

# Designing Design Research 2

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## Profile

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- \* Born 1946, one son, remarried.
  - \* Studied Architecture and Music (early live electronic music performance band) at the Architectural Association School, London.
  - \* PhD 1 in Cybernetics, under Gordon Pask, Brunel University
  - \* PhD 2 in Human Learning, under Laurie Thomas, Brunel University
  - \* Has taught architecture, art, design, cybernetics and research at the Architectural Association, Bartlett School UCL, University of POortsmouth, Portsmouth College of Art, Royal Melbourne Institute of Technology, Hong Kong Polytechnic University
  - \* Travels extensively and has lectured, performed, and made conference presentations worldwide
  - \* About 190 publications, is on several editorial boards and edits conference proceedings. Also exhibits, makes large installations and is planning interactive sound sculptures.
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## Challenging the scientific paradigm for research and design

*"Research is a variety of design. So do research as design."*

*"....the purpose of this paper is to construct an argument that gives design back its rightful place in research."*

*"We, in design research, need to redress the balance, to indicate the primacy and centrality of design both as an object of study and as a way of carrying out that study."*

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## Paper - "Keeping Faith with the Design in Design Research"

## **Introduction**

It is interesting to consider whether research in design should attempt to be scientific, or not. We have worked hard and long to make it so, with what are, perhaps, modest gains. The recent Western view of research has been that research equals scientific research, and, therefore, we have taken our models from science. But, when researchers into design are asking, as they are at the moment all over the world and in many different contexts, what models of/for research we should use (taken from which science), it is worth wondering whether we should be importing any models. Is design itself perhaps the model, after all? That is the position which is taken here.

The material presented here covers new ground. However, this presentation does not attempt to be rigorously argued. There are more academic (thoroughly argued and referenced) statements which put many of the points here. Some of these are mentioned in the final section, in which certain central, key references are noted.

## **Design is Fundamental**

My contention is that design is a fundamental human activity. It is how we think and how we compose our thoughts together. Design is what constructivist psychologists describe as at the centre of our ability to work with concepts, although they never use the word (see below). In general, when we talk of research, we are talking of scientific research. It is a measure of the success of science that we identify the two. In the context of this essay, the type of research considered is research presented as scientific. In this account, science is a special case/type of design in which the actions of the designer are restricted in particular ways. It is inappropriate, therefore, to expect design to be a special case of science. You do not expect the set to be a sub-set of its own sub-set: to do so is like trying to put a quart in a pint pot. So a scientific approach to design can only have limited and somewhat specialised value (while a design approach to science should be really illuminating).

As designers, we should accordingly work towards a more appropriate recognition for design as this fundamental human activity, that is, to propagandise. To do this, we need not only to consider the nature of design and of research (and the relationship between the two), but also how we can build the confidence to speak plainly about these understandings and their importance. We need to speak of design as central even to the scientific endeavour, not as an anomaly a bad fit, an inadequate subject failing to be properly scientific. Of course it fails! We need to go beyond this view of design as inferior, as subservient. I am not arguing to exclude, or entrenching myself against, the research work of others, against research into design as science, or against research into design coming from different approaches such as the conventionally scientific. Its just that I dont do it, and dont (from my point of view) consider it very interesting or valuable. But there are many approaches coming from many angles. All have their values. The inventor of serial music, Arnold Schoenberg, once said something to the effect that there was much good music still to be written in G major. But not by him. There is much good research (into design) to be presented through a scientific approach. But not by me.

## **Designers are Constructors**

There are many ways to define design, many points of view. However, if design is to be differentiated from other areas (such as problem solving) it is important to look at what is

unique, or at least distinct, in design, what these other areas do not have. While the design activity usually requires some problem (of a functional kind) to be solved, this is not what makes it interesting or different. What distinguishes it (especially from problem solving and approaches related to it) is that it is concerned with the use of circularity. Designers carry out circular actions to make their designs. They draw, look at their drawings, reconsider them extracting whatever they find to extract, and then draw again: usually refining, extending, composing together and enriching; or even, on occasion, rejecting the previous drawing. Thus, they can release the individuality of the designed object. (In a very real manner, the design question follows the design answer.) This is not all that designers do, but it is a (I would contend the) major element. I believe this form of circularity to be so important that I am willing to use it, prescriptively, as a requirement,

