Implications of Gould's *A New System for the Analysis of Kinship Terminologies*[2]

Gould's approach is explicitly etic and from a comparative perspective. Like the use of the IPA in linguistics, it uses a fine-grained analytically derived system for representing the referents of kinterms. This approach contrasts with an emic approach which defines categories in the terms used by native speakers of the languages in question. Each approach has it's uses and it's limitations.

Systematic and reasonably full schedules of a language's (/culture's) kinterms with their genealogically specified referents were being collected in the early and mid 19th century, leading to Morgan's classic1871 (1868) comparative assemblage, *Systems of Consanguinity and Affinitiy of the Human Family*. Morgan provided extensive descriptions of over 130 terminologies in a parallel form that enabled systematic comparison of the patterns of genealogical referents of the terms (Saussurean "signifieds") that made up each of the different systems.[3]

In his comparative treatment of this data Morgan recognized the major patterns of structures (mostly consanguineal)—i.e., types—a classification that, even while somewhat

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[1]This paper is drawn from the introductory chapter of a book manuscript that I am currently fine-tuning on the subject of this paper, and with the same working title. It goes with a PowerPoint set of slides.

[2]I want to thank Jerry Kronenfeld for his great help with the slides that go with this paper. For the book I owe thanks and acknowledgements to a great many people—which are included with that manuscript.

[3]Morgan's tables included the kinship term lexemes of each kinship term of each language/system, enabling some comparison as well of the actual terms (i.e. "Saussurean signifiers") among potentially related languages.

improved and fine-tuned, remains the major structural classification of kin terminological systems. His major division was between what he called "classificatory" and "descriptive" systems. In a descriptive system "lineal" relatives (relatives on one's direct line of ancestors and descendents) were distinguished from "collateral" relatives (relatives equal to or descended from a sibling of ego or of an ancestor of ego); for example, in English, mother's brother and father's brother are classed together as *uncle*s and distinguished from *father*. Alternatively, in a classificatory system some collateral relatives fall in the same terminological categories as lineal relatives; for example, in Fanti, father's brother is classed in the *egya* category whose focal member is father, and distinguished from mother's brother, a focal referent of the *wofa* category[4]

Within his classificatory category Morgan recognized the patterns that underlie what are today seen as our major structural types of kinship terminologies. The recognition of these types along with an understanding of the ways in which they contrast with one another gradually developed especially via the work of Lowie (1948:61-67), Murdock (1949:223-225) (Hawaiian-type, Iroquois/Dravidian-type, Crow- and Omaha-types), Dole (1972) (Cheyenne-type), and Lounsbury (1956) (Iroquois- vs. Dravidian-types). The types have been widely recognized, and much consideration given to the social conditions poasibly served by or encapsulated by each, and the psychological forces that might shape them. These classifications were largely based on the terminological categorization of cousins (sometimes with attention to parallel categorizations of uncle/aunt terms) rather than any analysis of whole terminological systems, and without any clear general consideration of what other parts of terminological reference might be relevant or irrelevant to the type classification. At the same time, such attempts at empirical evaluation have been much muddied by the existence of significant scholarly variation regarding the precise defining criterial attributes of/for each type.

[4]Morgan's issue was *not*, as Kroeber and many others have claimed, a distinction between systems in which each kinship term referenced only a specific genealogical position and systems that classified several genealogical positions in a single kinship term.

It is here that Gould's contribution becomes relevant. He first introduces a new notational system for genealogically specified kinterm referents that greatly facilitates their analysis. He next provides a new analytic procedure based on finding equivalence equations between genealogical positions referenced by a given kinship term, and then using these equations iteratively to reduce the range of referents for each kinship term to a specific prototypic genealogical position. The set of equations that accomplish these reductions for a given system define the *type* to which that system belongs. He then uses similar kinds of equations to provide clean, systemic definitions of the interrelations among kinterms in that terminology, and thus provide the structural frame of the type to which the given system belongs. He analyzes 40 different kinship terminological systems in this manner. He thus provides us with a good understanding of what types empirically occur, and, in the process, implies that *only* these types occur. His system for analysis helps us to understand what constrains the types—even where he himself does not lay out those constraints.

