so no structure of female marked terms is generated.

Joint Structure of Male Terms and Female Terms

We now join together the two structures shown in Figure 3 so as to make a single structure of kin terms. This involves two steps: first, connecting the (male) self position to the (female) self position, and second, computing the kin term product of self with the male terms to generate the female terms.

For the first step, the (female) self term is connected to the (male) self term through kin term products when the self position is instantiated by genealogical brother with respect to a female speaker and the self position is instantiated by genealogical sister with respect to a male speaker,

thus there is a sibling relation connecting self to self, and vice-versa. In the Thonga terminology, this relation is identified by a single term, *makwabu*, for both 'brother, female speaking' and 'sister, male speaking', hence *makwabu* can be translated as 'opposite sex sibling'. In Figure 4, the dashed ellipse includes all of the elements involved in joining the two structures in Figure 3 together: the (male) self term, the (female) self term, the kin term *makwabu,* and kin term products using *makwabu*, shown by the double headed arrow that connects self with self: *makwabu* of self = self and *makwabu* of self = self.[xiii] Thus *makwabu* maps the self position to the self position and vice-versa under the stipulation that when the two self positions are instantiated from the viewpoint of speaker, they are instantiated with speaker and speaker's opposite sex sibling.
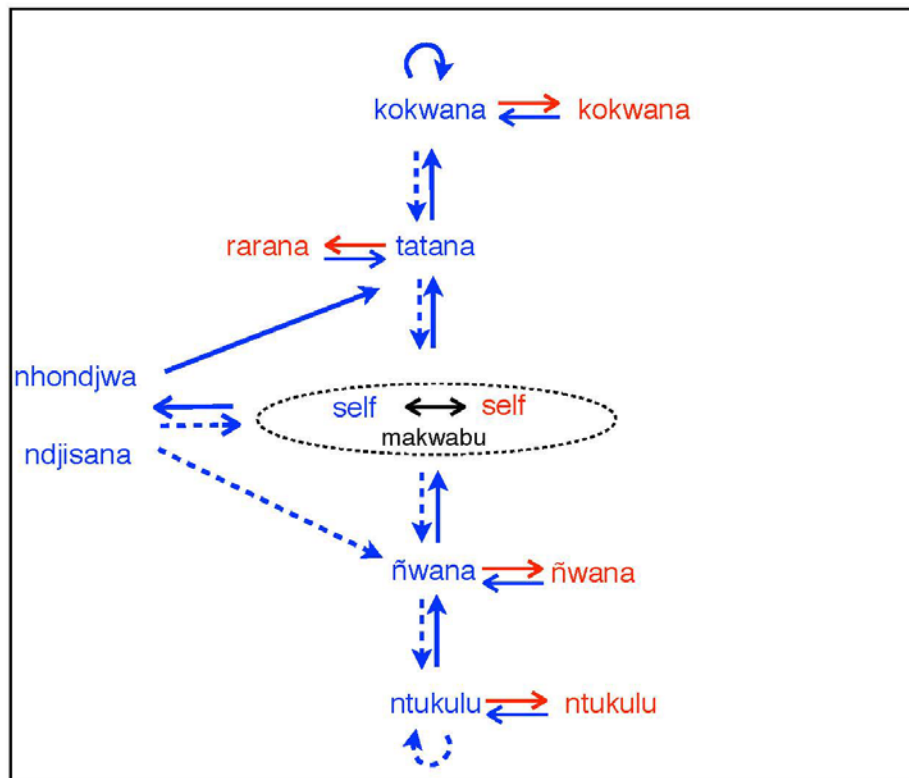
Figure 4: Female marked terms generated through kin term products of self with male marked terms.

For the second step, we generate female terms through the product of self with the male terms, and then introduce a neutral covering term for the pair of male/female terms generated in this manner. However, since self is not a kin term, we need to represent the product of self with a male term through a kin term product that has the same outcome. We do this by forming the kin term product with the covering term, *makwabu,* for self and self, in place of self. Since *makwabu* is a covering term for self and self, *makwabu* of K, where K is a male kin term, is either self of K or self of K. Of these two products, self of K = K and so the only new product introduced by *makwabu* of K is self of K, hence we can use the kin term product, *makwabu* of K, to represent the product, self of K. The female terms generated in this manner are shown in Figure 4.

Given the above convention for representing products with self, it follows that in the -1 generation, the kin term product *makwabu* ('opposite sex sibling') of *ñwana* ('son') will be labelled by the kin term *ñwana* ('daughter'), the female form of *ñwana* generated by the product, self of *ñwana*. Reciprocally, *makwabu* of *ñwana* is *ñwana* (see Figure 4). Then *ñwana* and *ñwana* are replaced by the covering term *ñwana* ('child'),[xiv] and with this covering term, we have the kin term equation: *makwabu* of *ñwana* = *ñwana* (see reflexive arrow for *ñwana* in Figure 5).
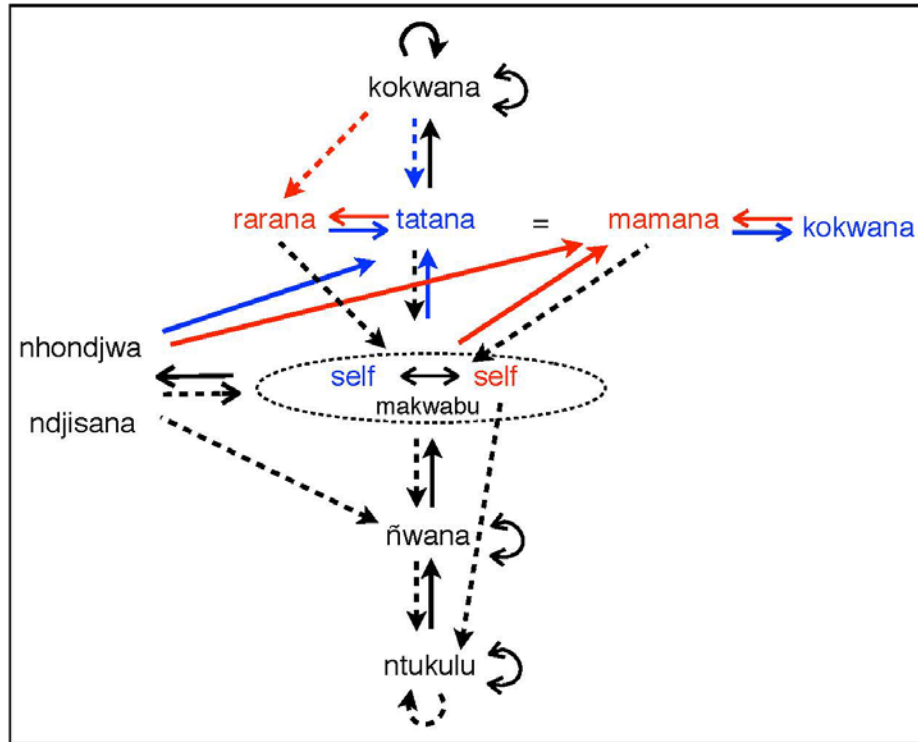
Figure 5: Replacement of a male marked and a female marked term with a neutral term when both a male marked and a female marked arrow points to or from the sex marked terms. Thus, since *ñwana* of self = *ñwana* and *ñwana* of self = *ñwana*, this pair of equations may be replaced by the single equation, *ñwana* of self = *ñwana*. The affinal relation between *tatana* and *mamana* has been included. Products of *mamana* with *ñwana* and with *ñwana* have also been included (See text for details.)

Similarly, in the -2 generation, the kin term product *makwabu* of *ntukulu* is labelled by the kin term *ntukulu*. Reciprocally, *makwabu* of *ntukulu* is *ntukulu* (see Figure 4). Thus, *ntukulu* and *ntukulu* can be replaced by the covering term *ntukulu* ('grandchild'), and with this covering term, we have the kin term equation: *makwabu* of *ntukulu* = *ntukulu* (see reflexive arrow for *ntukulu* in Figure 5).

In the +2 generation, *makwabu* ('opposite sex sibling') of *kokwana* ('grandfather, grandfather's brother, …') is labelled by kin term *kokwana* ('grandmother, grandfather's sister, …'). Reciprocally, *makwabu* of *kokwana* is *kokwana* (see Figure 4). Thus, *kokwana* and *kokwana*

can be replaced by the covering term *kokwana* ('grandparent'), and with this covering term, we have the kin term equation: *makwabu* of *kokwana* = *kokwana* (see reflexive arrow for *kokwana* in Figure 5).

