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INDIVIDUALS FORM COMMUNITIES -- COMMUNITIES FORM INDIVIDUALS

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ABSTRACT

In a number of papers I have analysed the process whereby an individual models the world and have used George Kelly's concept of **personal construct systems** underlying man's epistemological activities to present the individual as a **personal scientist.** I have operationalized part of Kelly's theory through computer programs that elicit personal constructs interactively and analysed the construct structures in a variety of ways. However, one of the problems of a conventionalist epistemology such as that proposed by Kelly is to explain the way in which people do come to have common constructs and are able to communicate with one another. If one takes Kelly's viewpoint to be epitomized by the concept of man as a personal scientist then it remains to explain how worlds can arise in which individuals can reach agreement on a common view of a topic or on co-operative programs of action. This presentation outlines a model of the formation of **worlds of knowledge** which integrate Kelly's conventionalist epistemology with the normative epistemology of Popper's concept of **world 3s.** It is also related to Klir's model of the **epistemological hierarchy,** Brown's **logic of distinctions,** Pask's model of **Psychological Individuals,** Wolff's concepts of **surrender and catch,** and Gray's notions of **system forming precursors.**

INTRODUCTION

In a number of previous papers I have analysed the process whereby an individual models the world and have used George Kelly's (1955) concept of the personal construct systems underlying man's epistemological activities to present the individual as a **personal scientist.** I have operationalized part of Kelly's theory through computer programs that elicit personal constructs interactively (Shaw 1980, 1982) and analysed the construct structures in a variety of ways (Gaines & Shaw 1980). Logical models of construct systems (Shaw & Gaines 1979, 1980) have also been proposed that relate them to Zadeh's (1976) fuzzy semantics and to the structures of fuzzy (Zadeh 1978) and generalized (Gaines 1979a) database systems.

In epistemological terms Kelly's **constructs** form the **source system** at the base of Klir's (1976) **epistemological hierarchy,** essentially the **domain of discourse** (Gaines 1977 p.165) for the description of observations of the world. Kelly emphasizes the personal nature of the source system for individuals and hence, in Klir's terminology, of the **data system** presenting actual observations of the world, and the **generative** and **structure** systems above it in which these observations are modelled. This is in contrast to conventional epistemological systems that suppose that some impersonal universality at all these levels is a hallmark of knowledge.

Thus, a key problem for a conventionalist epistemology such as that proposed by Kelly and developed in previous papers is to explain the way in which people do come to have common constructs and are able to communicate with one another. From a positivist point of view there should be only one epistemological hierarchy. When we accept the liberalization of this to a plurality of such hierarchies we allow for the real-world phenomena of different **points of view** and different **worlds of knowledge.** However, we then have the actual communality of much of our knowledge, language and modelling systems to explain. If we accept the concept of man as a **personal scientist,** then we also have to explain how a **world of knowledge** can arise in which individuals can reach agreement on a common view of the world or on co-operative programs of action.

This paper outlines a model of how individuals form communities and communities form individuals which integrates Kelly's systemic epistemology with the system theoretic approach of Gearge Klir's hierarchy of knowledge and its psychological interpretation by Shaw and Gaines (1981). It also links Kelly's work with that of Spencer Brown's (1969) **calculus of distinctions,** Gordon Pask's (1975) concept of **Psychological Individuals;** William Gray's (1979) **emotional-cognitive structure theory** for understanding the formation of communities; Kurt Wolff's (1976) concept of **surrendering** to a

community to **catch** its essence; and Karl Popper's (1968) ideas of **world 3s,** or **communities of knowledge.**

THE KNOWLEDGE HIERARCHY

Kelly (1955) emphasizes the epistemological role of personal constructs in predicting and controlling the world and their ontological status as personal conjectures rather than reality-derived absolutes:

> "Constructs are used for predictions of things to come, and the world keeps rolling on and revealing these predictions to be either correct or misleading. This fact provides the basis for the revision of constructs and, eventually, of whole construct systems." (p.14)

This capability to revize construct systems in the light of experience and the pluralism of possible construct systems was the basis of Kelly's **constructive alternativism** that we are not necessarily bound by our construct systems but can revize them to see the same problem from a new viewpoint.