The equations, and the resulting type, define the structure of a given system. But, within that system, there are terminological distinctions that do not affect the underlying structure. **[SLIDE 1]**[5] For instance, in English, the distinction between *brother* and sister (or, more generally, the distinction based on sex-of-referent) does not make any structural difference—in calculating the term which applies to a sibling's child; it does not matter whether the sibling is a *brother* or a *sister*. *Brother* and *sister*, in English, form what is sometimes spoken of in the literature as a "superclass" (that is, a set of separate and distinct kinship terms that are structurally similar and function as if they are variant parts of the same category. Gould introduces "kingraphs" as a graphic device for representing, for a given system, these superclasses and the genealogical relationships among them. A kingraph is based on the

[5]The KEY to this slide applies to all kingraphs

relationships among superclasses in a given terminology, and that kingraph directly shows the structure that defines the relevant type. In kingraphs, the nodes are boxes which contain structurally equivalent terms which share their links to other nodes; these boxes define what I am here calling superclasses.

In terms of the debate between advocates of relative product approaches and advocates of componential approaches superclass membership with its attendant systemic constraints, including relevant distinctions among terms, depends on equivalence rules. **But**, on the other hand, the terminological distinctions internal to superclasses (such as, in English, *brother* vs. *sister*, or *uncle* vs. *aunt*) are defined by distinctive features. The reason why anthropologists have had so much trouble deciding between the two approaches turns out to be because they are complementary and both effectively necessary for different non-overlapping analytic tasks—each applying to (and needed for) a different subset of the data relationships.

The difference between what the two approaches respond to can be seen in two comparisons.

First we compare two Crow-type terminologies: the Crow proper as described by Morgan (1871:row 27 of Table II on pp. 293-382) and the Fanti skewed system as seen later in this paper. **[SLIDE 2 HERE]** Since they both are Crow-type systems, they share the common set of Crow-type equivalence equations, and the Crow-type kingraph structure that goes with them. But, if we look inside, say, the *Sibling box* in their respective kingraphs, we see that the Fanti box contains only one kinterm (the kinterm for "sibling"), while the Crow proper sibling box contains seven kinterms divided by features. The two systems make use of very different sets of distinctive features within the common frame provided by their shared Crow-type structure.

Second, we can compare the sibling kinterms of the Crow proper with those of the closely related other Dakotan cluster languages in Morgan's table. Some of these languages have

Crow-type structures, others have Omaha-type structures, and still others have unskewed structures. That is, the structures created by their respective equivalence equations cover a fair range of types. But, on the other hand, if we look at the kinterms within their respective kingraph sibling boxes we find very similar patterns of six or seven terms; and, moreover, the majority of terms for each language's siblings are clearly cognate to those of many of the others. **[SLIDE 3]** I don't have another Dakotan kingraph in hand, but we can get the effect from a comparison of the Fanti Crow-type pattern with the Fanti Cheyenne type one. This comparison makes the point even more directly. The two types were used by the same members of the same speech and cultural communities; most members of the community were observed, at one time or another, using both systems. They did not have labels for them, but used each consistently, were aware of the difference, and could talk about the difference. The two systems used exactly the same lexemes with the same focal or prototypic meanings; they differed only in their patterns of extension and in the relative products that produced the differences.

We see that the regularities picked up by the equivalence equation analysis are quite different from those picked up by the distinctive feature analysis. But, since the languages in question are quite closely related to one another—identical in the Fanti case, and, in the Dakotan case descended from a fairly recent common ancestor—we can see that the system-type equations have to be quite labile—that is, able to change easily and quickly—while the kinterms themselves (i.e. lexemes) are significantly more historically stable. The differences between types of systems is represented in part by equations relating more distant kintypes to basic prototypic kintype referents of basic kinterms (as in *"father*'s *brother* is a *father*" in Fanti), and in part by similar equations defining less basic kinterms in terms of basic kinterms (as in "*mother's brother*" defines "*uncle*" in Fanti). Thus, a change from one type of terminology to another pretty much involves small changes in already existing equations relating to largely common (or similar) prototypes. It is this relatedness and these similarities that allow Fanti

speakers to easily move back and forth between their skewed Crow-type pattern and their unskewed Cheyenne-type pattern.

