

Formal Structures and Symbolic Logic

Major topics of enquiry which the comparatively recent social sciences were to subsume under the heading 'language' were largely inherited from philosophy and symbolic logic, where the first comprehensive treatments of the subject were produced. Philosophy's concern with the nature of a language arose via attempts to analyse the notion of 'literal description.' Consequently, the focus of attention was on matters like truth, proof, reference, denotation, assertion, proposition.

In particular, the logics of the rationalist philosophers consisted in apparatus specifically designed to formalise just these concepts. It was here that the first formal accounts 'in so many words' of what a language was and how it was used were produced.

Frege's predicate calculus, designed to explain arithmetic as nothing more than logical operations, is generally acknowledged as the most important early example of this achievement. It incorporated a complete philosophy of language in its construction. The language was designed basically to solve two questions: how do you build a statement or proposition, and how do you decide if it is correct. Descendants of Frege's predicate calculus became the workhorses of mathematical logic in the twentieth century. They all shared a similar core structure which consisted of, in outline:¹

¹ For the reader who missed or does not remember his elementary logic class I have included a brief exposition of propositional calculus originally composed for other

A vocabulary:

The basic symbols you build statements with. These were of various types and functions: names, variables, predicate functions, connectives, operators, punctuation marks ———.

A syntax:

1. The axioms or rules that told you how to build statements starting from the basic symbols. These were of various kinds and operated on several levels of organisation.
2. The axioms and/or rules that specified the arrangements, or strings, of statements that constituted valid proofs.

A semantics:

This consisted of:

1. A specification of the objects and structures contained in the model or world the language was to discuss.
2. A mathematical function associating certain basic symbols with objects and structures. A name might be mapped into a specific number, a variable into a set of numbers, etc.
3. A set of semantic axioms or rules, specifying the state of affairs described by a given statement and the procedure of discovering if this state of affairs indeed existed in the model. The semantic rules operated

purposes. This might be helpful in indicating the flavour of the approach to describing language for which the rationalist philosophers of the early twentieth century were responsible.

by taking into account the basic symbols in a statement and how they were organised.

The Development of Descriptive Linguistics

The task faced by descriptive linguistics was different in principle from that faced by the philosophical tradition just discussed. The latter tradition was engaged in a legislative enterprise where a symbolic structure was to be more or less invented to serve certain specific purposes. However the model of what a language consisted of that emerged from this tradition was to serve as the detailed paradigm for linguistic research and theory directed to analysing natural language. The parallels went much deeper than the inheritance of the familiar categories, syntax, semantics, vocabulary. The whole detailed approach taken by linguistics as to what syntax, semantics and vocabulary consisted of, how it was used, and how to find out about it, paralleled the specific procedures and approaches to meaning found in the predicate calculi and the philosophical tradition which they represented. This, of course, had far reaching effects on the nature and results of the empirical activities which linguistics evolved. We might characterise some of the more obvious, but important parallels:

Definition of language

Like philosophy, linguistics conceived of language as a formal structure, making it a Platonic *entity*, a *thing*. This meant that actual linguistic activity, as

such, was not the subject of the discipline, the subject being the language. As a result what was to become defined as linguistic analysis employed a methodological format termed by Garfinkel constructive analysis:

In a search for rigour the ingenious practice is followed whereby such expressions are first transformed into ideal expressions. Structures are then analysed as properties of the ideals, and the results are assigned to actual expressions as their properties, through with disclaimers of ‘appropriate scientific modesty.’²

The transformation into ideal expressions consisted of regarding speech acts as performances in, or instances of, the use of the entity—language. The presence of the entity and its structure were discovered *from* speech acts, where such discovered structure was specifically not the structure of the speech acts themselves:

When a speaker of the language makes an utterance, it is then speech realised as *an instance of a linguistic form*. In the terminology of communication theory, a language is a system of types, an utterance or speech in the language is a token. The sentence, ‘Come here!’ is a type. When someone actually says ‘Come here!’ it is a token.