At a fundamental level we can see Kelly's **constructive alternativism** as being based on the primitive operation that Spencer Brown calls **making a distinction.** Brown (1969) commences his seminal work on **Laws of Form** by noting:

> "a universe comes into being when a space is severed or taken apart...The act is itself already remembered, even if unconsciously, as our first attempt to distinguish different things in a world where, in the first place, the boundaries can be drawn anywhere we please. At this stage the universe cannot be distinguished from how we act upon it, and the world may seem like shifting sand beneath our feet." (p.v)

Thus, for both Kelly and Brown, all models at higher levels are fundamentally dependent on the distinctions made -- the constructs used -- at the **source level** of Klir's (1976) epistemological hierarchy.

The epistemological role of the construct system is shown in Figure 1 where Klir's hierarchy, rephrased in psychological terms (Shaw and Gaines 1981), is embedded in the personal scientist cycle:

events --> modelling --> prediction/decision/action --> events -->

In this figure the lowest level shows the **constructs** or the **distinctions** made in interacting with the world. The next level is one of the **experiences** of events which happen to us, and we make happen, in terms of the distinctions already made. Levels above these are **hypotheses** which are rationalizations of experience, **analogies** between these rationalizations and **transcendencies.** Interaction with the world is, therefore, mediated through the construct system to produce experience which is modelled through the higher levels leading to predictions, decisions, actions again mediated through the construct system.