Unlike the severely limited kinds of equivalence rule structures which show up in the world's kinship terminologies, the range of distinctive features which subdivide superclasses seems much more open—that is, less bound by systemic constraints and less limited to specific terminological types or superclasses.

And, beyond distinctive features that sub-divide superclasses, and sometime run across superclasses, we have other kinds of regularities that are not encompassed by the structural types. **[SLIDE 4 HERE]**

These can be, for instance, variations in the derivational relationship between relatively primary and relatively distant terms that Patrick Heady, among others has discussed.. For example, consider the tables on Slide 4.

In summary, Gould has built on traditional approaches to the formal treatment of kinship terminologies, but with several significant innovations.

FIRST His notational scheme—i.e. notational system for the formal representation of specific genealogical positions (i.e. what we speak of as "kintypes") takes F (for "father") and M (for "mother"). **[SLIDE 5]** But, in contrast to other representational systems based on F and M (where the reciprocals are S for "son" and D for "daughter"), he takes the reciprocals of F and M, respectively, as $\overline{F}$ (for "fatherling"—i.e. a man's child) and $\overline{M}$ (for "motherling"—i.e. a woman's child). This innovation allows much easier and cleaner calculation and specification of reciprocals to any given set of kintypes. **[SLIDE 6]** The slides show the system and what makes it different.

He does, where useful, make use of summary expressions defined in terms of these, such as, for particular relationships: P (for "parent") and C (for "child"), H (for "husband") and W (for "wife"), and sometimes V (for "spouse". For groups or wider categories he uses: K (for consanguine) and V (for affine), X (for cross relative, as in cross-sex apical sibling pair in a string of genealogical links) and J (for parallel relative, as in parallel-sex apical sibling pair in a string of genealogical links). I is used for self. He uses / / to enclose self-reciprocal expressions.

SECOND His efficient analytic use **[SLIDE 7, left side]** of a minimal set of formal equivalence relations to define reductions and relations—such as his use of $M\overline{F}$ and $F\overline{M}$ to label the apical cross cousins in Slide 5. We find that mother's fatherling (i.e., mother's brother's child), is the reciprocal of father's motherling (i.e., father's sister's child). Since the reciprocal of M is $\overline{M}$ and of F is $\overline{F}$, and since to take the reciprocal of a longer expression one takes the reciprocal of each symbol and then reverses the symbols' order, we see that $F\overline{M}$ is the reciprocal of $M\overline{F}$, and thus we can succinctly define apical X as /$M\overline{F}$/.

THIRD Analysis here consists of using equivalence equations to reduce longer expressions to shorter forms. **[SLIDE 7, right side]** For instance, in the skewed Crow-type Fanti system, the specific Crow-type Equivalence: $M\overline{F} \leftrightarrow \overline{F}$ (and, reciprocally, $F\overline{M} \leftrightarrow F$), along with the General Classificatory Equivalences which apply to all types of classificatory systems: $I \leftrightarrow J \leftrightarrow M\overline{M} \leftrightarrow F\overline{F}$, is sufficient to reduce the kintype range of each kinterm to a single kintype.

FOURTH The relations among the superclasses (with their relevant prototype specified) that make up a given type are shown in a kingraph. **[SLIDE 8]** In the kingraph each superclass is a box, labeled by its prototype. The relations among boxes (superclass prototypes) are traced via the F, M, $\overline{F}$, and $\overline{M}$ relations that connect them to one another, and organized in a simplified genealogical order. The separate kinterms that make up each superclass are arranged

within the box by the distinctive features on which they contrast. The kinterm relationship of "ego" to any alter (specified as a kintype) can be determined by tracing from the initial I-box through the kintype's successive F, M, $\overline{F}$, and $\overline{M}$ links; the box one winds up in will be the kintype's superclass, and the specific term will be determined by the distinctive features within the box.