In the +1 generation, the kin term product, *makwabu* ('opposite sex sibling') of *tatana* ('father'), is labelled by *rarana* ('father's sister') (see Figure 4). Recall that *makwabu* of *tatana* is the kin term product expression for self of *tatana*. The product, self of *tatana*, is, by the logic of taking products using self, 'female father', just as self of 'male sibling' is 'female sibling.' Strikingly, in the Thonga-Ronga expression for 'your aunt', "*rarakati wa ku,*" *rarana* becomes *rarakati* and *rarakati* literally means "female father" (Junod 1913: 223). Thus, *rarana* carries with it both the meaning 'female father' and the meaning 'father's sister', hence the way *rarana* is generated implies that a paternal aunt can be thought of as a 'female father'.

It is not her behavior, though, that makes her a 'female father', for she "bears no trace of the inhibitions caused by the father's presence" (Joshua 1927: 347-348). The generative logic of the terminology, then, makes it evident that *rarana*, with the meaning 'female father', is not a cultural fact that requires explanation via, for example, Radcliffe-Brown's avunculate hypothesis applied to a patrilineal kinship system, but is more simply explained by the kin term *rarana* being the linguistic label for the product of self with *tatana,* which transforms *tatana* into its female form.

Also, the kin term product, *ñwana* of *rarana*, has the following simplification: *ñwana* of *rarana* = *ñwana* of (*makwabu* of *tatana*) = (*ñwana* of *makwabu*) of *tatana* = *ñwana* of *tatana* = *makwabu* (see dashed arrow in Figure 5 starting at *rarana*). In the 0 generation, the kin term product *ñwana* of self (man speaking) [read: "'child of sister, man speaking"] is derived as follows. Since *makwabu* ('brother') of *mamana* ('mother') (man speaking) = *kokwana*, then by reciprocity of equations, *mamana*[r] of (*makwabu*)[r] (man speaking) = *kokwana*[r], where the superscript "r" on a kin term denotes that this is the reciprocal term for the kin term on which the "r" appears as a superscript. For the left side of this equation, *mamana*[r] of (*makwabu*)[r] (man speaking) = *ñwana* of self (man speaking). For the right side of this equation, *kokwana*[r] = *ntukulu* ('grandchild'). Thus, *ñwana* of self (man speaking) (read: "'child' of 'sister', man speaking") = *ntukulu* ('grandchild') (see dashed arrow in Figure 5 starting at self).

In sum, except for *mamana* (discussed in the next two sections) and *rarana*, female terms are not added to the structure of male terms by adding female terms in new structural positions, as is the case with other classificatory kinship terminologies. Instead, the structure of male terms is transformed into a structure of neutral terms that subsume female kin terms transformed from male kin terms.

The 'Wife' Term: *Nsati*

With self as the only female generating kin term, it follows that *mamana* ('mother') is not a primary kin term from the perspective of generating a structure of kin terms. Instead, *mamana* becomes the label for the kin term product, *nsati* ('wife') of *tatana* ('father') (see "=" sign in Figure 5). For this to be culturally salient, though, *nsati* must be considered as a primary generating relation and *mamana* as a non-primary relation from the viewpoint of the generative logic of the terminology.

However, Junod (1913) neither compares nor contrasts *nsati* with *mamana* in his extensive ethnography on the Thonga-Ronga. Nonetheless, which of these two relations should be considered to be primary is suggested by the 'great'/'little' distinction attributed both to the genealogical relations associated with the kin term *tatana* and to the co-wives derived through the *nsati* relation, and the fact that this distinction does not occur for the genealogical relations associated with the kin term *mamana*.[xv] With regard to *tatana*, a man refers to the elder brother of his father as "batatana ba shirare" ('great father') (p. 222), whereas a younger brother is referred to as "ktatana lwe'ntjongo" ('little father') (p. 222). The same 'great'/'little' distinction occurs with *nsati*: the first wife of a man is the 'great wife' (p. 125) and the co-wives are 'little wives': "The first wife is certainly the most respected; she is called the 'great one' (nsati lwe nkulu); those who are taken in marriage afterwards being the 'little wives'. She is the *true wife* …" (p. 186, emphasis added). In addition, there is a "kind of sacredness which surrounds the first wife" (p. 273). Her central importance is reflected in funeral rites that the first wife must perform upon the death of her husband, and, conversely, in the funeral rites that a man performs only for the death of his first wife and not for his other wives (p. 273).

In addition, a *nsati* arises through a polygamous system fundamental to Thonga-Ronga kinship: "the two great customs which lie at the base of the whole present family system of the Thonga [are]: Lobola [brideprice] and Polygamy" (p. 258). It is through polygamy that a man establishes his reputation: "the greatness of an African [man] … is closely connected with polygamy" (p. 128) and his wealth is demonstrated through the *lobola* payments required for each wife. Not only do wives represent wealth, they are also part of an inheritance system that stipulates which male relative inherits, as a wife, which one of a man's wives upon his death (pp. 248-250). Thus, just as the logic of the kinship terminology determines a category of father's brothers with a 'great'/'little' hierarchy associated with *tatana*, the logic of marriage and the *lobola* payments give rise to a category of wives with a 'great'/'little' hierarchy associated with *nsati*.

The primary importance of *nsati* is also expressed spatially through the topological layout (see Hamberger In Press) for what Junod refers to as a Thonga-Ronga village, which is circular in shape and surrounded by a low fence. The hut of the headman is at the opening in the fence used for entering the village and the huts of his *nsati* form an arc parallel to the fence and located in the village opposite the entry. Their order along the arc matches their order as *nsati*. Next come the huts with the *nsati* of his brothers, and behind them, on one side, is the hut for the sons and the hut for the daughters of the *nsati*. Altogether, the village is not just a physical space, but "is a social organism whose composition is well defined and which is regulated by strict laws" (p. 281). The spatial organization of the village centers around a man and his *nsati*, his brothers and the *nsati* of his brothers, thus spatially marks the centrality of *nsati* in the Thonga-Ronga kinship system.

The emphasis on *nsati*, as opposed to *mamana*, can also be seen in the fact that "the principal wife of a reigning chief … is called 'wife of the country' (nsati wa tik)" (p. 341), not the 'mother of the country'. The cultural importance of the *nsati* relation can also be seen in the fact that for a sterile woman, "[t]he husband has the right of sending his wife home. But, generally, the parents of the woman find a *nhlampsa*, viz. a younger girl, and *give her to the husband as a second wife*" (p. 188, emphasis added), thus underscoring that a female as *nsati* has primary importance in comparison to that same female as *mamana* in a procreative sense. Conversely, the secondary

importance of *mamana* can be seen in the fact that "[g]eanologies … mention only the ancestors of the father. They are recalled much better than those of the mother" (pp. 257-258).

Finally, that *mamana* is defined through the kin term product, *nsati* of *tatana*, rather than being a primary kin term with respect to the generative logic of the Thonga terminology, is further corroborated by the genealogical example Junod (1913:225) provides of a boy referring to his maternal female cousin as *mamana* because she is a *potential wife* for the boy's father, so she refers to him as *ñwana* ('son') and, reciprocally, he refers to here as *mamana* (Junod 1913: 228).[xvi] It is the kin term product equation, *nsati* of *tatana* = *mamana*, that leads to the use of the term, *mamana*, in this example, not procreation.[xvii]

The 'Mother' Term: *Mamana*

Since we have added the term *mamana* (*via nsati of tatana*), for completeness we also need to determine the products of *mamana* with the 'parent', 'child' and 'sibling' kin terms. We begin with the sibling kin term product, *makwabu* of *mamana*. The resulting term, from Junod's (1913) ethnography, is *kokwana*, so *kokwana* is the term used to refer to mother's brother. Next, we include arrows to show the result of taking products of the 'child' kin terms, *ñwana* and *ñwana*, with *mamana*. It follows that the reciprocal of *mamana* for a female speaker would be *ñwana* and for a male speaker its reciprocal would be *ñwana*. As discussed above, when we have the same term in both red and blue (e.g., the two sex marked forms of *ñwana*), we replace the two copies by a single neutral term in black, and when we have both a blue and a red arrow with the same shaft and arrowhead, we replace it by a single black arrow with that shaft and arrowhead (see the black arrow indicating *ñwana* ('child') starting from *mamana* in Figure 5). For the products of *mamana* with 'parent' kin terms, we need to consider in more detail the kin term *kokwana* and its transformed female form, *kokwana,* introduced previously.