...and linguistics, which is concerned only with the general type whenever it occurs, *is the study of types*. For psychological or historical reasons speech is often less

² Harold Garfinkel and Harvey Sacks, ‘On Formal Structures of Practical Actions,’ in *Theoretical Sociology: Perspectives and Developments*, John C. McKinney and Edward Tiryakian (eds) (New York, NY: Appleton-Century-Crofts, 1970), pp. 2.

systematic than language as an ideal system.³

Once the structure of language was obtained, this structure was reassigned to actual speech acts in a second level step:

The generative grammar internalised by someone who has acquired a language defines what in Saussurian terms we may call *langue*. In performing as a speaker or hearer, he puts this device to use. This as a hearer, his problem is to determine the structural description assigned by his grammar to a presented utterance, and using the information in the structural description, to understand the utterance.⁴

This is one example of various *theoretical* attempts to perform this second level step. In general, these attempts were empirically empty—research on how to put these structures back into the world, so to speak, ended up not being the business of the linguist, while as a theoretical topic it became a lively side issue. The so-called theory of performance, distinct from the theory of language, was left to psychologists and other social scientists along with the task of providing empirical support for propositions about how persons actually learn, speak and interpret language, *i.e.* how persons perform.

The Research Topics

While the diversity of problems offered by natural language was widely acknowledged, the main research programme that evolved centred around

how one builds, and how one interprets, ‘the sentence,’ the linguistic parallel to the ‘proposition.’ Phonetics identified basic vocabularies from which sentences were shown as built. Syntax sought the rules that built the sentences from the basic elements. Semantics attempted to provide the meaning of sentences by reference to their parts and organisation. Efforts in these areas proceeded in outlandishly parallel ways to the procedures used in the construction of formal languages. The most well-known of the many and intricate parallels is the definition of the syntax of natural languages as consisting of a series of mathematical transformation axioms working on units of vocabulary. It should be emphasised that this is only one particular mathematical approach to the definition of syntax. To give an alternate, category functor theory in mathematical logic and algebra offers a contrasting approach to the definition of syntactic structure. Interestingly enough, the major successes of semantics were obtained for the area of lexical meaning—which involved closely parallel notions to that of model, reference, etc.

Descriptive Procedures

The pervasive format, for a rigorous analysis, followed at all levels in linguistics is a familiar one discussed in phenomenology as ‘the organisation of elements.’ This was identical to the format decided upon in the logics, as an inspection of my presentation will reveal (see appendix). The format consists in partitioning all examples of a phenomenon in various ways until a way is discovered to describe any example as comprised of members of a set of fixed

³ Yaen Ren Chao, *Language and Symbolic Systems*. London: Cambridge University Press, 1968, pp. 11.

⁴ Noam Chomsky, *Current Issues in Linguistic Theory*. The Hague: Mouton, 1966, pp. 10

elements. Then axioms are devised which will, hopefully, organise these elements in all and only those arrangements found in the data. Henceforth, the analysis of a case of the phenomena consists in formulating it as a rule-governed arrangement of the elements:

On the basis of a limited experience with the data of speech, each normal human has developed for himself a thorough competence in his native language. This competence can be represented, to an as-yet undetermined extent, as a system of rules that we can call the grammar of his language. To each phonetically possible utterance the grammar assigned a certain structural description that specifies the linguistic elements of which it is constituted and their structural relations.⁵

This analytical procedure forms the single method of a sub-area of mathematics called 'constructive mathematics.'

