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**Analytical Review of
*Types of Kinship Terminological Systems
and How to Analyze Them:
New Insights from the Application of
Sydney H. Gould's Analytic System*
by David B. Kronenfeld (2022: Brill Publishers)**

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22 years after the edition of Gould's *New System for the Formal Analysis of Kinship* (2000), Kronenfeld gives us *Types of Kinship Terminological Systems and How to Analyze Them: New Insights from the Application of Sydney H. Gould Analytic System* (Brill, Leyden/Boston, 2022). This essay aims at presenting and explaining « the whole Gould's system for the analysis of kinship terminologies in a clear enough and orderly enough way for even a non-kinship-specialist to not only understand it but also to easily use it. » but also « try to move beyond Gould's system. »

Despite the ruthless comments made by Scheffler (2002) in his review of Gould (2000), the author maintains that Gould's system of analysis is « far better than any other system in competition: logical and strongly predictive and deductive. » This is what his dense, rich and sometimes redundant essay, including an impressive array of graphs, diagrams and tables of kintype reductions attempts to demonstrate in a comparative perspective. But this is not the only goal that the book sets itself to achieve. Kronenfeld argues, notably in the *Overview* (part 8), that Gould's system opens up on a « new research agenda » pointing to « empirical regularities » that the formal analysis reveals and what accounts for them. Ultimately, one of the key issues addressed by the essay is about « the nature and role of distributed cognitive systems. »

If we set aside the *Preface* and the *Introduction*, the book subdivides in an uneven manner between the explanation and illustration of Gould's analytic method, consisting of 7 parts and a more speculative section (part 8) and the conclusion. More precisely, Kronenfeld first introduces us to the changes that Gould felt were necessary to give a stronger logical and mathematical basis to kinship formal analysis and then unfolds a complete analysis of the kinship terminology of the Fanti of Ghana on which the author conducted extensive research. and who speak a language belonging to the Akan family. The last part relates to Gould's system both in terms of its achievements and insights and the issues it may help address in the future.

From the outset, Kronenfeld insists that Gould's approach resolutely places itself in an etic (and thus comparative) perspective, which he defines more precisely (pp. 35-36) arguing that comparison among kinship terminology structures is only possible when using the same set of analytic categories brought by the analyst. It is alleged that emic approaches, based on calculations of kinship relationships from kin terms used by the native speakers themselves do not present the kind of generality necessary to achieve comparative goals,

Gould's analytic scheme stands in the tradition of the formal analytic approaches of kinship terminologies best represented by the Goodenough and Lounsbury paradigms, but is considered by Kronenfeld to be an improvement in terms of mathematical consistency, parsimony, sufficiency, applicability, and being less dependent on restriction contexts when compared to the rewrite rules approach.

When comparing different notational systems for representing kintypes, Kronenfeld argues that Gould's new system shows a considerable reduction of complexity (pp. 19-21) by using a limited set of symbols for parental kintypes: P (M, F), J for sibling, I for self and a few other symbols like sex of ego or alter (μ male vs ϕ female) etc., allegedly facilitating calculation and reduction of relevant kintypes. Gould also introduced a new transcription for parent reciprocals; i.e., *woman's child* and *man's child*, using the same set of parental symbols but written with an overbar: \bar{P} (\bar{F} and \bar{M}), with the latter two read as fatherling and motherling (two compounds formed from the parent's terms and the diminutive suffix -ling). *Grandparent* and *Grandchild* superclasses of Dravidian terminologies which involve a parallel and cross division, provide a good example for the use of reciprocals. My feeling though, is that Gould's transcription of this division, i.e., $FF \leftrightarrow MM$ with reciprocals $\bar{M}\bar{M} \leftrightarrow \bar{F}\bar{F}$ vs $FM \leftrightarrow MF$ with reciprocals $\bar{M}\bar{F} \leftrightarrow \bar{F}\bar{M}$, requires more guidance for the reader to be able to handle it easily. The same applies to the reciprocals of $MJ\mu$ (MB) or $FJ\phi$ (FZ) in a classificatory context – located in the 'nephew' and 'niece' category – thus respectively $\mu J\bar{M}$ (♂ZCh) and $\phi J\bar{F}$ (♀BCh).