The Boundary Kin Term: *Kokwana*

The neutral term *kokwana* is used for all males in speaker's lineage ancestral to speaker's father. It also includes females of the same generation as these males due to *kokwana* being the covering term for *kokwana* and for *kokwana* = self of *kokwana*. Thus, *kokwana* is the outer kin term boundary for the patrilineal lineage structure. The same boundary logic is repeated in the mother's lineage with the term *mamana*. That is, *tatana* of *mamana* is *kokwana* and *mamana* of *mamana* is *kokwana*, and for any higher, ascending generations we only find the term *kokwana* (Figure 6). For conceptual clarity, it is helpful to distinguish temporarily between these two uses of *kokwana*: (1) as the boundary of speaker's father's lineage and (2) as the boundary of speaker's mother's lineage. To do this, an "a" or a "b" has been (temporarily) attached to *kokwana* in Figure 6 to distinguish these two uses of *kokwana*. In the downward direction from *kokwana-b* in the mother's lineage, 'daughter' of *kokwana-b* can be (and is) *mamana* and 'son' of *kokwana-b* can be (and is) *kokwana* since this is the only matrilateral, +1 generation, male marked term. This gives us the structure shown in Figure 6.

Although there is, in actuality, only a single term *kokwana*, it is analytically useful to think of *kokwana* as a cover term (at a minimum) for the following two meanings of *kokwana*: (1) the boundary for father's lineage (*kokwana-a*) and (2) the boundary for mother's lineage (*kokwana-*

b), or alternatively: (1) the males of father's lineage and (2) the males of mother's lineage, with the former standing in a superior relation to the latter. Strikingly, this is precisely the distinction that the Thonga-Ronga make: "kokwana means first the paternal grandfather and all the ancestors on the father's side, and this is its *proper essential meaning*" (p. 226, emphasis added). These are the *kokwana* derived through kin term products using *tatana*. With regard to the *kokwana* derived through *mamana*, using kin term products with *tatana*, they say: "all my mother's male relatives … form a group which I [Mboza] call 'ka bakokwana' which means my mother's home…. 'The bushaka on the father's side [consanguineal relatives of father] is the head; on the mother's side, only the legs'" (p. 226, with embedded quote attributed by Junod to Junod's informant, Mboza).
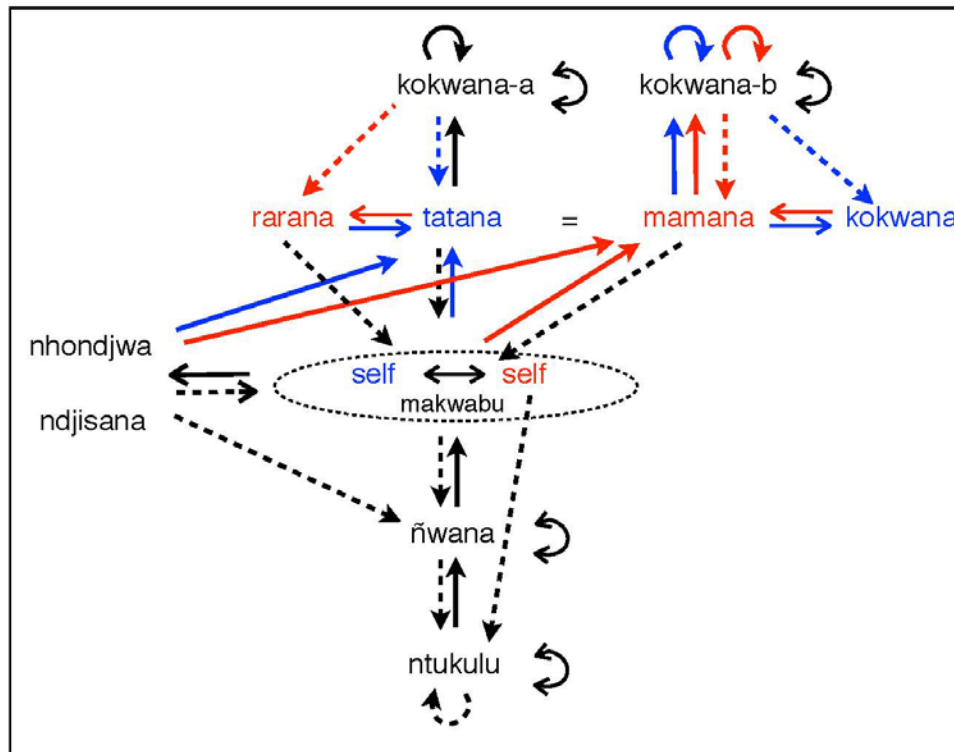

Figure 6: The term *kokwana* is the outer, upper boundary for the generated kin term structure. (See text for details.)

We now re-introduce *kokwana* as a covering term for *kokwana*-a, *kokwana*-b and *kokwana* (see Figure 7). This completes the generation of the Thonga terminology with its skewed structure. The structure we have generated (see Figure 7) is isomorphic with the kin term map in Figure 1.

Skewing of the 'Mother's Brother' Kin Term *Kokwana*
The skewing of kin terms, including mother's brother as a referent of the kin term *kokwana*, derives, as shown in Figure 7, from the kin term products involving *mamana* and *kokwana*. The "peculiarity" of a 'grandfather' term for mother's brother is only due to looking at the terminology from the perspective of a genealogical grid rather than through the generative logic of the

terminology. The term *kokwana* denotes, essentially, "ancestral relatives of my parents," a grouping that can be conceptually divided into those ancestral to my father (*kokwana-a*) and those ancestral to my mother (*kokwana-b*). Mother's brother is included in the latter because the only candidate for *ñwana* ('son') of *kokwana-b* is *kokwana* (see Figure 6) if we think of *kokwana-b* as being determined by *tatana* ('father') of *mamana* ('mother') = *kokwana-b* ('maternal grandfather'), with *kokwana* ('mother's brother') included in the covering term *kokwana* by virtue of *ñwana* ('son') of *kokwana-b* = *kokwana* (that is, *kokwana* as a covering term, includes all instances of *kokwana,* namely *kokwana-a, kokwana-b* and *kokwana*), then there is no genealogical oddity.
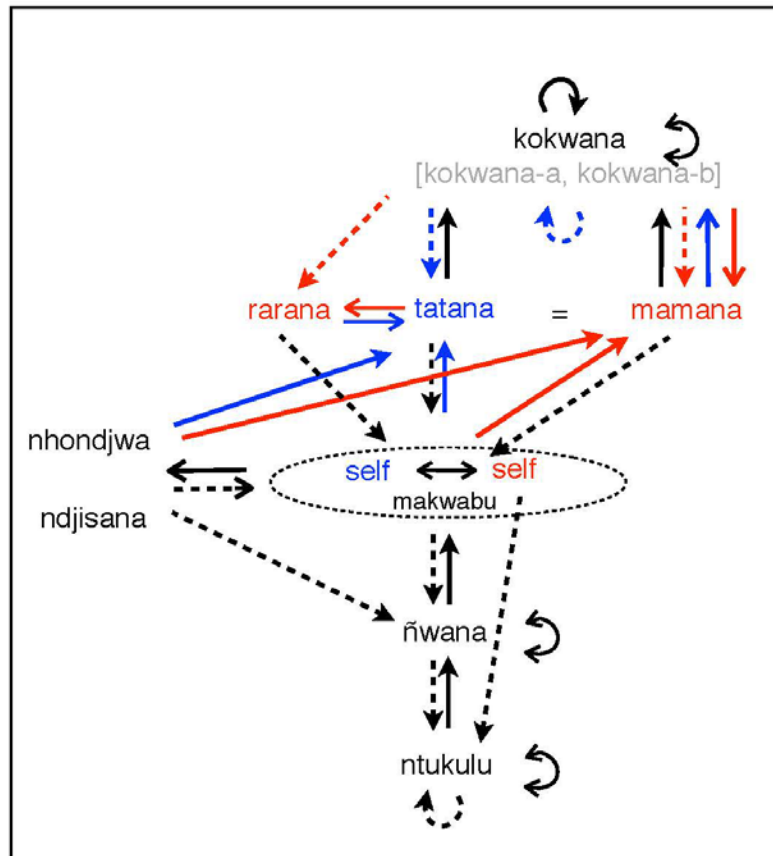
Figure 7: The term *kokwana* is introduced as a covering term for *kokwana*-a, *kokwana*-b and *kokwana*. The generated structure is isomorphic with the kin term map shown in Figure 1.