In the sense of Kuhn's *The Structure of Scientific Revolutions*, the perspective we have discussed comprises a paradigm for theory and research. As such it is presently being found inadequate from all sides. Sociologists and anthropologists are calling for revisions of the notion of meaning to take into account widely documented social functions of language.⁶ Linguists are finding the analytical model awkward and hopelessly restrictive for analysing structures and meanings across

utterances.⁷ Even in symbolic logic, the notion of formal language is being revised to include many hitherto unused features of natural language, indexical expressions, indirect reference, virtual objects.⁸

Our particular interest in this paradigm concerns one of its basic recommendations not yet called into critical question—that language be studied and treated as a mathematical entity. Insofar as this view is adapted, verbal communication consists of skilled application of a collection of explicitly storable rules of generative grammar, which participants in some sense 'know.' Then an adequate explanation of the activity consists in demonstrating how the rules are acquired and how their skilled use enables the verbal activities of an interaction to be accomplished. This is precisely the problem handed to social scientists by linguists. However, carrying out such a research programme is becoming more and more impossible in the face of a rapidly-growing inventory of 'awkward' empirical facts about verbal communication, among which are the following:

1. Such rules can not operate as explicitly sanctioned norms, since large numbers of them are demonstrably unknown to their users explicitly, and even if known, the temporal demands of

⁵ *ibid*, pp. 8 – 9.

⁶ Dell Hymes, 'Introduction: Toward Ethnographies of Communication,' *American Anthropologist*, 66(6): 11.

⁷ Ethel M. Albert (1964), 'Rhetoric, Logic and Poetics in Burundi: Culture Patterning of Speech Behaviour,' *American Anthropologist*, 66(6): 35.

⁸ Richard Montague, 'Pragmatics,' unpublished paper, Department of Philosophy, University of California at Los Angeles, 1963.

verbal interaction make their explicit employment impossible.⁹

2. Assume such rules constitute internalised norms, acquired habits, unconscious dispositions. Then no known theory of learning or inference can account for how such rules come to be known, consciously or unconsciously:

Contemporary work has finally begun to face some simple facts about language that have been long neglected, for example, the fact that the speaker of a language knows a great deal that he has not learned and that his normal linguistic behaviour can not possibly be accounted for in terms of ‘stimulus control,’ ‘conditioning,’ ‘generalisation and analogy,’ ‘patterns,’ and ‘habit structures’ or ‘dispositions to respond,’ in any reasonably clear sense of these much abused terms.¹⁰

3. Experimental evidence indicates that practices of conversing are such that parties to an interaction can successfully produce and interpret utterances when the assumption of the presence of shared linguistic knowledge,

understanding and agreement is demonstrably false.¹¹

4. Problems of ‘error’
 - a) Parties to communicative actions habitually and in regular ways speak in fashions inconsistent with the purported rules of their language, and do so in the interest of accomplishing everyday verbal activities in a routine manner.¹² Such usage is variously termed nonsense syllables, noise, slang, idiom, dialect, expressive or emotive communication, where such designations serve as wastebasket categories, in the face of the fact that the detailed analysis of such usages completely escapes linguistic technique.
 - b) It has been demonstrated that for activities known to their participants as rule governed even if the explicit rules are not known, where language activity provides an example, the activity provides for its participants a set of recognisable ‘incorrect,’ ‘unfair’ or ‘problematic’ options as performable actions towards specific intents.¹³ Clearly the rules themselves don’t analyse how, and on what occasions, and in what ways, their own

⁹ Frieda Goldman-Elsler, ‘Discussion and Further Comments’, in *New Directions in the Study of Language*, Eric H. Lenneberg (ed.) (Cambridge, MA: MIT Press, 1966), pp. 115 – 116.

¹⁰ Noam Chomsky, *Cartesian Linguistics*. New York, NY: Harper and Row, 1966, pp. 73.

¹¹ Harold Garfinkel, *Studies in Ethnomethodology*. Englewood Cliffs, NJ: Prentice-Hall, 1967.

¹² Chao, *op. cit.*, pp. 123 – 133.

¹³ Harold Garfinkel, ‘A Conception of, and Experiments with, “Trust” as a Condition of Stable Concerted Actions,’ in O.J. Harvey (ed.), *Motivation and Social Interaction*. New York, NY: Ronald Press, 1963: 187 – 238.

violations become warranted actions.