An example of the logical power of Gould's notational system is how writing MB as $MJ\mu$ in a classificatory terminology helps define $MJ\mu$ as a male member of the *Mother* superclass. By application of the general classificatory equivalence $J \leftrightarrow I$, it follows that $MJ \leftrightarrow MI \leftrightarrow M$, $MJ\mu$ is then reduced to $M\mu$ which can be read as 'mother male.' $MJ\mu$ reduced to $M\mu$ contrasts with $MJ\phi$ (MZ) reduced to $M\phi$, denoting a female member of the *Mother* superclass. Furthermore, Kronenfeld asserts (p. 14) that mostly « by virtue » of this improved notational scheme, Crow-type diagnostic equivalences, notably, $M\bar{F} \leftrightarrow \bar{F}$ (MBC \leftrightarrow ♂C), and its reciprocal $F\bar{M} \leftrightarrow F$ (FZC \leftrightarrow F) – Omaha as well – are "more widely applicable and less tied to specific context" than Lounsbury's forms are.

Kronenfeld then clarifies the distinction among four kinds of equality between pairs of entities written using different symbols. The first one, also named full equivalence, is between pairs of kintypes and written as $X \leftrightarrow Y$, meaning that both expressions are structurally equivalent in the sense that the two kintypes correspond to one kinterm (and so are terminologically equivalent). At this point, Kronenfeld uncovers a key concept of kinship analysis relevant to the mathematical structure of terminologies and allowing reduction of kintypes: *substitutability*, meaning that one side of the equation can be substituted for by the other side during operations on kintypes. The second equivalence, written $X \approx Y$, signals an apparent structural anomaly, i.e., two kintypes are « concurrent » for one kinterm in a kin terminology where they ought not to be. Thus, in the Fanti kinship terminology, father's sister is referred to as *na* 'mother', a term which also covers mother's sister, while father and father's brother are des-

ignated as *egya* 'father' and mother's brother as *wofa* 'maternal uncle' in a classificatory manner. The third kind of equality is used for definitional purposes, and implies that a primary kintype or a relative product of primary kintypes defines one kin term, like in English a mother's brother is an *uncle* (written as MB = *uncle*). The fourth equality, written as \rightarrow , signifies a kintype being reduced or expanded into another one, such as MMZ \rightarrow MM in a classificatory terminology. Note that, Kronenfeld, and Gould, by deduction, follow Morgan on the definition of descriptive versus classificatory terminologies.

Kin graphs certainly represent one of the highest achievements of Gould's analysis. They draw the structure of a given kinship terminology by means of « boxes » or superclasses, distinguished by Kronenfeld (p. 31) as « sets of structurally *equivalent* kintypes (and, normally the kinterms they make up). » The boxes reduce these sets to the prototypic kintype determining the kinterm representing the class, written by starting with a capital letter, thus the *Parent* superclass in English. This *Parent* superclass or box is subdivided into *father* and *mother*, written inside the box subdivisions, to account for their gender. In this case, gender is the defining feature that distinguishes the in-box kin terms. Boxes within kin graphs are arranged generationally and, according to the equivalences specific to the system represented, possibly displaying a parallel vs cross division and the father vs mother side of the kintypes. Thus, the kin graph for a Dravidian-type system delineates systematic parallel/cross division, alliance relations between same-generation boxes, and brother/sister box pairs. The *Father* and *Mother* superclasses are, respectively, positioned on the paternal (left) and maternal (right) side of the graph, bringing together kintypes where father or mother are the links between self and another kintype; thus, FB and FZ for the *Father* superclass and MB and MZ for the *Mother* superclass. I have already mentioned how the notational reduction of $MJ\mu \rightarrow M\mu$ symbolizes the identification of the *maternal uncle* to a *male mother*. Furthermore, Dravidian-type kin graphs, like the one for Nanjilnattu Vellalar, a Tamil community (Fig. 4.4), show how the *Mother* and *Father* (*amma* and *appa*) superclasses (boxes) which also respectively include the 'maternal uncle' (*maman*) and the 'paternal aunt' (*attai*) have common reciprocals; i.e., 'son' (*makan*) and 'daughter' (*makal*) as well as 'nephew' (*marumakan*) and 'niece' (*marumakal*), the two latter terms being derived from the two former. The *Man's child* (\bar{F}) and *Woman's child* (\bar{M}) boxes (superclasses) both include these four terms.

