

MAKING POSSIBLE SUPPOSES CREATING CONDITIONS

A house is not designed to *cause* a household, but to make different kinds of households *possible*. It creates conditions for a household but it does not determine a specific kind of household.

The difference between *cause* and *condition* is crucial for the distinction between empirical research and design study. A cause is a condition for an event, but not every condition is also its cause. By 'condition' I do not mean primarily the logical condition with a *truth* value ('if ... then', 'then ... if' or 'then and only then ... if'), but a 'practical condition' with a *possibility* value: not 'if x then y *true*', but 'if x then y *possible*'.

The 'practical condition' does not conclude, does not generalize, but it generates, specifies, makes feasible in a constructive series. I will use the term 'condition' in this sense, unless otherwise stated, or if the context shows otherwise. Suppositions are conditions for imagination. You can imagine something only on the basis of all sorts of hidden, self-evident or learned pre-suppositions. There are, however, also assumptions^a *limiting* that imagination and thus blocking our design skills.

DESIGN DOES NOT SEEK ONLY TRUTH OR PROBABILITY

A design is not a prediction. Yet the designs themselves, including the inventions that have made discoveries possible, are generally regarded as the scientific results of seeking truth or probability. *That is a false assumption.*

The printing press exposed opinions to broad criticism, a condition for modern science. The telescope brought Galileo new understanding of planets, their orbits and valleys. With his microscope Van Leeuwenhoek gave the go-ahead for microbiology. The pendulum clock of Huygens made time measurement possible. The numerous electrical experiments with strange, often useless instruments preceded the theory.

Thermodynamics came forty years after the steam engine. Shortly thereafter followed the combustion engine of Nicolaus August Otto^b, a grocery without a science degree, whose invention lives on today. The theory of relativity was designed by an inventor of refrigerators^c, working on a patent office, before its validity was proven. It requires more than purely empirical research in order to proof its reliability afterwards.

A theory is *designed* once and tested repeatedly with *designed* instruments. Previous hypotheses are not discovered, but *designed* as a possibility. Their 'truth' (operation) is only 'discovered' by empirical research. The hypothesis gives direction to the research question. The assessment, preferably by others and in any case with an attitude other than that of inventors, requires verifiable reliability and validity.

a I do not yet use the word 'supposition' here. I reserve this for conditions making our imagination possible as underlying stones in a construction.

An 'assumption' than is an arbitrary, non based statement 'taken for true', in a logical reasoning or taken as (im)possible in a design.

b https://nl.wikipedia.org/wiki/Nikolaus_Otto

c Schils(2008) Einsteins koelkast(Diemen)Veen Magazines

1 SCIENCE SUPPOSES DESIGN, NOT THE REVERSE

The inventors have undoubtedly made *use* of previous scientific discoveries and results, but designing is more than just use. Scientific research is part of that more comprehensive, typically human imagination that we call designing, and not the reverse.

Truth-finding leads to fixed, broadly shared assumptions (paradigms) that can even stand in the way of that bold ability to imagine unlikely, *improbable* possibilities. Designers must dare to disregard standard suppositions, simply forget them or replace them with others, to come up with something new. Some call it 'reframing', but it is not just about the framework.

FOLLOWING AN EMPIRICAL METHOD, YOU CANNOT LEARN DESIGNING

Everyone looks for opportunities in daily life, *designs* them before they are realized and used. Searching for truth is a laborious part of this, but *possibility* includes more than truth. You may *know* what is already there. You have to *make* what is not yet there. You can know, but you know not can. There are widely accepted methods for 'knowing', but 'being able' should be practiced by doing.

Some designers have made their job of looking for new opportunities. How did they learn that? In the design training of my university we followed lectures of researchers and designers in the morning. This was mostly about existing designs and techniques, but art history does not make artists yet. In the afternoon we made designs ourselves, under the supervision of design teachers in studios.

In that other world of design studios little reminded of the lectures in the morning. This medieval scholastic sequence ('lectiones' in the morning, 'disputationes' in the afternoon) can be better be reversed in design education. Designing raises questions. Answers do not produce designs.

The design teachers each told their own story. It even seems as if there are as many methods as designers.^a

The research teachers were more unanimous. They were empowered by the empirically trained specialists with whom the teaching team was expanded to make the program more 'scientific'. This way, it could happen that design is now mainly taught according to the lines of empirically inductive and deductive research (problem definition, objective, etc.).^b That is also expected from a university. It just does not work.

Designing is more than induction and deduction. It is also more than abduction (**Fig. 40** p37).^c There is much literature about existing designs, much less about how you make them. We can know, but we apparently cannot 'know' the prior 'can'. How should you *learn* to design? In order to unlock possibilities you probably also have to *unlearn* things.

a S Jong: Voordt(2002)Ways to study and research urban, architectural and technical design(Delft)DUP p20
[http://www.taekemdejong.nl/Publications/2002/Jong\(2002\)WaysToStudy\(Delft\).pdf](http://www.taekemdejong.nl/Publications/2002/Jong(2002)WaysToStudy(Delft).pdf)

b Simon(1969)The Sciences Of The Artificial (CambridgeMass1982)MITPress p36 'Heuristic search... is in fact the principal engine for human problem solving ...'

c Among others defended by Dorst (2013) Academic design (Eindhoven) TUE Inaugural address. It is impossible, however, as a designer of *possibilities* to derive a methodological justification from the *truth* logic. (See further Fig. 3 p8 and note a op p44)