FIFTH Gould's system provides clear, explicit definitions of the occurrent types of classificatory (in Morgan's sense) kinship terminologies: **[SLIDE 9]** Hawaiian-type (Generational in Gould), generic Dravidian-type (Tamil in Gould) (for which Gould includes some formally derivative subtypes), generic Iroquois-type (Seneca in Gould), and generic Cheyenne-type are shown in Slide 9, while, generic Omaha-type, and generic Crow-type are in Slide 10. These are each defined as explicit formal systems—with no dependence on incidental diagnostic equations. **[SLIDE 10]** These are *all the types of classificatory systems that occur*. The type system definitions enable us to distinguish what is logically intrinsic to each type vs. what other information (contained in the distinctive features that subdivide the boxes) occurs in systems of each type, and which could potentially represent empirical correlates that might say something about the cultural uses of specific types of system.

The Importance of Gould's System and Findings

Gould's clean, formal, systemic definitions of the types: Hawaiian-, Cheyenne-, Dravidian-, Iroquois-, Crow-, Omaha-types, plus some subtypes formally derivative from Dravidian-type (Gould: 2000: Ch. 9) make absolutely clear what defines a given type and what aspects/parts of relevant terminologies are accounted for by the type definition. By doing so he makes clear what about a given system is *not* logically entailed by the type, and thus which needs further explanation—be such explanation economic, social, psychological, or linguistic. Such external factors might include what features correlate with the presence of the type, as well as what factors correlate with (or, possibly generate), the features which subdivide the superclasses.

Gould's system is a notation system and a system for analysis. From applying it, I have drawn some conclusions—based on the results of seeing it applied to an extensive number and variety of systems. Most of this application consists of illustrative applications by Gould ("illustrative" meaning that he was demonstrating the application but drawing none of the further inferences/conclusions that I have gradually come to see.

The substantive empirical propositions involved include

1) that the referents of each kinterm reduce via Gould-type equivalences to a single prototype (or root), allowing for the exception of well-defined homonyms represented by separate concurrences.

These homonyms fall into superclasses that contrast with the superclasses of their concurrent kintype expressions. (e.g., in Fanti, the father's sister kintype is labeled by the kinterm of mother, and thus is concurrent with mother (along with mother's sister etc.) as referents of the "mother" kinterm; but the two belong to different contrasting superclasses—mother is in the Mother-superclass while father's sister is in the Father-superclass.)

The parts of Gould's analytic system—as its reliance on the substitutability of one of two formally equivalent expressions for the other in any/all longer expressions—are falsifiable and hence empirical. And the systematic substitutability, finally, reduces to a claim concerning whether or not kinship terminologies indeed form the kind of mathematical structure that Gould (along with Lehman, Read, and others) treats it as having. This assertion holds up well, **but**, compared with most of the rest of language and culture, looks both very powerful and very strange ! Only syntactic structure seems as formal.

2) that all kin terminological systems can be reduced via Gould-type equivalences to a structure of superclasses with included kinterms represented by the prototypic (or focal) referents of each kinterm and, via the superclass's focal kinterm, of the superclass. This completeness is,

in my experience, really unusual, and hence, to me, implies the presence of one of "nature's joints".

3) that all such structures, as seen by Morgan, fall into one of two meta-types: classificatory or descriptive, and, further, that all classificatory systems fall into one or the other of the six listed types (Hawaiian, Cheyenne, Iroquois, Dravidian, Crow, Omaha).

