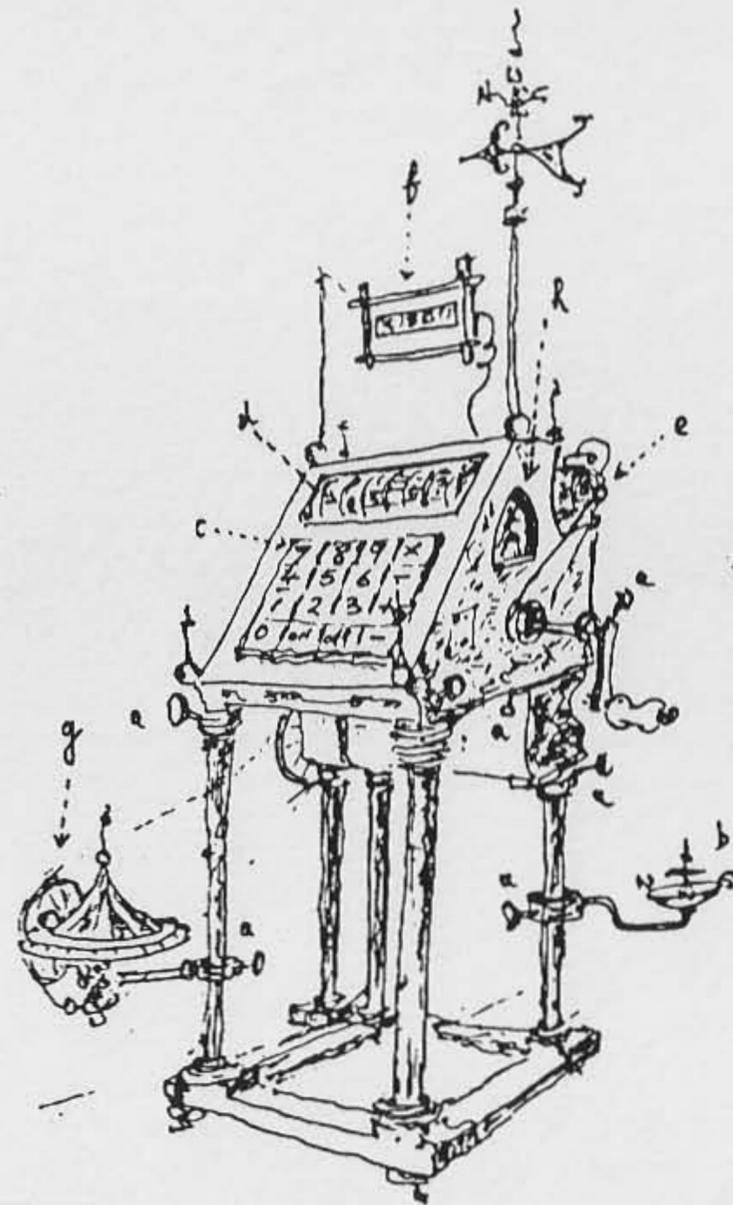


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Conversation & Support
Gordon Pask



INAUGURAL ADDRESS

presented November 30th, 1987 at the occasion of assuming responsibility as guest professor in General Andragology, at the Faculty of Educational and Andragological Sciences, especially to participate in the Research Programme Ondersteuning Overleving & Cultuur (OOC).

Rector Magnificus, Chairman, the Board of the University of Amsterdam, Ladies and gentlemen, Colleagues,

My appointment as guest professor is listed as being in General Andragology. I will not explain this topic in full, even though I appreciate that it is quite usual to do so in an inaugural address. In order to compensate for this possibly disappointing omission, I should, however, at least say this. Andragology deals with a combination of areas, in the social and organisational sciences that in other countries can only be studied separately (although there is a growing number of exceptions to this rule). This combination has a lengthy and special history in the Netherlands. It also, sometimes, has evoked debate.

Coming from elsewhere, the United Kingdom, it would be improper for me to comment at any length upon this history or this debate, in general. My task is to participate in and contribute to the fruitfulness of the area, in any way I can, and not to let you down in the end. It seems most appropriate, therefore, to summarize this - my first and last, and very short - introduction to Andragology by stating that I feel honoured to have gained election as guest professor in General Andragology, at this university. My remarks in this address will be of a more specialised character.

It will be my pleasure to participate in an exciting research programme, the OOC programme ("Ondersteuning, Overleving, en Cultuur"), or (in English, roughly "Support, Survival, and Culture"), that has been designed by Prof. Dr. G. de Zeeuw, of the Department of Andragology in the University of Amsterdam, and initiated under his leadership. The programme is funded by the Dutch Ministry of Education and is expected to last 8 years.

The programme addresses basic societal problems that arise for example in adult education, but also appear when dealing with social helping, and with social support systems in general. These are typical of problems which have been and are of central concern in Andragology. It also addresses them in a special way, trying to deal

with basic issues of the design of social support and of social improvement. The research marks, we anticipate, the dawn of work in a novel and fruitful paradigm, presumably with interesting and useful 'spill-over' effects to other parts of social science.

To delineate what I see as my contribution, I will note some major issues, the first two of which deal with conventions of language use, and the rest with special characteristics. of the field.

1 CONCEPTUAL THEMES

(a). The concept of "problem" is ascribed a wider than usual meaning, for serious reasons, both in the programme and, as I am told, in andragology. "Problem", in the approach adopted, is something arising out of disquieting circumstances, which may be, in propitious cases, formulated AS a problem. Each and every problem is therefore linked to distinguishable and separable individual or collective actors, or groups that behave as actors; and problems may occur in parallel or in clusters.