Each box within a kin graph is labeled on its side according to the focal (prototypic) position of the term defining the class. In English, the genealogical label P is positioned on the side of the *Parent* box. The parent/child relationships among boxes (superclasses) are represented by lines symbolizing parent (mother and father) and child (motherling and fatherling) relations. Starting from the self/sibling position, the reader can then visually generate any kintype on the kin graph and thereby determine its corresponding kin term category. Taking again the kin graph of the Nanjilnattu Vellalar, one will follow the mother's line up to MM and the motherling line down and determine that $MMJ\bar{M}\phi$ (MMZD) is *periyamma* or *cinnamma*, respectively, glossed as 'elder maternal aunt' and 'younger maternal aunt.' Another property of kin graphs is to highlight in which superclass a « concurrence » is positioned. The kin graph of Fanti shows that, while falling in the 'mother' category, *na*, father's sister belongs to the *Father* superclass as explained by Kronenfeld (p. 150).

Kronenfeld refers to the topic discussed in Read (2000) concerning the similarity between the American English kin graph established genealogically and Read's kinterm map. Read writes : « this is not coincidental but stems from the relationship between the structure

of a kinship terminology and the genealogical tracing produced via a genealogical instantiation of the generating terms for the structure descriptively expressed as a kinterm map. »

Componential and relative products approaches and their outcomes are compared in Section 5, *Analysis*. The componential analysis is based on defining features making the kintypes of one kin term contrast with the kintypes for another. Tables are displayed comparing different versions of this method. Kronenfeld observes how an etic componential analysis fails to parcimoniously account for kinship terminologies and points out tautological aspects in the determination of what constitutes a defining feature. As for the « relative product approach, » my understanding of Kronenfeld's explanations of Gould's version is as follows: there are 2 ways in which relative products, may be employed. The first involves kintype definitions of kin terms, written with the equal sign, such as 'my father's brother is my *uncle*.' (FB = uncle). This is the way in which most semantic extensions of kinterms are formulated and what the (emic) Cayley tables given by Kronenfeld reflect. The second is when relative products are conceptualized as the basis of structural equivalence between kintypes, like $MJ\phi (MZ) \leftrightarrow MMJM\phi (MMZD)$ in a classificatory terminology. This equivalence mode is the very foundation for reducing extended kintypes to shorter or focal kintypes using the principle of *substitutability*. The kintype product, $MMJM\phi$, can be reduced to M by means of general classificatory equivalences

$$I \leftrightarrow J \leftrightarrow MM\bar{M},$$

by successively substituting I (self) to J, then I to $MM\bar{M}$, thus

$$MMJM\phi \rightarrow MM(I)\bar{M}\phi \rightarrow MI\phi \rightarrow M\phi \text{ (female mother)} \rightarrow M.$$

The reader will regret that almost no reference to Lounsbury's formal analysis is made in this section. Yet, his approach as well as Gould's approach are based on relative products and the reduction of range of referents to focal kintype by means of rewrite rules for the former, and terminology-diagnostic equivalences for the latter. Earlier in the text, Kronenfeld claimed that Lounsbury used a less general set of equivalences to reduce kintypes than Gould, and that Gould's general classificatory equivalences $I \leftrightarrow J \leftrightarrow MM\bar{M} \leftrightarrow F\bar{F}$ accomplish the same task as the half-sibling and merging rules but in a more general manner.

Crow and Omaha-type terminologies is another territory where Gould makes his mark, for he layed down, other than the general classificatory equivalences, only one set of equivalences to account for skewed relations for each generic system, thereby treating Lounsbury's skewing rules that account for subtypes extensions as « concurrences. » The Crow-type system – the only one I will consider here – is thus simply accounted by $M\bar{F} \leftrightarrow \bar{F}$ with reciprocal $F\bar{M} \leftrightarrow F$, while the Crow-type II skewing rules, originally written as $MB \rightarrow (e)B$ with reciprocals $\hat{\sigma}Ss \rightarrow \hat{\sigma}(y)B$; $\hat{\sigma}Sd \rightarrow \hat{\sigma}(y)S$, are rewritten as « concurrences »: $M\mu \approx eJ\mu$ with reciprocals $\mu\bar{M}\mu \approx y\mu J$; $\mu\bar{M}\phi \approx y\phi J$. This way of handling kintypes certainly contributed to Schefler's reaction. All of this needs a broader discussion.