The circularity used is like a conversation (in Gordon Pask's sense) held with oneself through paper and pencil. Of course, the conversation may be with others than oneself, and may use media other than paper and pencil. It is a quality of the image that I am trying to communicate. Pask, progenitor of Conversation Theory, already pointed this out in 1968. This conversational circularity leads, more-or-less inevitably, to novelty. In a conversation, the participants do not share the same understandings: they create their own understandings, necessarily private, which they find work in manners similar to each other. The inevitability of difference leads to the finding of the unexpected, that which was outside the framework of the others, ie (at least local) novelty. Even when the other participant in the conversation is myself, it is myself at a different time, and wearing a different metaphorical hat (eg designer/critic). The medium also participates: it is never neutral. Design, in my characterisation, is circular and conversational. Conversation is interactive (as opposed to active or active and reactive, the latter often being confused for interaction by multimedia jargon). Interaction occurs in a space between participants and involves a degree of unpredictability, just as design does. Design is interactive. And all these activities are constructivist, in the philosophical sense of the word. Radically Constructivist, they depend on the notion that we act through our individual understandings and these understandings form the world we see: there is no world without our presence. There is no design without us (designers) and there is no result of a design action we have not constructed.

(It will be clear, I hope, that many involved explicitly in problem solving and other non-design areas are also, maybe to their surprise, doing design.)

Designers are constructors: in how we make in what we make and its existence for us to use in the environment.

There will be some who disagree with the position developed above because they see design very differently, and do not share the view that design is circular, conversational, interactive, constructive. Some look for a deterministic reduction of design to linear mechanism, to predictability and the feeling of correctness that goes with that, and to that feeling of security we get when we believe that what we do is right and we did not have to take the responsibility for judging it to be so. To them, all I can say is that we are talking about different things. I cannot resolve this difference except by recourse to Occam's Razor. But Occam's Razor rarely cuts when the difference lies in belief and intent.

## **Designing is How We Think**

In our studies of how we manage to create our concepts of the world, and to compose them

together, we have been taught by the constructivist psychologists Jean Piaget and George Kelly. In their accounts, our interaction with the world, through which we find out both about ourselves and about that world, is by means of the construction of concepts (of the world) and their assembly into those systems of interlinked and interconnected concepts that constitute both our understanding and who we are.

Constructivism, in this context, is a way of describing how we can think of the world and our relationship with it. In the tradition of Western philosophy there have been two main schools (forgive the simplifications). The realist holds that there is a real world that exists independent of us, which we have to find out about. The idealist (in the extreme, the solipsist) holds that the world is a product of the intelligence observing it. To these the constructivist may be added. This holds that we cannot know whether or not there is a world independent of us, for all our knowledge comes through interaction, and we are always present. What we can know is that we have understandings and we construct them (together), and hence we create an image of our world: which is as close as we can get. The responsibility for this lies with each of us. The processes Piaget and Kelly proposed (they worked separately) are essentially circular. Piaget was particularly concerned with how we come to have concepts, and described a circular process by which we come to identify the objects of the real world as we make our concepts of them. He noted that new concepts were assimilated and accommodated within the collection of our already existing concepts. Kelly indicated how we could assemble concepts so that their assembly sent us back to reconsider their validity. These processes are circular: we do and we check and we modify (do again, a bit different).

In this manner we design our thoughts and our understandings: and what we know (and what we (think we) know it about). The circular processes we are involved with are interactive. The area of study that is primarily concerned with examining such processes is (second order) cybernetics. Design mirrors how (we think) we think and how we act and learn.

### **Science is also Constructive**

Thomas Kuhn and Imre Lakatos both showed us that science as done is a far cry from science as described and theorised over. Science as presented seems to be based in a world independent of human intervention. The language in which it is presented has traditionally been impersonal and without agency. Things just happened. For instance, in optical experiments, lenses (objectives), screens and light sources just happen to be at certain positions on a meter rule which just happen to give a sharp image, and these positions just happen to be read, all as if by magic or inevitability. Data is generalised so that it fits curves of convenience, there is assertedly no interpretation (yet the inconvenient is ignored or rendered invisible): supposedly, what is revealed is the Laws of Nature (assumed to be simple, mathematical and elegant). Yet science is also seen in Poppers idealisation as made of Conjectures and Refutations.