Hence, the solution process must be a mode of interaction between these actors, amongst whom there may be those who sensed the original hazardous or disturbing circumstances. Of course, such a solution is unlikely to be unique and equally unlikely to be neat and tidily fixed. Also, it must involve costs for some of the actors (and hence concomitant loss of quality) - i.e. costs in terms of the commitment of financial and personal resources which therefore can not be used elsewhere, and possibly in the form of unpleasant side-effects to some actors. Solutions will therefore involve tricky maintenance acts.

This interpretation of the concept of problem is special and distinctive in that it straddles both those areas that are usually distinguished as the value-free and the value-bound. It can therefore help in opening up for enquiry the link between these areas, unlike those other more causal approaches in which, unfortunately, only the first area is accepted as part of scientific endeavour. This, somewhat specialised, conception of a problem, its formulation and possible solution, becomes an important tool.

(b). The 'problems' that are of focal interest in the programme have become especially poignant because this is the age of information, in Europe and also globally, in which, whether we choose to notice it or

not, much of the human environment is dominated by processes of control, computation, information and the architecture of knowledge. Of course, this statement does not deny the importance of the natural ecology or the architecture of cities, urbanism, and so on. But a new landscape has evolved, which, for brevity, I shall call the "information environment" (see note *1), a concept around which I will organize my address. Its existence has ushered in a new era, some of the birth pangs of which make the OOC programme especially timely

Let us pause for a moment, so that you can think about the significance of the last couple of statements. That also gives me a chance to elaborate upon the theme, by suggesting that, in a sense, it is odd, in a way even perverse, that many humans remain unaware of the appearance of this information environment. They sometimes may notice its symptoms, as in articles lauding novel technologies in glossy magazines. But they more often remain unaware of the underlying changes, that is, unless it goes wrong.

It goes wrong (and we do notice), to name a few examples, when the informatic and control systems of power distribution go wrong and New York is plunged into darkness, when there is a 3 mile island incident or a Chernobyl disaster; when even more dramatic events are triggered by our own, usually aggressive-type, stupidity - the same type of stupidity which nowadays turns a war, which might once have been a jousting-fight, into a major catastrophe. Or when a virus, like AIDS, is likely to become a plague (when it becomes newsworthy and the target of propaganda) or when the social equivalent of viruses (they use that word alongside the word worm, to designate Maverick program segments in computer science) go amuck, to yield riots, gross imbalances of power, alienation or unsuspected illiteracy.

Such problems are large, and obviously 'wrong enough' to make us aware of the changes in our information environment. Still their magnitude is seldom appreciated. On top of that, I suggest that their

* See list of references at the end

startling effects can still be seen as relatively innocent shocks. We can still escape awareness, as when we judge their locus of control to be outside our reach, and thus ourselves not to blame. But there are less innocent and more bedeviling events operative in the information environment, at less publicised levels. New York may suffer darkness, but it seems even more tragic when the information environment of social security and social service goes wrong and a client is culturally obliterated by an inept clerk at the office desk. We may be unaware, but the locus of control here is within our reach and we are responsible.

It is hard to overemphasize the impact of the many recent changes in our information environment. It has changed the distinctions that are made in society, changed ideas of distance and proximity, spatial and temporal and cultural. It has changed our values, and what we see as our closest environmental allies. As some kind of tag point let me parody the matter with a tale of ancient days. Long past, people built or bought houses and, later on in life, sought the luxury of a telephone. Nowadays, of course, people make or buy a telephone, connect it somewhere and seek the luxury of a fixed home.

I do not dispute the necessity or relevance of these changes. It is however, greatly in our common interest to be aware that our social landscape is being reordered drastically, via ever so many rapids, currents and eddies in our information environment, and that what once we found stable is now quicksand and that what once was quicksand has now become ship sinking rock. Controlling such changes, possibly deflecting some of the more disastrous effects, preventing entrenchment by infusing variety, must become worthy objectives. That the means to implement these objectives may lie embedded in the very concepts of 'problems' and of 'information environment', as described already, is of particular interest to me, as it is to the OOC programme.

2 CHARACTERISTICS OF THE OOC PROGRAMME

Much of my experience has been in fields which are different but have a similar flavour and I expect this to be of value in the OOC programme. Before I go into detail about the role I ascribe to this experience, however, let me discuss a few of the features that distinguish the scientific programme 'Ondersteuning, Overleving and Cultuur', but also are of particular interest to me. Most of them are features of methodology, but a discussion may convey some idea of the arena too. Also, perhaps, I can already provide some glimpses of the future deployment of the programme.

(1) Participant search

One of the salient and obvious features of course is that solutions to problems as conceptualized, here, will not be easy to implement and maintain. They depend on processes of interaction, and must be able to weather many disturbances in the information environments. Therefore, one cannot avoid the fact that appropriate modes of observation, experiment, remedial action must be participant, contrary to what is the case in other parts of science. For sure, a measure of impartiality must be maintained by avoiding particular societal dogmas or particular ideologies. Or, putting the matter differently, if bias exists, then it must be kept outside the problem and surely must not appear in the solution process, if any, proposed. Nowhere however, can one maintain the stance of the impartial and external observer, as is proper elsewhere.

As a matter of fact, we are in much the same position as the experimenter in a Piagetian style interview, excepting that we are not developmental psychologists, finding out how children learn and conceptualise. We are adult experimenters, experimenting with adults, who are experimenting with us. Hence, we must face the task of reserving some mental space to accommodate observation of

ourselves as part of the interview. It may be significant that the adult is an even more recent invention than the child.

In brief, we are dealing with actors, individual people or societal actors, only distinguishable by way of their cultures and subcultures, and their interactions. If we claim to be of assistance, with respect to problems, we cannot avoid being actors in the drama of their interaction. We must be participants - hypothesizing, scheming, testing, experimenting, prototyping, protecting our own interests - but still participants. Even as participants, however, we can be formal when developing the transition links between the languages that the various actors and we ourselves develop.