When describing the series of steps that Gould's analytical method requires, among which is the reduction of long kintypes into shorter ones by means of particular equivalences, Kronenfeld (p. 70) denies that such operations are just *ad hoc*, pointing out the systemic recurrence of such equivalences. This opens up the question of the explicative value of such rules (see below). Let me also remark in passing that the fourth stage of the analytic process, as delineated by Kronenfeld, is: *look for the equations that relate kin terms to one another via their focal kintype*. This is illustrated first with the English example, 'a parent of a parent is a *grandparent*' (p. 71), which is formally similar to a kin term product as defined by Read,

while a second example showing the possessive case is formulated as a relative product, i.e., a parent's male child is a brother, thus marking the ambiguity of the notion of a relative product.

Gould's formal analysis is illustrated showing which equivalences allow kintype reductions for the English kin term *cousin* and, in a more complete manner, for all the kinterms of Nanjilnattu Vellalar,

Kronenfeld introduces Gould's typology of classificatory terminological systems before presenting an exhaustive analysis of the Fanti kinship terminology. This is understandable as his analysis involves the Cheyenne and Crow-type terminologies that were only briefly mentioned in the previous parts of the book. Gould's typology, as it is laid out in this essay, primarily consists in drawing the kin graphs for each classificatory type, using the sets of diagnostic equivalences for this purpose and mentioning some socio-economic factors possibly correlated with them. One of the conclusions reached by Gould is that only 6 different classificatory types occur, defined by their intrinsic equivalences: Generational (Hawaiian), Cheyenne, Tamil (Dravidian), Seneca (Iroquois), Crow, and Omaha. Kronenfeld notes that the Australian systems, notably the section systems, are « based on Tamil/Dravidian » structure, but he confesses that he is too unfamiliar with Australian terminologies to venture into any speculations. Other authors will certainly object to the Australian Kariera-type system being reduced to a Dravidian system.

Kronenfeld then offers a detailed analysis of the kinship terminology of the Fanti. This terminology comes in two alternative forms: a skewed Crow-type and an unskewed Cheyenne-type. Following the analytical mandatory steps, a series of tables are presented, i.e., kintypes for kinterms in Romney's notation, which for the non-specialist might appear tedious, skewed and non skewed kinterms on genealogy, delimitation of focal categories, etc. The analysis proper, showing consanguineal reduction of kintypes for kinterms for both skewed and unskewed versions is illustrated by particular examples and presented using exhaustive tables of kintype reduction for each kinterm, showing on the right side, what equivalences are used in the « reduction process » in each case. Symbols for kintypes are given in both Romney's and Gould's, and sometimes even in « clean Gould's forms, » while explanations for equivalences and observations are written under the tables. The specific equivalences corresponding to the unskewed or skewed Fanti systems are those of the Cheyenne and Crow-type systems respectively. This is where the non-specialist will recognize whether the author has succeeded in his explanation of Gould's system. From my point of view, he will have to become familiar with both notational systems, a process which might take some time.

The final two parts of the book, the *Overview* and *Conclusion*, bring together a series of empirical propositions (observations), questions for a future agenda, implications of Gould's system, and questions posed by Gould's findings that Gould himself did not draw but that his system suggested to Kronenfeld. Regrettably, several of these points are not developed and are just catalogued in the body of the text, making these two parts somewhat bulky and difficult to follow. Two of these observations, though, are of importance. The first one concerns « regularities » in kinship terminologies revealed by kin graphs. Kin graphs, indeed, make apparent how kin term defining features (like sex of alter, relative age of alter etc.), that subdivide a given superclass (or box) may occur in other boxes from the same graph, but may also occur in different types of kinship terminologies. Kronenfeld deduces that such « regularities » are not « intrinsic » to any specific terminological structure, but may be correlated with factors external to the terminology type and relevant to the social, economic or cultural do-

mains. An example of this is how Dakotan language kinship terminologies fall into three different terminological structures (Crow, Omaha, Iroquois) while their superclasses, respectively, display cognate terms showing the same defining features. While one may agree that regularities are not correlated with specific structures, some may nevertheless fall within the logical structure of classificatory terminologies, as Read (2014) argues that, from an emic point of view, older/younger sibling terms (more exactly ascending/descending same-sex sibling) derive from the terminological set that generates the ascending/descending kin term structures. This statement counters Kronenfeld's subsequent inference about separation of, and independence between, a structure based on relative product operations and a structure based on distinctive features, although he himself wonders (p. 157) whether such inferences are « more of an abstract interpretative frame. »

The second observation – the « most important finding » according to Kronenfeld (p. 175) — is formulated in general terms, and brings forward concepts related to the cognitive sciences. It concerns the « distinction between the cumulative effects on collective semantic systems of individual's response to cognitive ease pressures and the direct effects of the differentially shared collective system on the semantic system. » The author should have provided keys for the non-specialist reader willing to decode this sentence.