A key result provided by working out the logic of the Thonga terminology, is that what is called skewing, at least in this terminology, stems from a faulty premise. The term, skewing, presumes that the "correct" kinship structure is the genealogical grid, and these terminologies have overridden, for some reason, the generational aspect of the genealogical grid with respect to (in the case of the Omaha terminologies) certain male marked kin terms (or, in the case of the Crow

terminologies, certain female marked kin terms). However, as Lewis Henry Morgan (1871) realized, the classificatory terminologies are not structured solely in accordance with the structure of genealogical relations but are based, he suggested, on kinship ideas relating to marriage, the only other determiner of kinship relations according to his assumptions about kinship relations. This, however, was not successful, thus implying, as recognized by Emile Durkheim in his oft-quoted comment that a kinship relation "is a social tie or it is nothing" (1898: 318), that the kin relations expressed through the kin terms making up a kinship terminology must be grounded in some other aspect of kinship ideas other than just procreation or marriage. What has been shown here is that when we view the Thonga terminology from the perspective of kin term logic rather than the logic of genealogy (see Read 2007; Leaf and Read 2012), we find that the so-called skewing arises for a simple reason, namely only the male-marked terms arise through a generative logic that begins with male self, *tatana* ('father') and *nhondjwa* ('ascending brother') as primary, generating terms, whereas, in an asymmetric manner, the only generating term for the female marked terms is self.[xviii] This is the logic of a terminology that structurally only recognizes patrilines.[xix]

Consequently, the male marked terms have a lineal generational structure consisting of self, *tatana* ('father'), *tatana* ('father') of *tatana* ('father'), *tatana* ('father') of (*tatana* ['father'] of *tatana* ['father']), and so on, for ascending kin terms, and consisting of self, *ñwana* ('son'), *ñwana* ('son') of *ñwana* ('son'), *ñwana* ('son') of (*ñwana* ['son'] of *ñwana* ['son']) and so on, for the descending terms, whereas there is no lineal generational structure for the female kin terms since the sole female generating term is self and self is an identity element among female kin terms, so self of self = self, hence the product of self with itself does not generate a new kin term. Thus, what is referred to as skewing is actually, in the case of the Thonga terminology, the *absence of a generational structure*, not the collapsing of a generational structure introduced by overriding generation differences. The absence of structure means that female marked terms defined through products of self with male terms need not structurally preserve generation differences.

As discussed above, the absence of a generative structure for female terms indicates that the Thongan terminology excludes the mother relation as a primary generating concept. This implies that the structure of their terminology derives directly through kin term products involving *self*, *tatana*, *nhondjwa*, *self* and *nsati* and only indirectly from *manana* through the kin term product, *nsati* of *tatana* = *manana*. From this, it follows that rather than the kin term relation of the uterine nephew to his maternal uncle being determined through the consanguineal kin term product, *kokwana* ('opposite sex sibling') of *manana* ('mother'), it is given, instead, by the affinal kin term product, (*kokwana* ('opposite sex sibling') of *nsati* ('wife')) of *tatana* ('father'). Thus, the terminology replaces, as it were, the consanguineal link of a man to his maternal uncle beginning from his mother by an affinal link starting from his father, hence downplays the importance of *manana* in generating kinship relations. This downplaying of a consanguineal link is shown in a variety of ways through the behavior of the uterine nephew towards his maternal uncle. His relationship to his maternal uncle is not one of deference to a kinsman, expected especially with an older kinsman, but precisely the opposite: "The malume [mother's brother], indeed, for his uterine nephew, *is quite different from any other relative. No respect at all is necessary towards him*!") (p. 227, emphasis added) and "[t]he attitude of the ntukulu wa shisati (the uterine nephew)

to his malume *is quite peculiar*. 'Ntukulu i hosi, a nyenycla hikwapsu ku malume' — 'The uterine nephew is a chief! He takes any liberty he likes with his maternal uncle' (Mboza)" (p. 255, quote is from Junod's informant Mboza, emphasis added). In the death ritual for a man, his uterine nephew begins the ritual by taking on the role of being the emissary of the gods and then interrupts the ritual when he and his wives steal and then run away with, and eat, the ritual offerings of food and drink (pp. 161-162). A more dramatic expression of the rupture of a consanguineal connection between the uterine nephew and his maternal uncle would be hard to imagine. And in various religious rituals, the uterine nephew usurps the place of the maternal uncle.[xx]

Transformation from an Iroquois Terminology to an Omaha (or Crow) Terminology
The behavior of the uterine nephew towards his maternal uncle that Goody (1959) characterizes as "privileged aggression" (p. 62) is not unique to the Thonga-Ronga, as it occurs in other patrilineal societies such as the Tallensi (Fortes 1949) and the LoWiili of Northern Ghana (Goody 1959). Behavior like this is also reported in Sol Tax's (1937) account of the Fox Indians: "The mother's brother and his sister's children, on the one hand, and the father's sister and her brother's children … have what the Fox term a 'nonrespect' relationship" (p. 257). The Fox example is of particular interest since their terminology has a qualitatively different generative logic than does the Thonga terminology, even though both are considered to be Omaha terminologies. The difference can be seen in the fact that the equivalence rules used by Lounsbury (1964) to generate the genealogical categories corresponding to the Fox kin terms do not generate the genealogical categories for the Thonga-Ronga kin terms. This qualitative difference traces back to the fact that, as will be shown next, the Fox terminology, with its Omaha skewing, can be derived from an Iroquois terminology. Similarly, a Crow terminology can be derived from an Iroquois terminology.[xxi]

The Iroquois terminology, like other bifurcate merging terminologies, is based on a structure of male terms and an isomorphic structure of female terms, with the two structures joined to make a single, symmetric and complete terminology (see Leaf and Read 2012 for details). The transformation of the Iroquois into a Fox/Omaha (or Crow) terminology means that unlike the asymmetry of the Thonga terminology with respect to the structure of male terms in comparison to female terms, the Fox/Omaha terminology reflects the symmetry of the Iroquois terminology.

To show the transformation, the kin term map for the Seneca (Iroquois) terminology (man speaking) discussed by Morgan (1871) is shown in Figure 8A, but with the Seneca kin term names replaced by their equivalent Fox kin term names from Table 1 in Tax (1937), except there are no names for the two X-cousin positions due to the skewing in the Fox terminology. The generating terms for the kin term map shown in Figure 8A are listed in the box at the bottom of Figure 8.

Figure 8A shows the structure of the Seneca determined through these generating terms. Figure 8A can be interpreted as showing what the kin term map for the Fox terminology would look like, absent skewing, thus the transformation exemplifies Kronenfeld's (2009) suggestion that skewing can be seen as an overlay on a non-skewed terminology, at least for the Crow-Omaha terminologies formally described in Lounsbury (1964). It should be noted, though, that the overlay hypothesis is falsified by the Thonga and the Hokha Chin terminologies, or by any other

terminology that utilizes the generative logic of reducing female generating terms to the self term, such as the Hadza terminology.

The Iroquois pattern for an etically defined parallel-cross distinction among kin terms (see Trautmann and Whiteley 2012a:1-3) can be seen in the middle three generations of Figure 8A. In these three generations, the parallel kin terms consist of the left two columns of kin terms and the kin terms in the right two columns are the cross terms. In Figures 8B - 8D, only the arrows corresponding to the primary terms *negwi's^a* ('son') and *netane's^a* ('daughter') are shown (so as to make the diagrams simpler) since the transformation from the structure of a Seneca terminology to that of an Omaha (or Crow) terminology only involves changes in kin term products using these primary kin terms.

The structural position for the X-cousin terms can be removed by changing the definition of the kin term products that determine these two positions, namely by changing the kin term product, 'child' of 'mother's brother' = ['male X-cousin', 'female X-cousin']. This product can be redefined by setting the kin term product *negwi's^a* ('son') of *ne'ci'ä'^{a}* ('mother's brother') to be *ne'ci'ä'^{a}* ('mother's brother'), rather than 'male X-cousin' (see Figure 8B); that is, by introducing the structural equation:

(1) *negwi's^a* ('son') of *ne'ci'ä'^{a}* ('mother's brother') = *ne'ci'ä'^{a}* ('mother's brother').