(2) Viability of solutions

As solutions will usually be interactive processes, with costs (and hence loss of quality) to at least some actors, a continual problem of maintaining quality arises. This involves more than a measurement problem. Quality can be quantified, even metricised, in many different ways at the theoretical level. Yet, in a good sense, the practical quality of a process, especially, I suppose, the particular process I am going to select, is manifested by the ability of a high quality arrangement to maintain the process in question, however it is treated theoretically.

I shall concentrate upon one kind of "maintenance", i.e. maintenance of the quality of interaction. Here interaction is seen as an ongoing process in which a language is maintained in existence, a language that really works, is designed and sustained with a nature, a character, such that it can be used to bridge the gaps between the various actors engaged in solving some problems - e.g. the gaps between model builders and model users. To an appreciable degree, such a language is dealing only with interfaces, for example to catalyse debate in an information environment and to encourage the act of knowing (very loosely, of "knowledge") and its representation, nowadays often with the assistance of computers. It is in much this sense that one major type of solution to societal problems is linguistic

in form. Much of the work envisaged and in progress in the OOC project is concerned with this linguistic form.

In designing collective support systems, for example in order to provide advice of a specialist kind (legal, building, health care) to clients, the general approach has been to construct a model of the clients and their problems. Often such models are constructed (and, it can be held, most efficiently constructed) in terms of a highly specialised, disciplinary language. Almost by definition however, this is an esoteric language, familiar to the model builders, but not understood by the users. Or more formally expressed, the model builders must make, due to the way they construct their models, an interface which gives a particular interpretation to the problems their model is meant to solve. Such interpretations therefore may be imagined to be, but often are not in fact, germane to the problems as perceived by the clients or the users of the support system. That is particularly so when the model becomes entrenched, due to conceptual fixity on the part of the model builders (who often invest considerable effort in making the model and are unwilling to change it). It frequently becomes even further entrenched when much of the model is realised as a computer program, which obscures its structure, quite generally, both to designers and users.

Under these circumstances a ubiquitous problem arises. The clients do not use the support system. They may even drop out of using it, by active alienation. Strangely enough, though not infrequently, they are "held to blame" for this (the operation of psychiatric support systems, for example, furnishes a host of familiar problems of this type). The fact is, of course, that the interfacing language and the implicit, preformed interpretation of problems is wrong, even though the model, in itself, may be a good one.

It would surely be no worse, and it might be much better, if potential users were allowed not only to interact with the model designers during the formulation and revision of the model, but also if their own creativity was mustered in support of the model maintaining operation. Without such interaction a 'loss of distinction' will occur

between the users (or equivalently, a variety reduction). This may be derived from the fact that the distinct problem formulations and domains of potential users are not participantly observed (rather than numinously, or externally observed). Clients will be treated as uniform, and alienated if they will not wear the uniform. The design forces the users to be less distinct than they wish.

The situation, in fact, is rather like the ungainly architecture, obtained by obsessive planning. Even so called "participatory" planning is to be deprecated, in the context where it means that some figures will be obtained by enquiries made in obeisance to the population, maybe quite honestly, but after that, "agglomerated" (I can think of no better word for the variously inappropriate and generally incomprehensible types of statistisation performed at the well intentioned whim of the planners). The paradigm case is a tower block or some other rigid dwelling (this is not a diatribe about tower blocks as such, they can be beautiful places in which to live. I am aiming at the quasi architecture produced as a result of ineffective external observation. The architecture of uninhabitable dwellings. The shed making, the container fabrication, far worse than any shanty town). One is all too familiar with the results. Fear, isolation, vandalism; eventually the uninhabitable blocks have to be blown up as death traps, unless it is possible to restructure them into a habitable form. Slums have something to do with overcrowding; much more to do with inhuman rather than participant design.

Without denigrating the expertise of model builders, the injection of diversity from users of different types in different domains of action will surely benefit the system and its continued use. To conceptualise such interactive injection of variety we may speak of a conversational and participant mode, one which allows a support system to be improved by clients, using it. This point becomes particularly important if the interaction is mediated, in part, by calling in modern technology to establish a working interface (as is likely if the model is embodied in a computer program, no doubt one that is used by experts but also by users).

Roughly, such a "working" interface, with a "working" interface language, is one in which the quality of the interactive dialogue can be maintained, so that what is set up as a conversational interface does not degenerate into, for example, an interface for the communication of data (often inappropriate data). Such maintenance is an active, ongoing process, to be based on specially designed interaction languages. The latter therefore are crucial in the design and operation of such systems whether they be in psychiatric aiding, adult education, business management, or social welfare.

(3) Mobilising resources

As problems are linked to actors, each solution implies some costs to another actor, or more generally, will require the mobilisation and reallocation of resources to create a new balance. Often this balancing is taken literally. It is supposed that resources (brain power, computers, money, or whatever), used in one solution process, will become unavailable to other enquiries, which will, as a result, be deprived. That is a general belief. However, this need not be the case. Prof. de Zeeuw uses the example of wealth, where it was once believed that if money was so distributed that some people became rich, then other people would become poorer (a belief worked out for example in the extremes of mercantilism). In the long run, that turned out not to be the case, insofar as production resources were developed which led to the greater wealth of the whole society. Obviously, that was fortunate. But it is necessary to seek for mechanisms that ARE propitious.

Let me give another example, somewhat more inside my own immediate experience. There is an undeniably sad cutback in educational resources, in my own country as well as in the Netherlands, and others. Such a cutback may, or may not, be unavoidable in the context of a decline in the global economy. However, we may admit that whilst many results of the cutback are deleterious, some are not. There is increasing emphasis upon adult education, upon the admission of mature students to universities, simultaneously with the development of a culture in which what Illich and

Richmond have called lifelong learning is a valuable and joyful part of life.