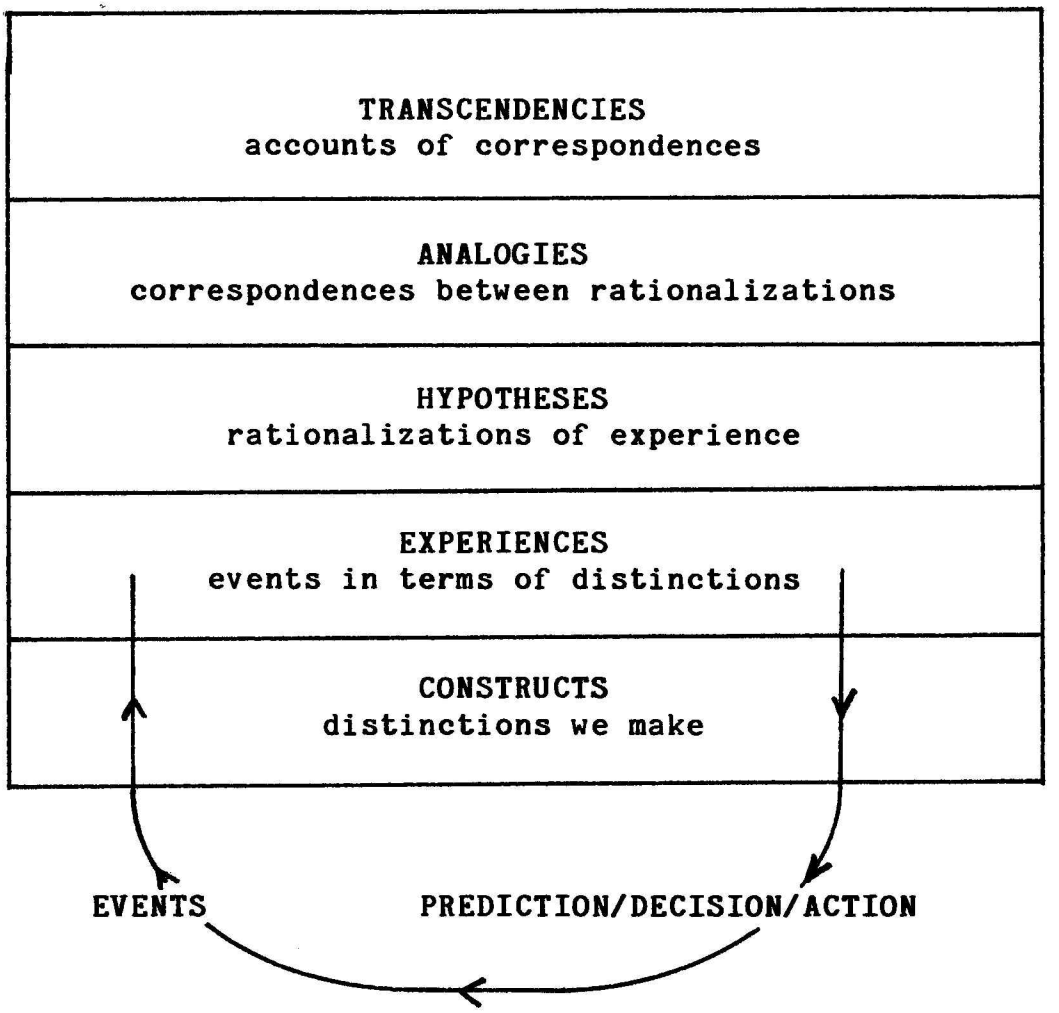


Figure 1: Epistemological Hierarchy.

PSYCHOLOGICAL INDIVIDUALS

Klir's hierarchy gives a system theoretic framework for personal construct systems. However, it also provides a framework for social construct systems if we realize that an individual's hierarchy may be seen as a cross-section through a cultural hierarchy. This is put more concretely by Pask (1975 p.302) who introduces the notion of a **P-Individual** or **psychologically characterized individual** in contradistinction to that of an **M-Individual** or **mechanically characterized individual.** He notes that an M-Individual is characterized as:

> "a human being (or his brain) as a biologically self-replicating system",

whereas:

> "a P-Individual...has many of the properties ascribed by anthropologists to a role, in society or industry, for example. A P-Individual is also a procedure and, as such, is run or executed in some M-Individual, qua processor."

He also notes that whilst **an M-Individual may support many P-Individuals,** i.e. a person may play many roles, it is also possible that **a P-Individual may be distributed over many M-Individuals,** i.e. a social unit may require the interplay of several persons.

The concept of P-Individuals as cross sections of epistemological hierarchies interfaced to the world through personal constructs gives a coherent systemic framework for the relationships between individuals and worlds, the ways in which individuals form social groupings, and societies form individuals.

Figure 2 shows John, a person with a number of roles. He has formed P-Individuals as a husband, a sales Vice President of his company, a backpacker and a fisherman. Are these roles just descriptive or can we give them deeper systemic significance? Personal construct psychology gives us a basis for this. The **personal scientist** (Shaw 1980), or process which is John as a husband, uses operators to make construct-forming distinctions. They are distinctions about perception, about models, about values, about action. It is with the formation of these constructs that a P-Individual comes into being. John uses different constructs when he is in the role of husband from when he is in the role of fisherman, but some of the constructs he uses in the role of fisherman are also used in the role of backpacker and we show this as overlapping P-Individuals.