Similarly, redefine the kin term product *netane's^a* ('daughter') of *ne'ci'ä'^{a}* ('mother's brother') to be [*negy^a, negi'^{ha}*] (['mother', mother's sister']), rather than 'female X-cousin' (see Figure 8B); that is, introduce the structural equation:

(2) *netane's^a* ('daughter') of *ne'ci'ä'^{a}* ('mother's brother') = [*negy^a, negi'^{ha}*] (['mother', mother's sister']).

As can be seen from Figure 8A, re-mapping *negwi's^a* ('son') of *ne'ci'ä'^{a}* ('mother's brother') to *ne'ci'ä'^{a}* ('mother's brother') and *netane's^a* ('daughter') of *ne'ci'ä'^{a}* ('mother's brother') to [*negy^a, negi'^{ha}*] (['mother', mother's sister']) are the only feasible ways to redefine these two cross products, yet staying within the structure of the Iroquois terminology.
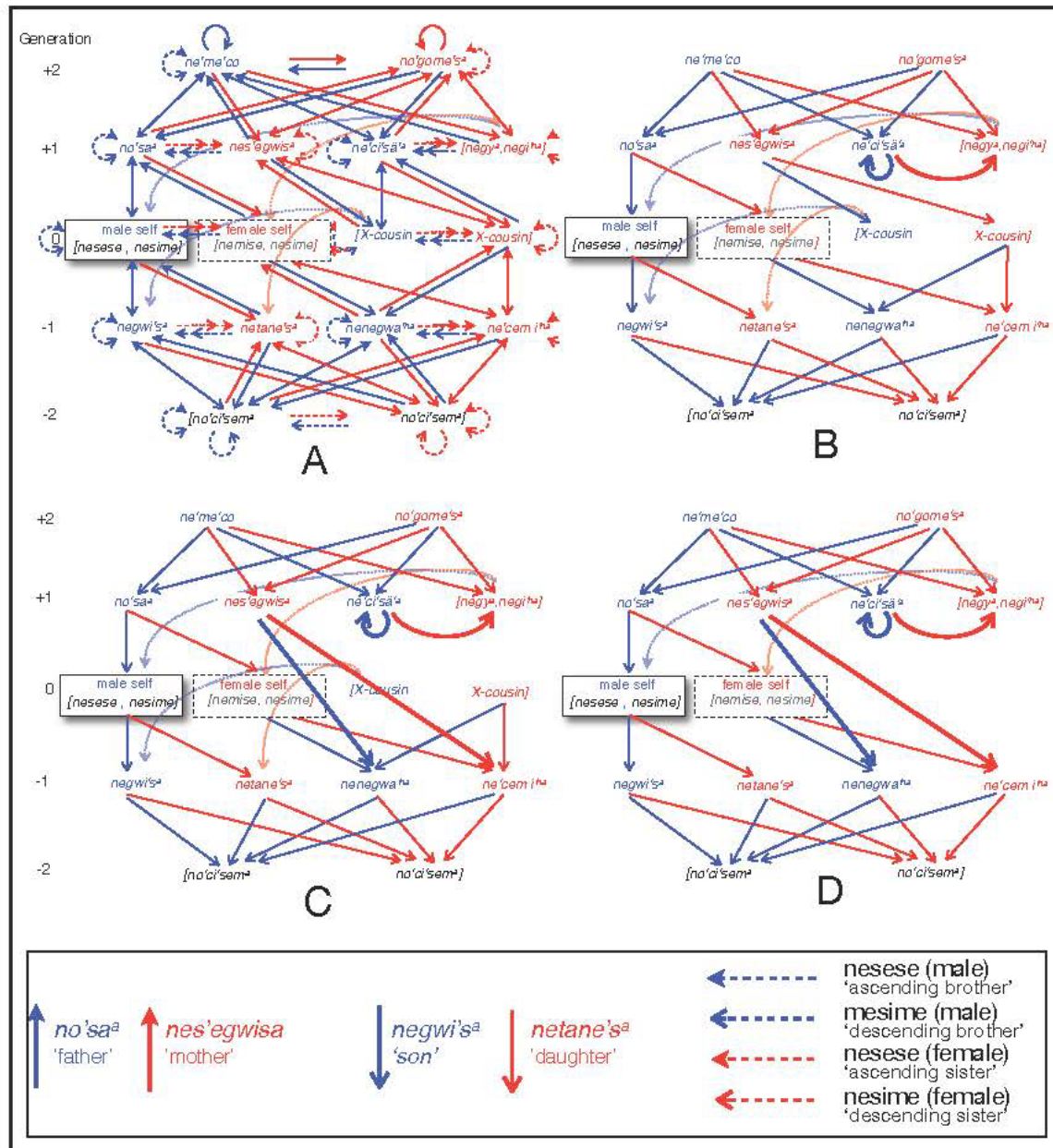
By reciprocity of kinship relations, we must also introduce the reciprocal structural equations for Equations (1) and (2):

(1*) *negwi's^a/netane's^a* ('son'/'daughter') of *nes'egwis^a* ('father's sister') man speaking = *nenegwa'^{ha}/ne'cem i'^{ha}* ('nephew'/'niece'),

and

(2*) *negwi's^a/netane's^a* ('son'/'daughter') of *nes'egwis^a* ('father's sister') woman speaking = *negwi's^a/netane's^a* ('son'/'daughter').

The effect of this last transformation is shown in Figure 8C. Lastly, we remove the male X-cousin and the female-X-cousin terms, along with the kin term products shown by the arrows that begin at the two X-cousin positions, since these terms are now at positions isolated from the generative logic of the terminology. This yields Figure 8D, which is the kin term map of the Fox terminology (male speaking). (Note that the equivalence rules for skewing introduced by Lounsbury are subsumed under structural equations (1) and (2) and their reciprocal equations, (1*) and (2*).)

Figure 8: (A) Kin term map for the Iroquois terminology (male speaking), using the Fox kin terms. (B) - (D) Only the 'son' and 'daughter' arrows are shown as these are the only arrows affected by the redefined kin term products. (B) The arrow from *ne'ci'sä'ᵃ* ('mother's brother') to *X-cousin* now points to *ne'ci'sä'ᵃ* ('mother's brother') and the arrow from *ne'ci'sä'ᵃ* to *X-cousin* now points to *[negyᵃ, negi'ʰᵃ]* ('mother', 'mother's sister'). (C) The arrow from *nes'egwisᵃ* ('father's sister') to *X-cousin* now points to *nenegwa'ʰᵃ* ('nephew') and the arrow from *nes'egwisᵃ* ('father's sister') to *X-cousin* now points to *necemi'ʰᵃ* ('niece'). (D) The X-cousin and the X-cousin terms, and the arrows beginning at these terms, have been removed. The reductions of other kin term products implied by the inclusion of these structural equations are not shown.

Alternatively, the Iroquois terminology can be transformed into a Crow terminology by redefining the kin term products of *negwi's^a* ('son') and *netane's^a* ('daughter') with *nes'egwis^a* ('father's sister').[xxii] Whether an Iroquois terminology was transformed (historically speaking) into a Crow versus an Omaha terminology would depend on other factors relating the terminology structure to the social system for which the terminology is a part.[xxiii]

The transformations discussed in the previous paragraphs answer affirmatively the question posed by Trautmann and Whiteley (2012b): "Might there be actual lability in Iroquois kinship that suggests it … [has] proximate Crow-Omaha potentialities?" (p. 291). However, Trautmann and Whiteley's proposal (p. 293) to include Dravidian terminologies and to form the evolutionary sequence Dravidian ↔ Iroquois ↔ Crow-Omaha is not justified from a structural perspective due to the structural implausibility of the proposed Dravidian ↔ Iroquois transition since the Iroquois terminology structure is a variant on the structure of the Kariera terminology (Leaf and Read 2012) and the Kariera terminology and the Dravidian terminologies have qualitatively different generative logics (Read 2010), so the Dravidian and the Iroquois terminologies also have qualitatively different generative logics (see Read 2013b for an example of the effect of structural constraints on evolutionary transformations, as it occurs in the Polynesian terminologies).