Kinship terminologies are a domain where processes involving cognitive considerations may be illustrated. Kronenfeld argues (pp. 156, 157, 168-170) that the separation between the structural system and the defining features can be illustrated in the comparison between the treatment of the father's sister referent in Ashanti and Fanti, two closely related Akan, languages, by connecting the alternative choices of which kinterm to apply to father's sister with different cognitive ease considerations. He indicates how a push towards symmetry would entail the Ashanti's choice of having a 'paternal aunt' term, *ɔsewá*, parallel to *wofa* 'maternal uncle,' while a consideration of the mother's brother and father's sister's respective social roles – important for the former, inexistant for the latter, would conduct the Fanti to the asymmetric choice of not having a 'paternal aunt' term and refer to father's sister as *na* 'mother,' a term also referring to mother's sister. This assimilation process is also justified by the looseness of Fanti residential patterns entailing the similarity of functions between the paternal and maternal aunts. Kronenfeld (p. 157) argues that the comparison between the Fanti and other Akan terminological and cognitive patterns, such as those of the Ashanti, supports his claim regarding the independence of the distinctive feature regularities from the equivalence structure.

What Kronenfeld doesn't address though, is the linguistic side of the question. While ruling out, in Footnote 36, a linguistic reconciliation between the Ashanti term *ɔsewá* 'paternal aunt' and the Fanti term *sɛw* 'in-law,' Kronenfeld does not remark or mention that the Ashanti term *ɔsewá* or simply *sewa* 'paternal aunt' is also found in other Akan languages (or dialects) for the same referent and that it is possibly reconstructable to the Proto-language. *ɔsewa*, it must be added, is a compound based on *se*, an alternative term for father, and *wa* a feminine marker, thus literally 'father female.' This compound overtly indicates in which superclass it falls. Note also that the man's 'niece' and 'nephew' term in Fanti *awofasi* (*wofase* in Ashanti) derives from *wofa* 'maternal uncle' which brings it into the *Woman's child* superclass. Consequently, I don't believe that the term *ɔsewá* in Ashanti presently results from any particular choice, as it is in all likelihood inherited from the Proto-Akan kinship terminology in which a 'maternal uncle' and a 'paternal aunt' term occurred, as is the rule for these terms

in a classificatory kinship terminology. This conclusion doesn't preclude the accuracy of Kronenfeld's propositions for Fanti *na* 'father's sister' with regard to cognitive constraints.

Looking further into this series of questions, one remarks that, except for asking what constraints lead to the types (p. 168), or to questions regarding what (external) factors may be correlated with kinship terminology specific structure or with distinctive features, no development is made in the parts dedicated to Gould's system, nor to questions related to an explanation for kinship terminology structure, nor to criteria that allow sorting out generic classificatory diagnostic equivalences. The answer to these questions is probably an objective that a formal analysis cannot reach, as its primary goal consists, by Kronenfeld's own terms (p. 60) « of finding the criteria or means which account for the assignment of kintypes to kinterms » Read (2018) has addressed two critical issues related to Lounsbury and Scheffler's equivalence rules, and the point also appears to be relevant to Gould's equivalences which are conceptually similar. Firstly, they appear as open-ended rules. Second, even if successful in reducing kintype extensions to focal positions, they do not provide an explanation for the « underlying logic of kinship terminologies. »

We can see that Kronenfeld has worked hard to make a system, whose logic and analytic capacity he admires, comprehensible to the curious reader. For this he has given much of his expertise, perhaps too much, as it may be, since his reader could feel overwhelmed by the sheer volume of graphs and tables presented in this volume. In my opinion, the least convincing part of the book lies in the two last sections whose textual organization escapes me a bit. But overall, its scientific and pedagogical challenges, as I have tried to point out, have been realized. The book certainly makes an outstanding contribution, as much by the answers it provides as by the questions it raises, to kinship terminology formal analysis and to kinship studies as a whole. I thus recommend reading this book and discussing it in the classroom.

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