5. Indexical expressions: by this term is meant expressions whose sense can not be determined without certain knowledge of the context of their use—the speaker who uttered them, the time, place, past events of the interaction, etc. Such expressions include ‘here,’ ‘now,’ ‘he,’ ‘today,’ ‘soon,’ etc. The use of natural language is fraught with the presence of such expressions and no known methods of linguistic or mathematical analysis of the type being discussed are sufficient to analyse how such expressions, as employed in natural language, come to be understood. The difficulty consists in the apparent impossibility of providing a formal analysis of context which suffices to define the meaning of these terms.¹⁴

An Alternative Approach

For philosophy and logic the treatment of language as a formal structure made the activities of argument and interpretation doable, by procedures of *explicit inference*—that was its purpose, that was its contribution. To interpret a statement in such a language one could consult the symbols of that expression, use a formally stated axiom as a rule of interpretation, and thereby obtain a definite output, the meaning(s) of the expression. Similar methods were available for obtaining a next expression

from a previous one, in the act of doing, ‘proving.’

The great philosophical virtue of this activity was that, in the very act of doing it, you assured the fact that exactly what you did was available for the telling. That is, the input, the instruction (5), the output, were all known *explicitly*. A linguist who doesn’t know a language, for instance, might act this way—come to speak an utterance by consulting a dictionary and grammar.

Now we might ask if explicit inference affords us a behavioural model. Clearly a different model is needed for a speaking native, than the one described for our linguist. The main difference here is that at least one term, the rule(s) of grammar employed, is known to the native only *tacitly*. In ‘The Logic of Tacit Inference’ and *The Tacit Dimension*, Polanyi argues convincingly that explicit inference can *never* provide a behavioural model, not even for the acts of the mathematician. Using historical materials, *Gestalt* psychology, and experimental results in the area of ‘subception’ he claims that inference, while it is being done, always has an intentional structure, that is proceeds ‘from’ a *necessarily tacit* term (the distal term) ‘to’ an explicitly known term (the proximal term).

It can be seen that for philosophy and logic, the purpose of constructing a formally-defined structure, the language, to do interpreting and arguing in, is to provide an automatically available explanation of what an interpreter, an arguer, did *independent of what he did* (behaviourally). Such a guarantee is invaluable for the goals of these disciplines. Such a guarantee is

¹⁴ Garfinkel and Sacks, *op. cit.*, pp. 14 – 16.

something one obtains by studying verbal communication in the way just discussed. And it is submitted that this guarantee is not what is wanted.

As a different way to proceed, we take as our phenomena the characteristics of the improvisational procedures, patterns of inference, interpretative techniques, by the use of which persons do talking, reciting, complaining, assembling a conversation or an argument. Our observational techniques are concerned with *a search for these practices*. To this end it is necessary to suspend our system of beliefs about what these practices consist of, how to look so as to see them—a system whose correctness does not depend upon how people converse but, instead, is a way of interpreting whatever they do. In short, we must not treat language as a formal system. This implies that structures, rules, become only phenomena, features of data, and not explanatory devices. These features can only be elements of actual interactions produced and recognised by participants *if and when* this occurs, and only then.

The Occasioned Corpus

Zimmerman and Pollner characterise this approach as a technique to ‘make strange a familiar world,’ speaking of treating a phenomenon such as a conversation as an ‘occasioned corpus:’

1. The occasioned corpus is a corpus with no regular elements, *i.e.*, it does not consist of a *stable* collection of elements.
2. The work of assembling an occasioned corpus consists in the

ongoing ‘corpusing’ and ‘decorpusing’ of elements, rather than the situated retrieval or removal of a subset of elements from a larger set transcending any particular setting in which that work is done.