Whereas the Thonga terminology excludes a generative structure for female terms (other than the self position), the Fox terminology likely began with an Iroquois terminology, so it would initially have had symmetric structures for the male terms and the female terms prior to the removal of the cross-cousin positions. This contrasts sharply with the Thonga terminology, but nonetheless, both terminologies have the same skewing involving the 'mother's brother' kin term, namely 'mother's brother' = 'son' of 'mother's brother' = 'son' of 'son' of 'mother's brother', and so on. The underlying generative logic for the skewing of the Thonga terminology is one of reducing the structure of female terms to a minimum, which also makes the male structure central to generating the Thonga terminology. In contrast, the underlying generative logic for the skewing of the Fox terminology is one of removing the 'cross-cousin' kin terms from the terminology by redefining the kin term product 'son' of 'mother's brother' and 'daughter' of 'mother's brother' to be 'mother's brother' and 'mother', respectively, yet both terminologies have the same skewing pattern for the kin term 'mother's brother'

Structural Basis for Skewing

Although the Family Space is bilaterally defined, only one of the parent-child filial links in the Family Space is jurally recognized in a unilineal system for purposes of tracing descent. The filial link that is not jurally recognized has not, however, disappeared. To one degree or another the filial link of a child to its mother in a patrilineal society, or the filial link of a child to its father in a matrilineal society, can still be acted upon as social groupings, leading to what Fortes (1953) referred to as complementary filiation, thereby introducing tension between the bilateral basis of the Family Space and a unilineally defined descent group, as discussed by Goody (1959).

The Thonga terminology deals with this tension by reducing the non-jurally recognized filial link to a minimum in the generative logic of the terminology. The terminology has the most extreme form that it can have with regard to "erasing" that filial link, yet still remain a bilateral

system of kin term relations. The generative logic does this by excluding female relations of the Family Space (except the 'wife' relation) as generating elements, reducing their contribution to the generative logic to the sex difference that is part of these relations in the Family Space. Even here, sex marking is minimized by the use of neutral terms for all consanguineal kin terms except *ranana* ('father's sister') and *manana*. ('mother'). In this sense of minimizing the non-jurally recognized filial link, the Thonga terminology is the obverse image of the matrilineal Moso who, though having a father term as part of their kinship terminology, removed the father filial link by excluding marriage, at least for commoners (Shih 2010), hence there is no publicly recognized instantiation of the father kin term and so no public recognition of a man as a father, though males, as individuals, engage in male parenting.

With an Omaha terminology like the Fox terminology, the skewing arises, as discussed above, for a different reason. The skewing of an Omaha (or a Crow) terminology like the Fox terminology has been attributed to factors such as the "maturity" of a clan system (e.g., White 1939), the strength of a descent group as a corporate entity (e.g., Radcliffe-Brown 1941), the residence pattern (e.g., Murdock 1949, Titiev 1956), descent and inheritance (e.g., Lounsbury 1964, Kronenfeld 2009), cross-cousin marriage preference/prescription (e.g., Lane and Lane 1959, Eyde and Postal 1961, Moore 1963, Kryukov 1998), or marriage alliances (e.g., Lévi-Strauss 1949, McKinley 1971). There are counter examples for each of these arguments and the contexts in which Crow-Omaha terminologies occur argue against a single causative factor for the transformation from an Iroquois to an Omaha or a Crow terminology — or, alternatively, a more complex argument is needed that takes into account multiple causal factors. Another difficulty is that these arguments have attempted to formulate causal factors without first making it clear, from a kinship terminology viewpoint, what needs to be accounted for (Trautmann and Whiteley 2012a, b). As a first step, then, we need to consider the possibility that the transformation from an Iroquois to a Crow or Omaha terminology derives from structural issues inherent in the intersection of an Iroquois terminology with a unilineal descent system before considering external factors that correlate with the skewing of the Crow-Omaha terminologies.

A structural issue that can arise between an Iroquois terminology and a unilineal descent system stems from the lineages associated with the instantiation of the 0 generation kin term relations 'ascending brother'/'descending brother' and 'male cross cousin' for a male speaker (the same argument applies to a female speaker; I focus on the male sex only for convenience). The lineages are: speaker's father's lineage (call it lineage A), speaker's father's sister's husband's lineage (call it lineage B) and speaker's mother's/mother's brother's lineage (call it lineage C) (see Figure 8A). In a moiety system, as occurs with the Seneca, lineages B and C will be the same lineage and so it follows that speaker and speaker's brothers will be members of speaker's moiety and those referred to as 'male cross-cousin' by speaker will be members of the other moiety. Thus, for the 0 generation, the terminology distinguishes, as it were, between "own moiety" and "other moiety" from speaker's perspective. This pattern repeats in the same way for all males. Consequently, the intersection of an Iroquois terminology with a moiety system is consistent in that for a male speaker, speaker and speaker's brother are in speaker's moiety and all 'male cross cousins' of speaker are in the other moiety. In the language of cross and parallel, there is an

opposition between parallel and cross relations in the 0 generation. However, this is not the case in societies such as the Fox Indians where there are multiple lineages.

With multiple lineages, lineages B and C need not be in same lineage and so the males who make up the instantiation of the kin term 'male cross-cousin' may be distributed across both lineage B and lineage C, or possibly even another lineage. Further, the two lineages, B and C, need not be same for all males, even for males in the same lineage. This implies that the intersection between the lineage system and the kinship terminology system is no longer consistent, independent of the reference person, but is contingent upon prior decisions regarding lineage exogamous marriages. This inconsistency between an Iroquois terminology and a lineage system with multiple lineages can be resolved by the transformation from an Iroquois terminology to a Crow or an Omaha terminology, but it may be resolved by other means as well, or it may remain unresolved, or only partially resolved, depending on non-terminological criteria. Unlike the sequence of steps involved in the generation of a terminology, the logic of a transformation from an Iroquois to a Crow or an Omaha terminology through deleting 'cross-cousin' kin terms only refers to the form of the transformation, not whether a transformation will occur. The latter refers to the fact that the inconsistency occurring in the intersection of an Iroquois terminology with a lineal system is a "push" for change, not the introduction of a logical requirement, and so leads to quantitative, statistical patterning reflecting the relative importance of other, contingent factors, rather than to re-occurring qualitative differences that repeat under the same conditions.

Conclusion

The answer to the primary question addressed here, namely whether the skewing characterizing the Crow-Omaha terminologies is part of the generative logic of a kinship terminology, has been found to have different answers, at least for the Omaha terminologies, due to the discovery that there is more than a single generative logic for the Omaha terminologies. Consequently, there is no single way that skewing arises, and instead skewing may arise either as a direct logical consequence of the generative logic of the terminology or as a transformation of a kinship terminology. More precisely, terminologies like the Thonga terminology of South Africa and the Hokha Chin terminology of Burma, both with a generative logic based asymmetrically on a structure of male terms and a structure of female terms reduced to the singe term self, have skewing as part of the generative logic of the terminology. However, as the Hadza terminology demonstrates, the skewing need not match the definition of an Omaha terminology in which the structural equation 'son' of 'mother's brother' = 'mother's brother' is valid. In contrast, the skewing of the Crow-Omaha terminologies, describable through the equivalence rules presented in Lounsbury (1964), is added on to a kinship terminology, as indicated by the fact that even absent the skewing equivalence rule the remaining equivalence rules still describe a kinship terminology. This variation among terminologies with regard to the reasons for skewing to be part of the terminology indicates that skewing, *per se*, is not the primary kinship idea characterizing terminologies with skewing. For the Thonga terminology, the underlying kinship idea seems to be that of minimizing the bilaterality of the Family Space by excluding the mother relation as a primary relation for generating the kinship terminology and instead introducing the mother relation through the kin term product *nsati* ('wife') of *tatana* ('father') = *manana* ('mother'),[xxiv] whereas

an underlying kinship idea for the Fox terminology appears to be the elimination of an inconsistency in the intersection of an Iroquois terminology with a unilineal system that is not a moiety system. Thus, we need to determine what constitutes the corpus of kinship ideas underlying skewing in a terminology by first taking into account the generative logic underlying that terminology and how this relates to the skewing found in the terminology.