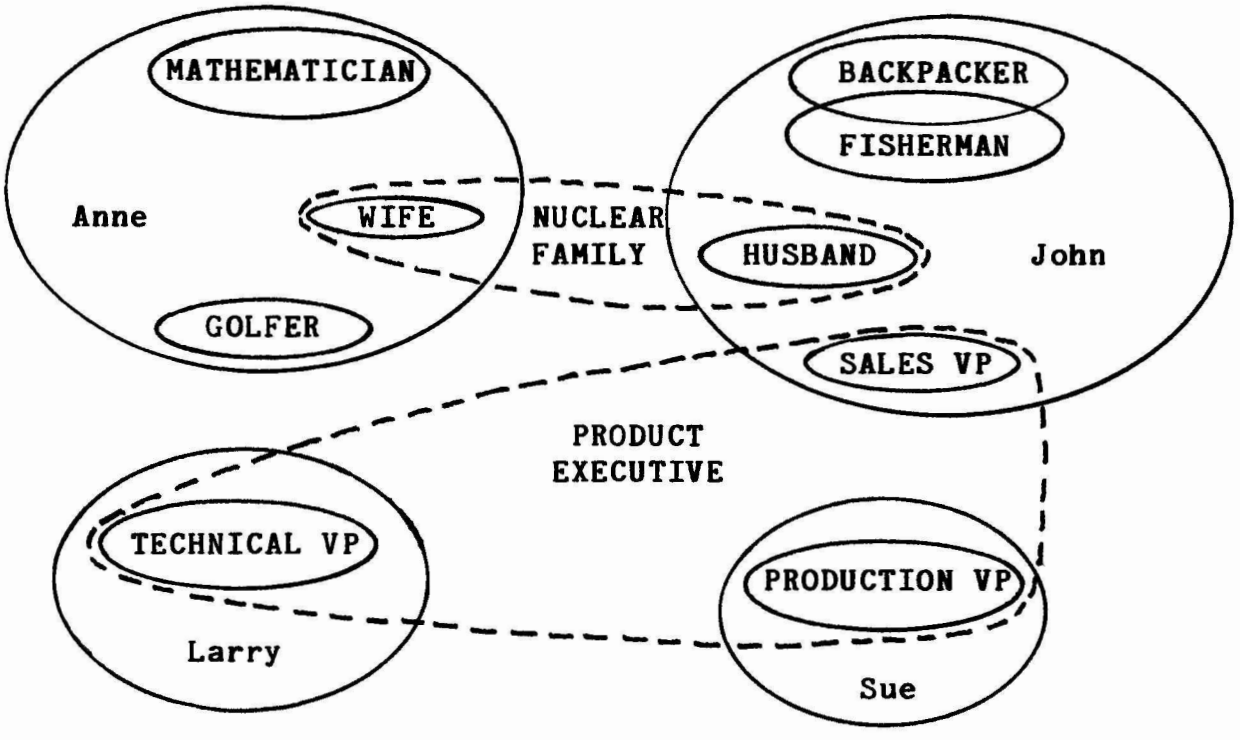


Figure 2: P-Individuals formed by Groups.

Figure 2 also includes some of John's associates. Anne is John's wife. She is also a mathematician and a golfer. Larry is the technical Vice President in John's company, and Sue is the production Vice President. Sometimes John is acting with his wife or colleagues as one P-Individual and this is shown by a dashed line. It will have constructs that are shared between participants and others that arise from only one of them. For example, John and Anne form a nuclear family (Shorter 1975). This is a P-Individual which has legal rights, specific behaviour, concepts and language which are not those of either part but are made up of both. The product executive of the company (O'Shaughnessy 1976) is a P-Individual which has authority, responsibility, behaviour, language which is unique to the entity and not that of any one of its participants.

THE FORMATION OF COMMUNITIES

It is fairly straightforward to analyse the operations of P-Individuals once they exist. Psychology and sociology have a solid systemic foundation in terms of the theory of personal constructs and

the calculus of distinctions (Gaines & Shaw 1981). However this leaves open the generic question of how such unities form. William Gray (1979) gives insight into this by pointing out the essential emotional component of system formation. He introduces his notion of **system-forming precursors** as part of his **emotional-cognitive structure theory** for **understanding creative thought processes.** He puts forward the view that emotions are integrating devices for the formation of thoughts and coding devices for memory. He notes that system formation occurs when precursors are brought together; activators initiate emergence of an organizing focus allowing entry to a community, and blockers inhibit emergence of an organizing focus preventing entry to a community. He uses the term **lock-out** when blockers prevent entry to a community which may lead to **break-in,** and **lock-in** when withdrawal from a community is prevented which may lead to **break-out.**

Wolff's (1976) book about "experience and enquiry today" has much in it that is relevant to the formation of communities of knowledge and the ways in which individuals enter into them. In particular his basic model of **surrender** to a situation so that one may **catch** the essence of it - of becoming through surrender someone different in order to catch hold of something different - gives a valuable insight into the nature of the processes involved in adopting construct systems in order to enter a community. Using Wolff's terminology, we surrender ourselves to a particular role and become a "physicist", a "mathematician", a "manager", a "father", etc., and it is the analysis of our construal of the world in the specific role which we are attempting to catch.