One happy feature of adult education is that it lays emphasis upon "learning to be" something or other (manager, practitioner, mathematician) rather than "learning something or other" (management, practice, mathematics), with all the trappings, usual in schooling, or even in vocational training, of a fixed curriculum, syllabus, and so on in the given "subject matter". It also involves the salutary process of "learning to learn". This development certainly is propitious; it can guarantee to some extent that any process of balancing will command ever richer resources.

(4) Decoupling concepts

Methodologically there are several ways of dealing with situations where there is competition for resources. A general procedure is by "decoupling" the activities of the actors involved. Once more, I first use an example of Prof. de Zeeuw.

Consider a potential bottle-neck situation on the highway, for example, the situation at a crossroads. If there is little traffic, drivers can avoid the bottle-neck by ordinary sense and courtesy. At a later stage, if the traffic density increases, a policeman and a rule of precedence is needed to decouple the opposing traffic streams. A less expensive, possibly more efficient, system might employ the rule embodied in traffic lights, or computer controlled traffic lights (keeping the policeman in reserve for moments when these lights need repair). All of these are decoupling expedients. It is only the extreme case where it is necessary to build, say, a flyover bridge.

Yet all of these more-or-less costly, expedients, have the aim of enriching a usable interaction language. Let me add an example of my own. Recently, and not too expensively, there has become available a programming language for computing machines, namely, "HyperTalk". It is part of a system called "HyperCard", and is due to Bill Atkinson and his sponsors, and is rightly redolent of Ted

Nelson, and "Hypertext", and the Xanadu project. It also belongs to that long series of approaches with which to reorder what we are doing, and thereby find a new and different balance for the way we use the resources of our body, mind, experience and creativity. Other elements in this series are the slide rule, the credit card and the shoe horn.

The principles of HyperCard are simple. It orders activities in terms of writing cards and of their links. In essence therefore it employs methods no different from methods in everyday use even when dealing with the chores of housekeeping. But HyperCard makes this idea into a practical and useful metaphor, into something that can be used with ease and elegance in many different situations where normally we would not use writing cards. In spite of its simplicity it has remarkable power. In fact I recognise that we have gained in the "HyperCard" technology an amplifying tool for the information environment which I believe to be crucial, pivotal in our research, and of immense significance. It furnishes a means of solving problems in the way the pervasive bottle-neck problems are solved by building flyovers.

I won't go too deeply into the technical specifications of HyperCard, having presented my example to the full, it seems. But let me use the example as a reminder for another story, related to the fact that even I can use HyperCard. This is to say little, but also a lot. My early experience in computing was partly with a machine called "Deuce", having 4 kilobytes of "storage" (I won't say "memory", on principle, because it isn't), and that much in the form of mercury delay lines (as I recall it, about 25 bytes, in the current lingo, of directly accessible storage attached to the central processor, or finite state machine moving and writing upon the imaginary "infinite tape").

Of course, I'm a bit acid and old fashioned about these things, since I went out of date at the inception of the Manchester Autocode. I'm also in something of a chagrin, which I will not disguise, for we had analogue and hybrid machines, larger in size but equal in performance to the connectionist and the N cube and the "artificial neural

network" jobs, now made so popular in San Diego, and know, perfectly well, how to train them, because you did not EXPLICITLY program the things. However that may be, I'm glad to know that HyperCard makes it possible again for me to program, standard computing machines. Regarding the networks and plexi, some of the devices that my colleagues (mainly) and I (as, for the most part, a philosophical experiment), made and published some 35 years past, need to be reinvented, although some of them have been.

To be honest, there really is a general lack of acknowledgement, in connection with the well publicised recent developments, for much earlier work treading the same ground; for example to Roland Beurle, Heinz Von Foerster and Cecil Gwinn (who indirectly funded their efforts through Oesterichers BIONICS programme, which was of comparable status to our OOC programme, though had different goals). And to others, like Rowena Swanson, who maintained a college of researchers, in much the same field, but with resources stemming from a different agency. They all contributed to reaching the critical mass that makes it possible now to have at your fingertips the 2 megabytes of RAM storage, that are necessary to do something as simple as to link cards and to restructure an information environment. And to turn the arcane apparatus obeying a Church, Markoff, Turing, Von Neumann algebra, into something that people can use, appreciate and make beautiful things with.

(5) The information environment as a resource

A social system sticks together with glue made of common beliefs and attitudes. It has unity. Such unity may be designed (in a participant manner), or may simply arise from the interaction of actors to form larger actors, cultures and subcultures. To foster interaction is essential. Mostly, however, it is not sufficient. It is also necessary to promote, to catalyse, to differentiate or, even, to inject distinction to balance the becoming of coherency in the system. All of this is encompassed within the scope of a half perceived, but very real, reality. That reality is the information environment.

I believe this type of environment is the pivotal element in the OOC research programme for it has the effect, perhaps amongst other effects which I do not appreciate, of amplifying the various dynamic productions and reproductions, often in quite an unusual manner. A culture is healthy only insofar as it preserves, nurtures, and feeds upon the variety of distinct subcultures or distinct individuals. Often these are deviant and minority groups, occasionally ethnic groups, even professions.

One of the main lessons here is that we have to allow each support system to do what it will do, anyhow, that is, specify its own boundaries, which we, as scientists, should respect. This will prevent the loss of distinction, and preserve the richness of the information environment.

3 CONTRIBUTIONS FROM CONVERSATION THEORY

To summarise, the general type of solution (interpreted as an ongoing process), to the problems we face (taking problems to mean disquieting situations, requiring formulation, resource commitment as well as solution) will be linguistic. The construction and the maintenance of languages of the kind noted in the context of a collective support system, that is, languages of whatever kind and in whatever modality that comprehend diversity and foster interaction, will occupy much of the research effort. It is important to note that, often, these languages will implicate computing systems as well as human actors.