In their edited book, *Crow Omaha: A New Light on an Old Subject*, that resulted from the Amerind Foundation Advanced Seminar held in 2010, the seminar organizers, Thomas Trautmann and Peter Whiteley (2012a), contrast a descent approach as a way to account for the skewing in Crow-Omaha terminologies — an approach that largely considers skewing to be an intra-society property — that traces back to Morgan (1871) and Kohler (1897), with an alliance approach that traces back to Lévi-Strauss (1949) and considers skewing to largely be an inter-society property. The latter, they point out, leads to a further division between Crow-Omaha societies with asymmetrical prescriptive cross-cousin marriage, on the one hand, and semi-complex marriage structures determined through marriage prohibition rather than marriage prescription, on the other hand. The fact that skewing cross-cuts all of these societal divisions indicates that none is the causal basis for skewing. Part of the difficulty is the fact that, as has been shown here, skewing is not a unitary property, but a labeling that identifies the outcome of different causal processes that can lead to the same form of skewing, as shown by the Thonga and the Fox terminologies since both have the form of skewing associated with Omaha terminologies but through different causal processes, and the same causal process can lead to different forms of skewing, as shown by the Thonga and the Hadza terminologies with the same asymmetric difference between male and female generating terms but different skewing patterns. Further, how skewing relates to other social dimensions such as marriage systems need not be the same when the skewing is a logical consequence of the generative logic of a terminology (e.g., the Thonga terminology), as when it is added on in the sense that the generative logic would give rise to a kinship terminology even absent the skewing (e.g., the Fox, the Trobriand and the Fanti terminologies). When the skewing does not derive from the generative logic of the terminology, then its relationship to other, non-terminological factors, needs to be worked out in detail. Asymmetric prescriptive cross-cousin marriage, for example, can eliminate the inconsistency that arises in the intersection of an Iroquois terminology with a multi-lineal form of social organization as discussed above, but there still remains the question of which is the cause and which is the consequence: the skewing or the asymmetric marriage — or neither.

Part of the analytical complexity regarding what are referred to as Crow-Omaha systems is that for those societies where the skewing does not arise as part of the generative logic of a terminology, but instead involves a redefinition of kin term products such as 'son' of 'mother's brother' or 'daughter' of 'father's sister' that, without redefinition, would lead to a non-skewed terminology, we need to consider the context that provides the push for redefinition. In this sense, accounts of the Crow-Omaha terminologies that fit within Lounsbury's formalism, hence where the skewing is introduced into a terminology and is not part of its generative logic, cannot just be accounts about terminologies, but rather need to be accounts that engage with "systems of social categories … of *social activity*, social processes … [that] produce … social groupings" (Turner 2012, seminar remarks, emphasis in the original). This does not mean that the terminologies

involved, *per se*, are not of interest, for the transformation of an Iroquois terminology to a Crow-Omaha terminology may not have the same implications for the social activity and social processes that are involved as does a transformation of a Kariera terminology (McConvell and Hendery 2017), or some other terminology, such as the Fanti unskewed Cheyenne terminology (Kronenfeld 2009), to a Crow-Omaha terminology. For all of these modalities, we need to begin with the generative logic of the terminology and work out how that logic plays itself out with respect to the kinship system for which the terminology is a part.

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[i] By "all 'siblings'," Lounsbury is referring to the genealogical referents of the six sibling terms in the Fox kinship terminology: *neto'tam^a* ('same sex sibling'), *nete'gwam^a* ('sister, man speaking'), *netawana* ('brother, woman speaking'), *nesese* ('older same sex sibling'), *nemise* (older opposite sex sibling'), and *nesime* ('younger sibling') (from Table 1 in Tax 1937).

[ii] By a *kin term product* (see Read 1984) is meant the calculation culture bearers make to determine kin term relations directly from kin terms. If speaker A (properly) refers to person B by the kin term L, and person B (properly) refers to person C by the kin term K, then the kin term product of the kin terms, K and L is the kin term, M (if any), that speaker (properly) uses to refer to person C. An English speaker, for example, knows that if he or she refers to B by the kin term *aunt*, B refers to C by the kin term *daughter*, then speaker, based on her/his cultural knowledge regarding the English/American kinship terminology, knows to refer to person C by the kin term *cousin*. Numerous ethnographers (see references in Read 2018) have commented on, and documented, that culture bearers typically compute kin term relations using kin term products — a computation that neither requires knowing the genealogical category associated with a kin term nor the genealogical connections among the persons involved, if any (e.g., one of

the persons may be adopted). The kin term product is not the same as the etically defined *relative product* used to connect one genealogical relation to another through concatenation, such as the relative product of M and BD is MBD.

[iii] The term *self* is used as the expression speaker uses to refer to oneself, as in the English expression "myself." The term self will be sex marked when the sex of speaker is also being denoted. Thus, a female speaker refers to herself by a female marked self term and a male speaker refers to himself by a male marked self term when the sex of speaker is being denoted. A female/male marked self term cannot (validly) be used by a male/female speaker to refer to oneself. If speaker (validly) refers to alter A by the term self, then alter A must be speaker. If alter A (validly) refers to alter B by the term self, then alter B must be alter A. The self term is an identity element for the kin term product, for if speaker refers to alter A by the term self and alter A refers to alter B by any kin term K, then speaker refers to alter B by the kin term product, K o self. Since speaker is alter A due to speaker referring to alter A by the term self, and since alter A refers to alter B by the kin term K, it follows that speaker also refers to alter B by the kin term K, and so K o self = K. By a similar argument, self o K = K and so self is an identity element for kin term products. A sex marked self term will only be the identity element for kin terms with the same sex marking (including neutral terms) as the self term.

[iv] Kin terms, English and foreign, will be given in italics. Foreign kin terms will often be followed by an English translation of the kin term in single quotes.

[v] Here, and below, blue font will be used for male terms, red font for female terms, and black font for neutral terms.

[vi] The first two of these three statements, it should be noted, expand on statements in previous publications (Read 2007; Leaf and Read 2012) indicating that classificatory terminologies have a core structure based on a core structure of male terms and an isomorphic core structure of female terms, thus making the core structure of male terms symmetric with the core structure of female terms. These previous statements were not intended to be definitive, but to express the range of variation in the genealogical structure of kinship terminologies analyzed up to the date of those publications (see terminologies included in Read 2016). As the generative logic of more terminologies is worked out, we can expect other possibilities for the generative logic of kinship terminologies to be identified.

[vii] The kin term product of self with a male marked kin term, K, yields the expression self o K. The kin term K indicates that speaker refers to alter A by the kin term K. The expression self o K will be the kin term that speaker uses to refer to alter B. In this expression, the term self indicates that alter A refers to alter B by the term self, thus the expression self specifies that alter A is alter B for this expression to be valid. Hence the kin term relation K (i.e., the kin term relation without sex marking) that speaker has to alter A will be the kin term relation that speaker has to alter B since the expression self specifies that alter B is alter A. Since self is "female self," it follows that B is female and so the expression self o K has interpretation as the female marked form of the kin term relation K that speaker will use to refer to alter B. So, the kin term product of self with a male marked kin term formally transforms a male marked kin term into a female marked form of that kin term. Consequently, kin term products of self with male marked kin terms transforms male marked kin terms into female marked kin terms. Similarly, kin term products of self with female marked kin terms transforms female marked kin terms into male marked kin terms. This procedure of taking products with a sex marked form of the self term determines another way, in addition to the two procedures discussed in Read 2007 and Leaf and Read 2012, by which female (male) sex marked kin terms can be introduced into a kinship terminology from male (female) marked kin terms through the generative logic for that kinship terminology.

[viii] Radcliffe-Brown incorrectly states, as part of claiming unity of the mother's lineage, that "the female members of a man's mother's lineage in her own and succeeding generations are his 'mothers'" (1950:35). Radcliffe-Brown references Junod (1913) on the Shangana-Tonga tribes as the source for this observation, but Junod lists *kokwana* for mother's mother. The lineage principle being used by the Shangana-Tonga is that of a conceptual boundary expressed by the term *kokwana* for the kinship terminology space consisting of all relations ancestral to *tatana* ('father') or *manana* ('mother'), as discussed above. In this sense, it is like *cousin* in English being a kin term that is the conceptual boundary for kin relations beyond *brother*/*sister* of *grandparent,* of *great grandparent, ...,* or of their reciprocals.

[ix] In the Chin terminology, we find the same terminology structure (Read nd), but with a few differences. One is that the Chin terminology has separate terms for the boundary of the lineages of speaker's father and of speaker's mother, which reinforces the interpretation that *kokwana* is a covering term in the Thonga terminology providing the boundary for the lineages of speaker's father and of speaker's mother.