The limitation of such collective systems (collective representations, in Durkheim's term) in this domain to just these few types, given that we know of cases in which the implied componential attributes (that is, the observed generalization of defining semantic components in ways that are inconsistent with the equivalence structure, but which do not wind up undermining that equivalence structure) show how a strong individual-perspective-based cognitive pressure to pull away from the equivalence structure is not sufficient to undermine the multiple-perspective-based equivalence structure. A salient example is the case of inclusion of father's sister in the Fanti *na* mother category (as discussed elsewhere in this paper and in Kronenfeld 1980a and b) but not in the *na*'s Mother superclass in the equivalence structure itself (as shown in this paper).

My supposition is that the structural types into which kinship terminologies fall are based on the need of users to understand second and third party relations from different individual personal perspectives. So, if you, my mother's sister, are telling me about your daughter's cousin, Z, I need to know who that cousin could be to me, and what to make of your phrasing—using the daughter as a reference point vs. using me (i.e., speaking of who that relative would be to me). We have to be able to switch among 1st person, 2nd person, and 3rd person perspectives—and often cross-reference them. And it's got to be simple enough for a 4 year old to have basics and a young teenager to be proficient. This need amounts to a constraint that keeps selecting for versions that work collectively. This kind of perspective complexity is rare in language—limited mostly to personal pronoun systems.

If my finding, and my inferences from the finding are correct—or, even, close to correct--then the implications of the finding for cognitive anthropology are enormous. We have here

fairly hard evidence for the existence of a distributed collective (vs. individual) cognitive system, including evidence suggestive of how it works.

4) A kind of evidence—if only suggestive—of the intrinsic separation between the structural system with it's relative product structure and the distinctive features which reflect

efficiencies in learning and usage can be seen in the kinterm applied to father's sister in Fanti and in some other Akan languages such as Ashanti.[6]

Gould's treatment of the Fanti use of *na* for father's sister as a "concurrence" (vs. an equivalence)—that is, as a kind of homonym—is correct in terms of the Fanti equivalence system, and the structure and type it implies. But that characterization is a little misleading in the

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[6]From a cognitive ease perspective, there takes a certain amount of usage to maintain a given word (with its distinct signifier) in the language. This can be seen as a cost in situations in which natural occasions to use the word are insufficient for maintenance and so some time and effort must be invested in getting young children to learn and use it. For terms that do not achieve a sufficiently high level of usage, the easiest option is to take relevant signified as a marked/extended sense of some other term that is similar and has similar implications for ordinary action. In this context, and given Fanti looseness and flexibility concerning who lives where, father's sister functions pretty much the same as mother's sister—who is, on a more general basis (concerning lineage and inheritance relations as well as residential patterns), labeled as an extended referent of *na*, their mother term.

So, by the normal way that extension works, calling father's sister *na* (i.e., "mother") is an easy way to go.

However, another kind of cognitive ease consideration suggests that it is easier to consistently make or not make any given distinction within a given set of terms than it is to make it in one place and not another.

In our present Fanti example, father's brother is an extended referent of *egya* (the "father" term)—in the same way that mother's sister is an extended referent of *na* (the "mother" term). But, in Fanti, as in other matrilineal systems, the contrast between mother's brother (*wofa*) and father (*egya*, including father's brother) is crucial.4

In this case, since the mother's side vs. father's side is necessarily made for parents' brothers (what we call *uncles* in English), consistency would suggest a similar distinction for parents' sisters (what we call *aunts* in English). The closely related Ashanti language (or dialect), in contrast with Fanti, does have such an aunt term for father's sister.

This comparison and the Akan pattern that it exemplifies suggests that both "cognitive ease" pressures are felt, and thus cognitively alive. And it offers some support for my claim concerning the formal (and maybe cultural and linguistic) independence of the equivalence system regularities from the distinctive feature regularities.

Additionally, it is worth noting that the Fanti push to extend the reference of *na* to father's sister has not led to any change in the equivalence equations or the structure that they produce or the type into which that structure falls. That is, this limitation on the reach of na's extensions in Fanti reinforces the idea that there are wider socio-systemic constraints on the forms of structures that can be taken by kinship terminologies.

sense that it ignores the socially significant similarity between mother's sister and father's sister which the feature-based terminological assignment reflects (see Kronenfeld 1980a).