One general objective of the OOC programme is to construct a generator of such languages and to embody the languages generated in different ways. That is a large, entirely possible, entirely non-trivial, in fact, essential task. One way of doing so is by way of the concept of conversation. Conversation is based on linguistic exchanges, and in a sense is itself therefore a generator of the languages involved. It is this line of conceptualisation along which I will direct my personal contributions to the OOC research programme. It should be noted that the programme is designed to house other conceptualisations as well, and to sometimes turn their strengths and weaknesses against each other.

My contributions will involve mainly the protologic, L_p , as used for representing and manipulating shared concepts and their relationship in conversations. This involvement will surely lead to applications tailored to specific OOC projects. Also, I hope, it will give rise to developments in or revisions of Conversation Theory triggered by the problems we face in these projects.

(1) Conversation Theory

I shall outline first what the theory is about and second indicate some

of the ways in which it is relevant. Conversation Theory grew up as a body of hypotheses, often focussed upon social, psychological, or educational matters. These matters arose out of my work of 35 odd years, dealing with a curious mixture of mechanical, philosophical and human issues - such as for example (mostly deviant) computing systems, social support systems (including that most important social support called entertainment), human machine systems for training, maintaining vigilance or workload, learning concepts and skills, police organisation, selling, innovation and decision making, by people or by small teams. It became clear, chiefly in the context of educational support, that the existing paradigms were insufficient. Hence, Conversation Theory grew up, albeit slowly.

Its inception was due to my colleagues and myself about 20 years ago. I was lucky to be in a central position during this period - at System Research and at other institutions. Consequently, I can speak with confidence of work which has been done by many people,

Perhaps the fundamental insight here was that a conversation is not, as it is not infrequently supposed to be, data communication, let alone a means whereby one participating actor can control another actor's behaviour. The main point of Conversation Theory is that conversation is the converse of control. It leads to deregulation. For sure, concepts are exchanged in a conversation and often some public concept is shared. Indeed, your personal concepts and my personal concepts are likely to be enriched. But your personal concept of something is not identical to my personal concept of what we (may choose to call) the same thing, and the conversational exchange, even in the case when some public concept is shared, may just as well lead to enrichment by divergence (of our personal concepts) as to convergence (of our personal concepts).

These underpinning notions are important in the sequel, because they give fresh meaning to commonplace terms. I shall speak of "information transfer", for example. But with the caveats given, this is not just the "information transfer" of communication theory (as might be supposed if a conversation were thought of just as a

communication process). Something like mutual comprehension, of coherence between the participants must be included. I shall call this "agreement", but, given the underpinning interpretation, an "agreement" is seldom a complete accord. The technical use of this term should be taken to include "agreements to disagree", appearing, for participants A and B as self and other referential statements like "A's view of B's view of ... T", where "T" is some event, or "object".

In fact, education, in contrast to schooling, is only possible insofar as the teacher learns as much, or more, about the learner than the learner is supposed to learn from the teacher. Agreement, again, includes agreement to disagree, by far the commonest outcome, and the most productive if accompanied by mutual responsibility. Conversation can and often does give rise to conflict, but it also leads to conflict resolution when there is mutual respect.

The events of a conversational interaction are concept exchanges, on occasion producing shared concepts or public concepts, often represented in Lp. It is convenient to call concept sharings by their common name of "agreements" but to emphasise that "agreement" is rarely a complete accord

What do I mean by a conversation? Well, first of all a conversation is an active linguistic interaction between actors, namely, the participants (such as you and I) by whom personal concepts are exchanged and, in part, shared. The shared concepts are dubbed as public concepts and are exteriorised, together with their interrelations. It has turned out possible to represent these concepts and relations in terms of a protolanguage or protologic, namely the Lp, which I tied up with Conversation Theory, when this phrase was first mentioned. Such concepts and relations can be manipulated and the results of this manipulation presented, for example, to the participants as suggestions, proposals and the like. As an aid to these tasks suites of computer programs are useful, in practice they even are essential tools.

A "conversation" is rather more than any old chat between you and

I. In the first place, the language used by the interacting participants need not be, and often is not, verbal. It may be graphical, for example, or else the language of pantomime or of symbolic behaviour. It must, however, have the power of a natural language to express commands and questions, obediences (or not), answers, requests; stories and metaphors as well as descriptions and assertoric statements.

Lp is called a primitive or protolanguage because it lacks the refinement of particular natural languages but, even though its phrases are symbolic behaviours, it does have the essential qualities of a natural language. Present day computer programming languages lack these natural language qualities, unfortunately, however powerful they may be (see note *2).

Of course, the "participants" in a conversation need not be people, like you and I. Conversations, if you like, conversations in the technical sense, take place between well established and partly autonomous conceptual organisations in one head (as when we see ourselves in different roles or weigh up the merits of different hypotheses). Again, there are conversations that go on between people and cultures (where groups of heads subscribe to a cultural norm, a system of belief) and other conversations that go on between culture and culture. The languages in which such societal conversations proceed are seldom comprehended by the individuals involved, though they may act differently as a result of the debate. At the most, these languages are glimpsed by "brilliant managers", in industry, or "inspiring leaders", in religious movements.

It seems crucial to me to realise that these conversations between different types of participants are rendered more numerous and that their effects are vastly amplified by the information environment in which we currently live. The information environment is a real feature of the OOC programme, and buttresses its significance in our world. At this juncture the relevance of Conversation Theory to the OOC research programme probably is becoming quite evident also. After all, the programme is concerned with the actions and interac-

tions of actors, individual or societal actors, and with language in general. However, I would like to pursue the matter further and indicate some of the deeper points of relevance, particularly as they relate to concepts, as the tools of conversation.