[x] Because self is generally not considered to be a kin term, we will write "product with self" rather than "kin term product with self."

[xi] The extent to which this generalizes to other terminologies where the term for father's sister means 'female father' still needs to be determined.

[xii] The gloss of *nhondjwa* being used here is 'ascending brother', not 'elder brother', as *nhondjwa* is a generating term for the ascending structure. In addition, age is not the unique defining distinction between *nhondjwa* and *ndjisana* since the sons of a first wife have the status of *nhondjwa* with respect to the sons of co-wives regardless of their relative ages (Junod 2013: 224) and the sons of father's *nhondjwa* are *nhondjwa* and the sons of father's *ndjisana* are *ndjisana*, regardless of actual age (a pattern that is also found with the Tongan kinship terminology [Biersack 1982]) and the husband of a man's wife's sister is *nhondjwa* or *ndjisana* to that man according to whether the sister is *nhondjwa* or *ndjisana* with respect to the wife's sister (Jacques 1927: 339).

[xiii] There is no logical necessity for the Thonga-Ronga pattern of a covering term for self and self, with self and self unnamed. In the Fox terminology, self is labelled by the kin term *netaqwan[a]* ('brother, woman speaking') and self is labelled by the kin term *nete'gwam[a]* ('sister, man speaking').

[xiv] What is being described here is the logic by which a male and a female marked term are replaced by a neutral term in the Thonga terminology, not a general property of kinship terminologies.

[xv] Shapiro (2016) uses Junod's (1913) account of 'great father' and 'little father' to support his argument that terms like *tatana* and *mamana* do not determine equivalence classes of mutually substitutable individuals, but instead are grounded in procreation, hence F and M are their focal types, respectively. He expresses disappointment in Junod's not mentioning 'great mother' or 'little mother' as part of Thonga-Ronga kinship ideas. Given the thoroughness of Junod's ethnography, lack of mention most likely means absence, not oversight. Further, Shapiro does not mention Junod's repeated reference to 'great wife' and 'little wife' as part of Thonga-Ronga kinship ideas. These two expressions suggest that 'great' and 'little', rather than linking the terms to which they apply to procreation as argued by Shapiro, instead identify *tatana* and *nsati* as primary concepts in Thonga-Ronga kinship ideas and link the terminology to the parent and the spouse dimensions, respectively, of the Family Space concept (Read, Fischer and Chit Hlaing 2014) that provides the conceptual grounding for systems of kinship relations, whether genealogical relations or kin term relations (Read 2018). Further, the reduction of female generating terms to self is the antithesis of recognizing female procreation. This, interpretation, however, does not deny Shapiro's argument regarding the centrality of procreation in kinship systems since the concept of a Family Space (see Read, Fischer and Chit Hlaing 2014, Read 2018) is a widespread if not universal, idea, but instead underscores the limitation of reductionist approaches to understanding kinship systems. Kinship systems are multidimensional and interface with all aspects of human social systems, hence are an amalgam of multiple idea systems (Leaf and Read 2012) and the interplay among these idea systems needs to be made explicit, not eliminated through reductionist accounts.

[xvi] Consider also the following example Junod provides from his genealogical data: "So we find this strange fact: Maphunga, the mother of Shaputa is a wife for Miksaben and Muhambi, while her daughter, Shaputa, is a mother for them!" (1913: 229). Maphunga is Miksaben's mother's brother's wife, hence Miksaben refers to Maphunga as *nsati* ('wife') (see Table 1), and Shaputa is Miksaben's father's wife's brother's daughter, hence Shaputa is a potential wife for Miksaben's father and so Shaputa refers to Miksaben as *ñwana* ('son') and Miksaben reciprocally refers to Shaputa as *mamana* ('mother'). Muhambi is another male cousin, but not part of the fact that the mother of Shaputa is referred to as 'wife' by Miksaben and her daughter, Shaputa, is referred to as 'mother'. This example contradicts the

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implications of the kin term *mamana* if conceived primarily from a procreation viewpoint, but is consistent with the kin term product definition of *mamana*: *nsati* of *tatana* = *mamana*.

[xvii] This does not imply the irrelevance of procreation, but instead identifies the centrality of male procreation, as opposed to female procreation, in the structure and organization of Thonga-Ronga kinship relations generated through primary male terms.

[xviii] Skewing is not universally generated in this manner. The Trobriand terminology (Lounsbury 1965; Read and Behrens 1990), the Fanti terminology (Kronenfeld 2009), and terminologies from Australia (McConvell 2012), are cases of terminologies for which skewing appears to be added to a kinship terminology structure, hence are examples of cultural modification of a kinship terminology. In both cases, there is a structure of male marked terms and a structure of female marked terms joined together to form a single structure of kinship terms and in both cases the terminology without the skewing is a logically consistent terminology. Kronenfeld makes it explicit that the Fanti recognize, and make use of, both the skewed and the non-skewed versions of their terminology, though they consider the skewed version less "natural." However, in the Thonga terminology the skewing is the consequence of the absence of a set of generating kin terms for female marked terms and so is not a property added to an underlying terminology.

[xix] In this regard and according to David Webster (1986), in the 18th century and through the early 19th century, the Thonga were a powerful polity with strongly developed lineages, consistent with the Omaha terminology recorded for the Thonga by Junod at the beginning of the 20th century. By the mid-18th century, the Zulu had become a major polity in Africa and, along with adoption of the Zulu language, Zulu ethnicity began to be seen as being advantageous, including a shift from the Thonga terminology with its Omaha structure to the Zulu kinship terminology that has the structure of an Iroquois terminology. This shift in terminology structure is consistent, Webster argues, with the loss of the importance of lineages among the Thonga, so that today there are, at most what he refers to as "clan fragments" (p. 629) and "extreme nucleation" (p. 629) in place of "kin-based residential patterns" (p. 629).

[xx] As a way of explaining the occurrence of ritualized aggression in patrilineal societies with Omaha terminologies, Bloch and Sperber (2002) consider that "the out-of-the-ordinary character of a sister's son's rights over his mother's brother's goods … contribute to highlighting the normal character of patrilineal transmission of goods … [and] renders people receptive and welcoming to a norm of ritualized expression of sister's-son rights" (p. 734-735) even though sister's son's rights run counter to patrilineal transmission. However, their argument falters by making a universalistic argument even though ritualized aggression by sister's son us is only associated with patrilineal societies that have an Omaha terminology.

[xxi] More precisely, the Fox terminology can be derived from a Dakota terminology, given the convention that patrilineal societies with Dakota-Iroquois terminologies are said to have a Dakota terminology, while matrilineal societies with Dakota-Iroquois terminologies are said to have an Iroquois terminology (White 1939). For simplicity, reference will be made here just to Iroquois terminologies and the Dakota-Iroquois distinction will be left implicit. White (1939) argued that the terminology for a society with a Dakota-Iroquois terminology and a strong family unit but a weak concept of clans evolved into an Omaha or a Crow terminology, respectively, as the concept of clans evolved, but did not delineate how the transformation would take place, or precisely what was meant by weak or strong concepts of clans.

[xxii] To see this, redefine the kin term product *negwi's*[a] ('son') of *nes'egwis*[a] ('father's sister') to be *no''s*[a] ('father'), rather than 'male X-cousin' , and the kin term product *netane's*[a] ('daughter') of *nes'egwis*[a] ('father's sister') to be *nes'egwis*[a] ('father's sister'), rather than 'female X-cousin', include the reciprocal of these redefined kin term product equations and then delete the male X-cousin and the female X-cousin terms since these are now isolated from the kinship terminology structure.

[xxiii] The transformation to a Crow or an Omaha terminology need not begin with an Iroquois terminology. A similar transformation applies to a Kariera-like terminology (McConvell 2012), and possibly to other terminologies.

Consequently, what is said here about the transformation of an Iroquois terminology to a Crow-Omaha terminology applies to these other terminologies as well.

[xxiv] Unanswered here is the antiquity of the generative logic shown here for the Thonga terminology and the social context in which it was introduced, possibly as a terminology replacing an earlier terminology since the generative logic of the Thonga terminology is not derivable as a transformation of a previous terminology through the addition of structural equations that determine the skewing of the terminology. The method of linguistic reconstruction (see McConvell 2016) could be used to track whether the Thonga terminology was introduced in the context of social changes, including changes in the organization of marriage.