Wolff's model of surrender is most clearly presented in terms of his discussion of the nature of the "mathematician":

> "From the standpoint of the world of everyday life, the mathematician, as we often put it, lives in the 'world of mathematics', dealing with 'nonreal' elements, notably numbers, whose relation to 'real' things, to 'reality', is not part of his concern. Analogously for the logician. What makes our subject-object approach to this attitude misleading is the fact that the subject, the student of mathematics or logic - his or her individuality, including motives and attitudes - is **irrelevant** for our understanding; the only thing that counts is the pursuit, with its results and questions." (Wolff 1976 pp.162-163)

He makes the key point that not only does the **real world,** the **object,** disappear to be replaced by the world of **mathematics,** but also that in entering into this world the person **doing mathematics,** the **subject,** also disappears to be replaced by a new entity, **the mathematician.**

Gray's notion of "system formation" with its necessary "precursors" and heavy emotional content is a useful representation of Wolff's "surrender" which is itself a highly emotionally charged word for what would be conventionally characterized as the **learning process.** For example, Anne is learning to be a mathematician and hence must surrender to the world of mathematics. As she is learning she is locked out from the world of mathematics and prevented from catching it. However, she is locked in to the world of the family since withdrawal from surrender to this world is prevented.

Karl Popper reifies the notion of such a world, which so far has played only a descriptive role as the inferred culture binding together people into a social unity, and terms it a **world 3.** He introduces his **3 worlds** model in his autobiography (Schilpp 1974 p.143) by quoting Bolzano's notion of "truths in themselves" in contradistinction to "those thought processes by which a man may...grasp truths", proposing that:

> "thoughts in the sense of contents or statements in themselves and thoughts in the sense of thought processes belong to two entirely different 'worlds'."

and making the three-fold distinction:

> "If we call the world of 'things' - of physical objects - the **first world** and the world of subjective experience the **second world** we may call the world of statements in themselves the **third world** (...world 3)."

This notion of a world 3 is a useful representation of Wolff's object that we catch particularly when we note its distinct ontological status:

> "I regard the third world as being essentially the product of the human mind. It is we who create third-world objects. That these objects have their own inherent or autonomous laws which create unintended and unforseeable consequences is only one instance (although a very interesting one) of a more general rule, the rule that all our actions have such consequences." (Popper in Schilpp 1974 p.148)

It is possible to synthesize these different approaches into a single framework (Shaw & Gaines 1981) and Figure 3 shows this synthesis for the example given. Here is John with his P-Individuals of husband, sales VP, fisherman and backpacker, and Anne with her P-Individuals of golfer, wife and mathematician. Anne enters into the world of mathematics (Wilder 1981); Anne and John enter into the world of the family (Reiss 1981); John, Sue and Larry enter into the world of the

corporation (Deal & Kennedy 1982). These worlds are independent of the particular individuals but are influenced by the individuals.