(2) Concepts

What do I mean by a concept? Either the personal concept particular to a participant (your concept of "education", say, which may be very different from my concept of "education") or shared and public concepts bearing a similar label. Not too contentiously, a personal concept is applicable BY a participant. It is a bundle of coherent (logically sticking together) procedures capable of being applied as a process in order to produce a product; this product may be an image, a description, or a behaviour, often all of them. There is, in fact a process-product complementarity. If one exists, then so does the other.

Again, I am unlikely to arouse much objection in stating that personal concepts have inherent stability, that groups of them become conceptually fixed. Sometimes they become entrenched or ossified. Sometimes they grow by relearning and evolve, become enriched. My specific claim is that these properties are due to the continual production of concepts from other concepts, and, incidentally, to their reproduction.

Production and reproduction follow the action of operators, having the same form as concepts, upon concepts. There are innumerable many operators of this type and whilst there is no way, in principle (an indeterminacy principle) of counting them we may distinguish between indefinitely large categories of them, just as we may distinguish between participants, and may do so in any number of ways. Here, there is another fundamental complementarity. It is a complementarity of concept and the productive system (of concepts) in which it is necessarily entrained. It parallels (but is not quite the same as) the earlier process-product complementarity, of concepts themselves.

(3) Closure

One way to distinguish between participants is as follows. Some years ago I dubbed this process "Psychological Individuation". It amounts to delineating what Humberto Maturana and Francisco Varela independently called an "organisationally closed" system, in this case a conceptual system which is productive, amongst other conceptual products, producing its own productive conceptual operators. Since participants may be many things (cultures, coherent organisations meeting in conflict and being creative by resolving that conflict, institutions and systems of belief) it is often more appropriate to think of a "socially individuated" system. That, also, has organisational closure.

I think that Maturana, Varela and I came upon the idea independently but it is hard to say, since all of us owe so much to Heinz Von Foerster and his work. In any case, we have shared our notions so frequently, that there is no way of telling. Incidentally, Glanville, when he insists that an object entails its observer (which is relevant to our treatment of objectivity, later) forms an observer closely related to a psychological individual. It is quite a critical point that although an observer may choose to distinguish these psychologically or socially individuated entities in any number of ways their individuation means that they are also self-distinguishing, marking-out the boundaries which give them integrity. If that were not so, it would be difficult to support participant observation and search, as I do, as a hard nosed, far from sloppy methodology.

Before using "organisational closure" (or its near equivalents) as a unifying principle (which knits Conversation Theory into a congruent and invariant collection of entities), it is worth restating what "organisational closure" is. An arrangement is organisationally closed if there be some fabric (biological molecular, conceptual, social) upon which productions (enzymes DNA, productive concepts, productive social operations) act to produce products. AMONGST these products are the productive operations. Living organisms, the cells of living organisms, ecologies composed of organisms are like that. So are participants, actors and the societies

they inhabit.

Let us now return to the form of Conversation Theory. Its durability, which allows it to evolve, is due to the specification of certain entities related by changeable rules but having a measure of permanence. This permanence may be stated as follows.

A concept is organisationally closed, a coherent collection of concepts is organisationally closed, a participant is organisationally closed. There is, I claim, a universally conserved action leading to coherence. Why do concepts remain, instead of sticking together in some amorphous mass? I assert (so do others) that an exclusion principle is operative here. Whereas a concept may be (and usually is) produced by many paths, whereas the application of many procedures may lead to one product (think of a concept, skill if you wish, like riding a bicycle), the same concept, as a process, may NOT give rise to distinct products, nor will a conceptual production system yield ambiguous products. An ambiguous product would be a concept which had lost its original distinction and the claim is, really, that distinction is preserved by coherence.

The underlying exclusion is not a claim that such potentially ambiguous productions cannot or do not occur. It IS a claim that when they do occur, conflict is generated and that this conflict is resolved, in an organisationally closed system, for example by the introduction of distinction, so that the products appear as distinct novel concepts (arising, in fact, from the interior of the original concept which remains viable). In particular, the distinction of participants who interact is conserved, or increased, by the coherence of exchanging concepts in a conversation.

It follows that a psychologically individuated, or socially individuated, or, equivalently, organisationally closed participant must be a system with one other characteristic, at least. The participant is organisationally closed but "informationally open". A participant is able to converse, willing to attend, give and receive, to enter into coherency with other participants, in short, to converse. Maturana,

who formed his ideas primarily in the field of biology, prefers to call this property "structurally open" and the conversational outcome co-ontogeny. These phrases capture much the same meanings, those of synchronicity and coupling, albeit partial.

The core of conversation is represented by a Petri type information transfer, even though a few aspects of it are usefully reflected in the elegant tradition of Ashby or Shannon type information measures. Information transfer, in the primary sense, is, I postulate, one other conserved quantity of conversations taking place.

(4) Conversation and science

Why study conversations rather than, for example, behaviour in general? Indeed, much of present day social science has a different orientation, taking the "subject" (something like 'a body' or 'an institution') as an it-referenced "object", determining its behaviours or groups of behaviour externally and trying to explain what is inside the "black box" of a "subject" with inputs and outputs, either in terms of drives and reinforcements or of the computer models of cognitive science. Wouldn't conversation be just one of such classes of behaviours?

There are several replies to this rhetorical question. First, there is a pragmatic reply. Detailing the paraphernalia of Conversation Theory provides a reasonable chance of dealing with problems of the type encountered in the OOC research programme. Consider, for example, the formulation of participants (or users of support systems) as organisationally closed and informationally open systems. This formulation seems to capture precisely the problems actors, societal actors, and coalitions of actors using the languages of different kinds face in their self-created information environment. Their activities are not behaviours in the sense of changes that are determinable by an external observer. Neither is the flux of conversation, although it may be called a special kind of behaviour, that is, mutual behaviour.