This is not the place for a long discussion on science. Suffice it to say that science is an activity undertaken by humans. That someone places the optical elements, that is, carries out the experiment: collects and arranges the data, builds understandings such as curves of convenience that include and exclude the data, etc. The actuality of science is far removed from the conventions of its descriptions (although the language of science is changing rapidly).

And the actuality is constructive: the experiments involve a carefully controlled (restricted) interaction between us and the world and the outcomes of these experiments are evaluated and

viewed through the lens of what is already known. Concepts are developed and are refined through a continuous circular (design) process that (actually) both refines and reinforces them, until, having patched over difficulties for long enough, they eventually break down and need replacement. Furthermore, the collection of these concepts and their assembly together is just like the assembly that we carry out as individual humans when we assemble our concepts together to provide our view of the world: that is, both circular and designed.

There are examples in contemporary science that make this constructive, design-based nature of science abundantly clear. One example is the way that image enhancements (used on images when we see nothing until we do, finally, see something) are used to generate an actuality of features, that is, regularities, patterns, a break in the random. NASA's re-ification of tall chimneys made of frozen nitrogen on the surface of Triton, a moon of Jupiter, following the Voyager fly-by a few years ago is a most telling example.

### **Keeping Faith with the Design in Design Research**

So we discover that science as it is done is, in fact, a branch of design. The whole procedure involves the conversational circularities of interaction that typify design, as discussed here. Research is a branch of design, because research is taken to be scientific, and science is a variety of design. (This is regardless of the probability that research, itself, is a design activity.)

It is true that science follows all sorts of hygienicising procedures. Devices are in place to encourage the creation of the uniform observer (a matter unfortunately too complex to broach here) and (thus) the isolation of (uniform) variables; the fabrication of factuality through repetition; theoretical propriety through consistency, completeness and coherence criteria and so on: and the laudable criterion of falsifiability the description we have holds only for now, until either proved wrong or superseded. These give science its edge, its power, its particularity. But they are applied within a design framework. They are what makes science a restricted form of design. And this is exactly why it is inappropriate to demand that design research should be scientific. It is, rather, the other way round: scientific research, being designerly, should recognise it. Although some research into design may well be scientific why not, as long as it remembers where it comes from and what its status is.

We should not limit Design to the scientific and we should not limit research into design to scientific research into design: we should, rather, bring design and design understandings more openly to bear on science and scientific research. Which, actually, is what happens even while we pretend otherwise. This is an exciting challenge, and provides a most convincing way for design to prove its value; to study design on its own terms and to offer the insights developed to aid the furtherance of research and science.

And we should recognise design for what it is, for where it is and for its importance, and we should research and report it accordingly.

**A Note and Some References** For more academic (thoroughly argued and referenced) statements which put many of the points here, refer to Glanville, R (1980) Why Design Research, in Jacques, R and Powell, J (eds) (1981) Design/Method/Science Westbury House, Guildford, and Glanville, R (forthcoming) Re-Searching Design Research Why Not Research Design to be published in Design Issues. Glanville, R (1994) Variety in Design Systems Research, vol 11, no 3, is also relevant for the discussion of the notion of creativity, as used here. Interaction (and creativity) are discussed in Glanville, R (1997) Behind the Curtain in

Ascott, R (ed) Consciousness Reframed 97, University of Wales College, Newport.

But I aim to cover the new ground mentioned at a later date in more rigorously argued papers. The Pask paper referred to is Pask, G (1969) The Architectural Relevance of Cybernetics Architectural Design 9/1969. Conversation Theory is introduced in Pask, G (1975) Conversation Theory Hutchinson, London. For Piaget and Kelly see Piaget, J (1955) The Childs Conception of Reality, Basic Books, New York and Kelly, G (1955) A Theory Of Personality, Norton, New York. The major recent texts on science, scientific knowledge and research are probably Popper, K (1969) Conjectures and Refutations 3rd ed, Routledge and Kegan Paul, London, Lakatos, I (1969) Falsification and the Methodology of Scientific Research Programmes in Lakatos, I and Musgrave, A (1970) Criticism and the Growth of Knowledge Cambridge University Press, Cambridge and Kuhn, T (1970) The Nature of Scientific Revolutions 2nd ed, Chicago University Press, Chicago.

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