3. Accordingly, from the standpoint of analysis done under the auspices of this notion, the elements organised by the occasioned corpus are unique to the particular setting in which it is assembled, hence ungeneralisable to other settings. That is, for the analyst, particular setting features are ‘for the moment’ and ‘here and now.’¹⁵

Ongoing Research

Addressing verbal communication from this perspective has already produced extensive methodological and substantive findings entirely missed by constructive analysis. A few examples:

Garfinkel has uncovered a number of semantic practices that contrast sharply with the current notion of meaning and offer convincing evidence that understanding utterances does not consist of doing a parsing analysis of them via semantic transformations. Such practices may be categorically indicated as ‘glossing,’ ‘wait and see,’ ‘contexting’ practices:

And apparently speakers can proceed by glossing, and do the immense work

¹⁵ Don H. Zimmerman and Melvin Pollner, ‘The Everyday World as a Phenomenon.’ In Jack D. Douglas (ed.), *Understanding Everyday Life*. Chicago: Aldine, 1970.

that they do with natural language, even though over the course of their talk it is not known and is never, not even 'in the end,' available for saying in so many words just what they are talking about. Emphatically, that does not mean that speakers do not know what they are talking about, *but instead they know what they are talking about in that way.*¹⁶

Schenkein has produced an extensive structural, semantic analysis of a class of sounds which under ordinary formulations should have no, or trivial, meaning:

The class of utterances I seek to investigate can be provisionally indicated by noting some prototypical member: *heheh*. The provisional status of this designation intends to draw attention to the following: while class co-members with *heheh* are routinely unavailable to depict, delineate, describe, detail, or otherwise referentially define some action or activity in a member's report, they are meaningfully understood and have conversational consequences on the occasion of their use. Members have available and use some array of formulations which stand as proper glosses for saying in so many words such things as what-you-did, what-that-means, what-just-happened, what-we-are-like, what-they-are-doing, etc., appropriate to adequately describe some occasioned use of *heheh* or some class co-member—for example, *laughing, smirking, ridiculing, being polite, being nervous, understanding, agreeing, judging*, etc. Since the potential semantic differences of referentially replicable utterances, such as *uh* and *uhuh* or *book*

¹⁶ Garfinkel and Sacks, *op. cit.*, pp. 8.

and *intelligent*, are readily discernable abstractly by both the lay and professional conversational analyst, while the distinctiveness of *heh heh heh vis-à-vis heheh* is apparently more obscure it has been recommended to the professional analyst that utterances like *heheh* are of a different order, and/or that they require analysis with some specially tailored machinery and methodology, and/or that they can be treated as only incidentally or not at all meaningful verbal forms, and/or that they can warrantably be distinguished from these utterances for which referential definition is decidedly nonproblematic.¹⁷

Finally, Sacks has analysed an enormous variety of practices and activities involved in the use of 'names' in conversation, of which the activity of 'denoting' is but the simplest and most socially trivial example.¹⁸

The Focus of This Research

It is the purpose of this research, while retaining the perspective just outlined, to take advantage of certain especially helpful data provided in the case of mental illness, for the discovery and analysis of certain of these conversational practices and procedures of inference. Specifically, two categories of such practices will be studied:

¹⁷ Jim Schenkein, revised draft of a paper prepared for the Summer Workshop, 'Language, Society and the Child,' University of California at Berkeley, Summer, 1968.

¹⁸ Harvey Sacks, 'The Search for Help.' In Edwin S. Shneiderman (ed.), *Essays in Self-Destruction*. New York, NY: Science House, 1967.

On various occasions in verbal interaction it becomes a visible feature of the interaction that one or more parties are not being understood or are not understanding the other. Enquiry will be directed to:

1. The methods whereby this feature of a conversation comes to be made visible.
2. The methods of inference—face-saving devices, ‘passing’ procedures, attempts at residual action, faking techniques—parties employ in the face of such a visible feature, to have a conversation nevertheless.

Certain cases of schizophrenia involve speech patterns widely distinct from ‘normal.’ So, when medical personnel, relatives, friends, etc., speak to such patients, abundant and ongoing examples of these phenomena are provided.