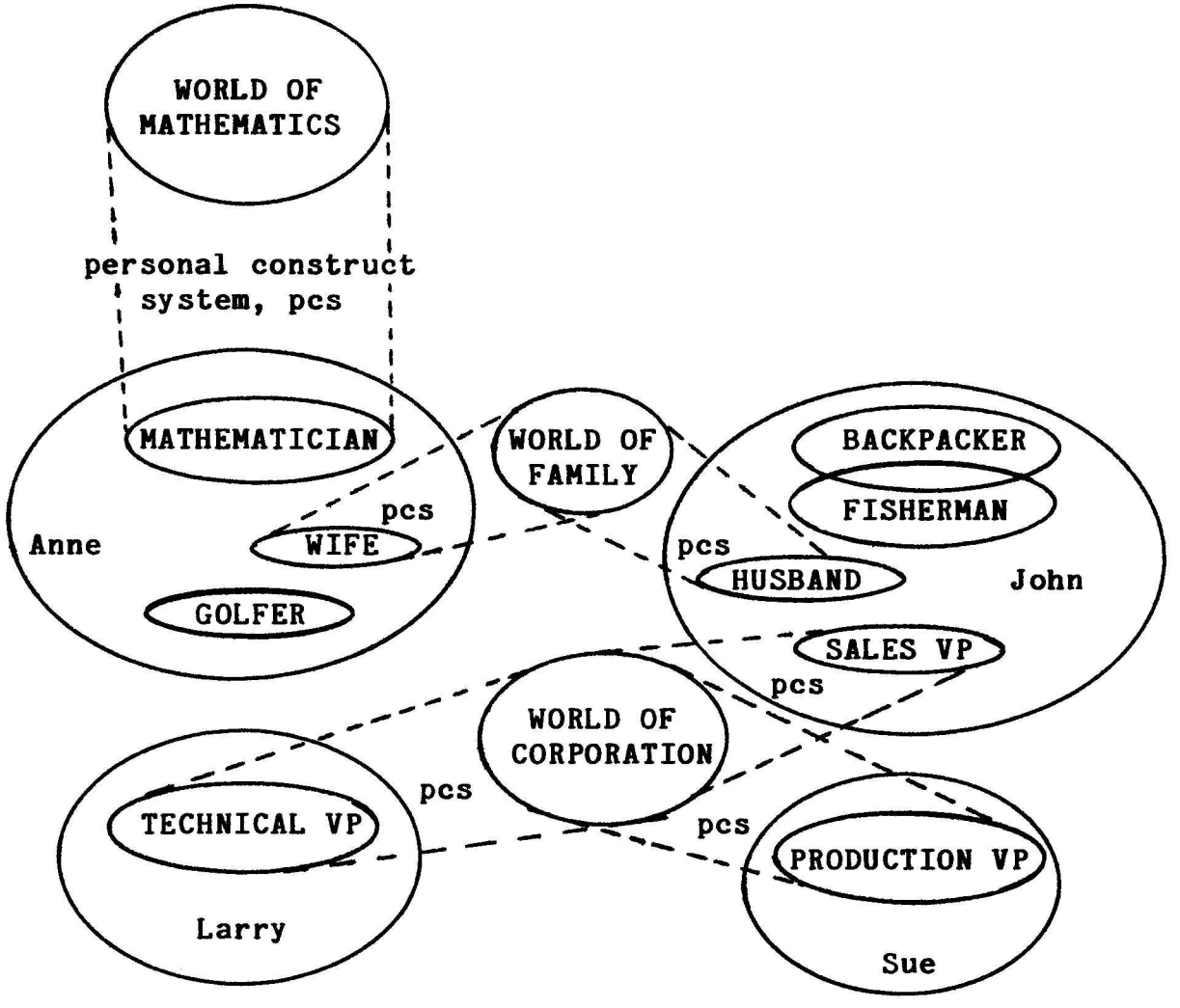


Figure 3: Individuals surrendering to worlds through personal construct systems

Figure 3 shows the sales VP and the production VP as having overlapping construct systems, but the sales VP and technical VP as having no overlap although they enter into the same world. Shaw (1980) notes that each P-individual may have its own system of **personal constructs** and Kelly (1955) re-defines **emotions** in terms of reactions to changes, or threatened changes, in **core constructs.** We thus have a model of a **P-individual** within a particular person using a particular **construct system** by which to **surrender** himself to a particular **world 3** in order to **catch** its essence. This model of coherent intellectual processes, each with its own individuality, each using its own construct system to enter into an abstract world that has its own

reality, provides a very cogent picture of the rationale behind, and the conflicts involved in, the interaction between our personal semantic spaces and our communal ones. It goes beyond any simple concepts of "role playing" by providing the basis for formal models of the mechanisms whereby P-individuals can enter into an abstract world. The "constructive alternativism" of Kelly provides a model for the extreme relativism of our conception of a world. However, its conventionalism needs counterbalancing by Popper's emphasis on the ontological independence of that world in itself.