Next, there is an epistemological and scientific type of reply. It has to do with the distinction between "hard" and "soft" sciences. Often people call disciplines like education, psychiatry or social science "soft sciences", referring mainly to their content. Yet, in my view, the distinction has only to do with whether or not there is an adequate approach. Thus, it seems to me, the behavioural approach to conversation can only lead to "soft" science, given the unfulfilled condition that the phenomena of conversation be isolated by an external observer. Their isolation is only possible in the process of another conversation, in which the researcher is a participant. To build up a "hard" science one will need an adequate logical, epistemic and interpretational structure for the theory being developed (recalling, of course, that a theory ceases to be a theory as soon as its parts are closed to refutation by adequate ("hard") data and also insofar as it cannot evolve). I claim that Conversation Theory deals with hard social, educational, psychological events, that its conceptual approach is adequate and that hence the domain of social science within its compass is a "hard science". The behavioural approach does not give this promise.

Let me enlarge somewhat more on this claim. If the conversation takes place at a computer regulated interface which contains an implementation of the protolanguage L_p (in fact, in this case a manipulative protologic, also) then an L_p representation of shared concepts and their relationships (of coherence of various kinds, of analogy, generalisation, local negation and so on) form "hard data" about the conversation going on, and about the changes and exchanges involved. Via the interface a conversation with the researcher is built up, and hence an agreement about what is part of the conversation can be reached at all times. The interface, in fact, plays much the same role, in this case, as the cloud chamber in physics. Insofar as protological inferences and proposals provoke information transfer and promote or catalyse conversation (which is usually possible) they play a role akin to the accelerator in physics.

In adult education, for example, an agreement over an understanding of some concept, which is elicited by formally examining replies

to "how", to "why" and to "what" and "who" questions over a body of Lp related concepts can be made into a very hard event. The usual difficulties about whether or not this event represents some "real" internal and subjective process, or in the sense that it cannot be isolated from other events, are rendered irrelevant. In general, any agreement is elicited by the iterative refinement of meaning to the participants, both in their conversation and in the conversation with the participant observer. It will have a coherence truth value in the sense of Reschers later work or, in the very precise sense of Taylor and Gregory an hermeneutic truth value.

In summary, the data of Conversation Theory are of a different kind to "standard" and "objective" data. Strictly speaking, agreements and the like are intersubjective refinements of meaning. But the process of refinement makes them just as "hard" as the data of mechanics, biology, or physics. Moreover, they are just as open to formalisation. But it is a formalism of a different nature, of what Prof. de Zeeuw calls a double level nature, involving modal logics such as those of Von Wright, Braten, Hellerstein, Greenblatt, Spencer Brown, Kauffman and Gunther. These logics have quite complex lattices of distinct kinds of truth value, basically, logics of distinction (various sorts), coherence (various sorts), self reference and other reference, technical imperative values and social imperative values, together with event structures appropriate to systems that are organisationally closed and informationally open.

The operating calculus built into an Lp interface processor is not, at least at the moment, as rich as these logics. It contains an operation of execution which faintly images the operation of concept application such that each image models concepts in a restricted manner. However, in practice, even these restricted forms are already of great value and will, no doubt, be developed considerably in the future. Quite a number of implementations already exist, over and above the special purpose equipment used in 1973. They are due, for example, to McKinnon Wood, to Paul Pangaro, to Charles Small. New implementations are under development by Gert Hulstein, Rolf Pixley and others in the context of the OOC research pro-

gramme.

These comments should not be interpreted as a plea that one approach is better in general than another. It only indicates that whatever method one uses, if applied in the wrong environment or with the wrong instrumentation, one will get "soft" results. While very different, both are appropriate to specific regions of endeavour.

Conversation theory is a precise method but it is concerned with PARTICIPANT, NOT EXTERNAL (as is the case for other areas of science), observation of events. It is this feature which, amongst others but perhaps above all others, renders it appropriate to the goals and intentions of the OOC research programme. If used in this context, then it, or something like it, will emerge as an advanced, evolved, insightful product of the research group. Obviously, I hope to witness and participate in this evolution.

picture, which I have only begun to indicate.

4 RELATION TO WORK ELSEWHERE

The present state of things is particularly challenging because it is related to work in progress throughout the world. It is no exaggeration to say that we are participating in a "new wave", and in an important "new wave" of research. Those also involved are widely dispersed, geographically. A significant by-product of the OOC research programme can be to act as a means for coordinating this work.

Let me indicate some of the efforts that make up this new wave. In the United Kingdom, for example, there is research on the architecture of knowledge at the Architectural Association and, in a somewhat different vein at Portsmouth Polytechnic; upon human machine and human interaction at L.S.E, in Edinburgh and at the Open University, where very different, more global matters, are addressed by the Cooperatives Research Unit. Elsewhere in Europe, for instance in Lisbon, Oslo, Brussel, Paris, Genova, Vienna (to cite only some of the more important locations), research is in progress upon subjects intimately related to and through the OOC programme; for example on social learning, consciousness, the representation of knowledge and belief, the interaction of styles adopted by different subcultures (an incomplete list of topics, sufficient to indicate the flavour of the field).

But when I said "throughout the world", I meant it. For, to my own knowledge there are relevant projects ongoing in the U.S.A, Canada, the other "Americas" (in Chile, work on properties of closure), in Israel, other parts of the Middle East and in New Zealand. As a group we are aware of more, and more diverse but still relevant, work elsewhere.

Clearly, I am most familiar with my immediate specialities; Conversation Theory, Lp, and Cybernetics as a philosophy. There is a larger

5 PLANS

My plans are, as seems wise, flexible. Apart from pursuing some personal, although I am convinced relevant, interests such as the development of Conversation Theory and Lp interfaces, they are as follows.