My assertions, while richly supported by much data from many terminological systems, have not been tested in any way that would make them proven universals[7]—hence they remain as hypotheses. But, each one of these is a set of empirical assertions each of which is potentially subject to empirical disconfirmation.

Gould's system, as a kind of mathematical construct, is not itself falsifiable in any obvious sense. It is a logical system that fits well with a wide and varied range of empirical data. My inferences from his analytic system concerning regularities within and across kinship terminological systems raise the question of whether or not these inferences are empirical propositions subject to disconfirmation as a set of propositions, or are a more of an abstract interpretative frame.

My generalizations do make empirical assertions about actual data relations and work demonstrably well enough to not be vulnerable to any general "mispredicts" challenge. Each

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[7]There remains the question Greenberg treated about "universals". Greenberg's universals had some very few (apparent) exceptions; but, when examined closely, these often were the epiphenomenal effects of immediate history (cf. voiced vs. unvoiced vowels with collapse of unvoiced vowel series. That is, there can sometimes be 'non-fatal' exceptions. First, sometimes reporters (ethnographers or field linguists) do make mistakes. Second, sometimes a tentative regularity—such as the frequency of voiced vowels always exceeds that of unvoiced—appears to be undercut by a counter example—say, a more frequent voiced vs. unvoiced [i]; but when examined those case turn out to be ones in which, say, the complete set of unvoiced vowels can be shown historically to have collapsed into the single [i]—meaning that the present observed [i] frequency actually represents the joint frequency of the full set of unvoiced vowels. [[My example is a hypothetical one, but Greenberg had very similar real ones—which I can't now remember !]] Third, the posited regularity can be a statistical one, wherein, say, in one out of one-hundred cases the .01 shot is hit ! Fourth, the example may not be a true universal but, instead, a very strong empirical 'bias'—what Greenberg calls, as I remember it, a "near universal".

and all of the terminological assignments that my application of the Gould system makes can each be seen as a prediction that is potentially falsifiable.

In a sense the analytic system's larger parts—such as its reliance on the substitutability of one of two formally equivalent expressions for the other in any/all longer expressions—are falsifiable. But, finally, the interpretative question reduces to a decision concerning whether or not kinship terminologies indeed form the kind of mathematical structure that Gould treats them has having (and see work by Lehman, Read, and me, among others). This interpretation holds well in the sense that such structures do a really good job of representing the relations among kinterms and of kinterms to genealogical relations that users presume and rely upon in their kinterm usage and in their explanation of their usage.

Yet, such systematic precision looks very strange when compared with most of the rest of culture—even if, within language, syntax shows comparable regularities !

Nonetheless, Gould's analytic system does *not* give us a complete picture of the regularities of the shape or content of kinship terminologies. There are limits to what Gould's analytic system, as here described, does If we accept the regularities that come out of Gould's equivalence equation based analytic approach, we still are left with the parts of systems that it covers but does not address—the parts within superclasses that seem governed more by distinctive features.

The future.

Gould's system represents a comparative (or etic) perspective, as do most, but not all, past analyses of kinship terminologies. That is, it does not analyze each system via its own concepts, but utilizes the basic parent-child focus which all kinship terminologies share and on which all are based. As such it captures the genealogically based relations, categories, and structural patterns that all kinship terminologies contain, but it does not build in the kind of direct categorical reasoning that speakers/users often use to determine the kinterm category of

presumed relatives whose actual genealogical relationship is unknown—relations that can be captured by emic approaches based on native speaker concepts. That is, it does not recognize the specific structures that can be built directly out of native speaker concepts. Still, even if it does not directly affect emic analytic approaches based directly on native language categories and operations (i.e. native speaker definitions of kinterm categories and determination of kinterm referents), it may possibly turn out to imply some constraints on such systems.

Thus, Gould's system does not, even if accepted, mean any end of kin terminological research or theory, but it does change the game. —by enabling the finding (seeing and framing) of empirical regularities and simplifications previously unseen.