CONCLUSIONS

This paper has sketched out theoretical foundations for integrating the conventionalist model of personal knowledge proposed by Kelly and developed in previous papers with the normative model of knowledge structures in Popper's theory of 3 worlds. It gives the beginnings of an account of how personal scientists interact with the real world and with one another to form communities of knowledge. It is has shown how the interplay between these two epistemologies leads to the formation of Pask's P-Individuals who in Wolff's terminology surrender themselves to world 3 in order to catch its essence and linked this to Gray's emotional-cognitive theory of the system forming precursors to construct formation. Thus it gives a systemic model of a range of phenomena which correspond at different levels of the organizational hierarchy to a role, a team, a group, a society, or a civilization. The interplay between P-Individuals at different levels gives a model of the interaction between such an individual and its social environment -- how they mutually mould one another. Considering the dynamics of this interplay links Kelly's work with that of the system theorist Klir, the cybernetician Pask, the logician Brown, the psychiatrist Gray, the sociologist Wolff and the philosopher Popper.

REFERENCES

Brown, G.S.
1969 **Laws of Form.** London: George Allen & Unwin.

Deal, T.E. & Kennedy, A.A.
1982 **Corporate Cultures.** Reading, Massachusetts: Addison-Wesley.

Gaines, B.R.
1977 "System identification, approximation and complexity." **International General Systems** 3: 145-174.

1979 "Logical foundations for database systems." **International Journal Man-Machine Studies** 11: 481-500.

Gaines, B.R. & Shaw, M.L.G.
1980 "New directions in the analysis and interactive elicitation of personal construct systems." **Recent Advances in Personal Construct Technology** (M.L.G. Shaw, ed.) Academic Press, London, 147-182.

Gray, W.
1979 "Understanding creative thought processes: an early formulation of the emotional-cognitive structure theory." **Man-Environment Systems** 9: 3-14.

Kelly, G.A.
1955 **The Psychology of Personal Constructs.** Norton, New York.

Klir, G.J.
1976 "Identification of generative structures in empirical data." **International Journal of General Systems** 3: 89-104.

O'Shaughnessy, J.O.
1976 **Patterns of Business Organization.** London: George Allen & Unwin.

Pask, G.
1975 **Conversation, Cognition and Learning.** Elsevier, Amsterdam.

Popper, K.R.
1968 "Epistemology without a knowing subject." **Logic, Methodology and Philosophy of Science III.** (B.van Rootselaar ed.) North Holland, Amsterdam. 333-373.

Reiss, D.
1981 **The Family's Construction of Reality.** Cambridge, Mass.:Harvard University Press.

Schilpp, P.A. (ed.)
1974 **The Philosophy of Karl Popper.** Open Court, Illinois.

Shaw, M.L.G.
1980 **On Becoming a Personal Scientist.** Academic Press, London.

1982 "PLANET: some experience in creating an integrated system for repertory grid applications on a microcomputer." **International Journal Man-Machine Studies** 17: 345-360.

Shaw, M.L.G. & Gaines, B.R.
1979 "Externalizing the personal world: computer aids to epistemology." **Improving the Human Condition: Quality and Stability in Social Systems.** Society for General Systems Research, Kentucky, 136-145.

1980 "Fuzzy semantics for personal construing." **Systems Science and Science.** Society for General Systems Research, Kentucky, 146-154.

1981 "The personal scientist in the community of science" **General Systems Research and Design: Precursors and Futures.** (W.J.Reckmeyer, ed.) Society for General Systems Research, Kentucky, 59-68.

Shorter, E.
1975 **The Making of the Modern Family.** New York: Basic Books.

Wilder, R.L.
1981 **Mathematics as a Cultural System.** Oxford: Pergamon Press.

Wolff, K.H.
1976 **Surrender and Catch.** D.Reidel, Holland.

Zadeh, L.A.
1976 "A fuzzy algorithmic approach to the definition of complex or imprecise concepts." **International Journal Man-Machine Studies** 8: 249-291.

1978 "PRUF - a meaning representation language for natural languages." **International Journal Man-Machine Studies** 10: 395-460.