There is a brace of problems, that require further study, part of which seem to belong consistently to the history, ancient and recent, of andragology. These have to do with issues regarded, in their day as as either peripheral or the province of the ladies and gentlemen bountiful (occasionally called philanthropists). The general question was, and still is, why these folk, or others with more to do and less money to do it with, should be bothered at all.

Who cares, for example, if a person is destitute? Maybe in such emancipated parts as Portugal or Africa the family cares. Well, very nice, fine and dandy. Why does it matter if youngsters or oldsters act out their anguish in a gutter, degenerate to animal form in some school-like institution, or resort to methylated spirits in skid row? Why does it matter if the enlightened philanthropists, Presidents and Potentates, adopt the facile, bureaucratic, grand solutions offered (with the best intention) by their technocratic minions and make this world more of a hell than it already is? Why does it matter if a genius, like Oliver Heaviside (Weiner recorded the story himself), is forced by benign connivance into misery (whilst Pupin, a man of minor consequence, gained temporary prominence and permanent disrespect)? Does it matter at all if progress, more and more of the same, goes on; if innovation is stifled, excellence rolled flat as tarmac, and beauty drawn into a black hole, mediocrity?

No malice is involved, so far as I can see, just ineptitude. Who cares is, however, an important question to be answered by a so called caring society that spends so much effort in keeping the living dead

alive and mutilated brains as pathetic monuments to medical science. In a certain sense it is important to answer the question in a rational manner, in a manner based for example upon a properly structured science, like andragology, with adequate foundations.

At any rate, that is what I see as the main challenge of the moment, to refine to some extent our knowledge of, and our competence to deal with changes in the information environment. On the one hand, I do believe in the value of people and their civilisations. On the other hand, I appreciate that the sheer complexity of the problems facing them by way of education, promoting creativity, removing the straightjackets of well intended bureaucracy is such that extraordinary measures are needed in order to generate understandable languages, by means of the language generator which is a primary objective of the whole programme.

No single discipline can handle such extraordinary measures on its own. That is one of the reasons I find myself so elated to find in Amsterdam so many people interested - in the department of andragology, but also in the new Faculty of which this department now is part (the Faculty of Educational and Andragological Sciences), and in the SCO (Stichting Centrum voor Onderwijsonderzoek). I hope and expect to work together fruitfully with all of them, or to continue to do so.

That up till now I have not mentioned the students at the Faculty is not by intention, but more for pragmatic reasons. I have met mostly only with students of what is called here - at least up till recently - the "second phase", that is with Ph.D. students. Next, it is my strong belief that science is not a question of students as opposed to researchers. When I talk about researchers I also mean students in the standard sense. For all of us are students, some older, some younger, some alive, some willing to start each day anew. I hope however to come into contact with more of those that care for insight, for straining to one's utmost to become clear and effective.

Of course, I will be deeply concerned with my own work plan, with

the architecture of social and individual becoming to know. I am greatly concerned with creativity, design, learning and above all, perhaps, with the form of intra- and intersubjective and social consciousness. I am anxious to develop my own theoretical stance, at the moment of Conversation Theory and Lp, but that interest evolves. It will be exciting however to interact and converse with many other researchers (older and younger). I hope my efforts will be of mutual benefit.

Over the years I have met quite a few of the people working in the institutes mentioned. In a sense they all helped me to accept the invitation as guest professor. I would like to thank them personally, and I will, but not now. You may all wish to refresh yourself at the reception, having listened so patiently to all these dry statements about participation, conversation and interaction. In this way, let us make these topics more active, more live.

I would like to make some exceptions, however, to those many whom I will not thank now. There is Prof. de Zeeuw. His motivation and drive are well-known. They have been instrumental in my appointment here. But most especially I want to express my appreciation of working together with someone who has produced such deep and often unsettling insights in social science and social change. And there is Gert Hulstein who has hosted me most graciously, and who has demonstrated to be one of the up and coming young men - though it is not quite clear yet in what direction.

Thank You.

NOTE 1

The information environment is considerably more than the resources furnished by modern breakthroughs in computation and telecommunication, although these resources are tools that give leverage and amplification which render the information environment more powerful and all pervasive. The really important feature of the information environment is the use which is made of these facilities.

In England, for example, there is a tradition of the English "Pub", in the sense of a "local", where people of all subcultures, wealths, ranks and walks of life are inclined to meet and engage in debate. The pub, in this sense, is not JUST a "bar"; it epitomises the information environment (as squares, plazas, and the foyer at the opera do in other civilisations). Today, "the world is our pub", if the technologies are used for that purpose (I use the metaphor in terms of language USE, rather than a world-wide network of beer tubes and wine ducts).

The languages used are often not verbal. You can obtain personal privacy, for example, by scrutinising some letters. You can obtain debate amongst a group by employing the jargon and gesture of the doctor, parson, squire, and labourer; those hoary symbols of roles in village life. But there is also an interlingua of speech and attitude in which all of them, doctor, parson, squire, and labourer converse in forms of discourse, cabaret, and oratory.

NOTE 2

This statement requires some important, if technical, qualification. First, the work of Flores and Winograd is, as lucidly pointed out by Gregory, in much the same spirit as our work in Conversation Theory and, so far as computers are involved, in Lp. Next, there is a recent technical report by Bricken et al, in which they delineate a "Boundary Logic", based upon a Spencer Brown type of "Distinction Logic", which, whilst independently developed, accords with the distinction of collective and distributive forms in Lp. It is not yet

clear to what extent there is a similarity between the boundary logics of Bricken et al and the Lp calculus of analogies and generalisations, the anatomy of which resembles that of "Catastrophes" in the "Catastrophe Theory" of René Thom and the complementary dynamics of which resemble families of "chaotic" attractors (for example, those worked out by Mandelbrot, Chernikov et al, Peitgen et al), or "chaotic" dynamic equilibria.

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