

## Research and its Standards

Fundamental aspects of research:

1. Systematic inquiry: It is through systematic inquiry that particular information is identified within the rest of our experience. All research, thus, is reductionist in some way or another (research necessarily involves reducing lived experience or observed phenomena to chunks of information that are noted and categorized in some way).
2. Knowledge creation: This is the goal of research. This does not necessarily have to be 'grand'; new knowledge can emerge in relatively small increments, attained through a variety of means. The focus of this knowledge is usually a physical outcome of design, but can also be the process of design or the practices of design firms.

The process of research is developed in steps, from systems of inquiry to strategies to tactics. Systems of inquiry are the processes within which more specific choices about methodology are made. Then, at a more specific level of focus, there are strategies (methods) and tactics (techniques). A strategy is the overall research plan, and a tactic is the specific technique used to obtain data.

### Research Strategies:

There are 6 primary research strategies employed in design research:

*Historical research:* This method draws upon historical evidence. Useful when the research question focuses on something from the past (for example, how to design a poster in Art Deco style).

*Interpretive research:* Focuses on contemporary circumstances. Because these are essentially 'shifty', social phenomena, they are best tackled by the qualitative system of inquiry (see 'Research Standards', below); phenomena such as: 'the effects of contemporary media on young designers', etc..

*Correlational research:* The discovery of patterns in a particular setting or circumstance. This is usually a continuation on previous research. Sometimes, interesting patterns emerge from research (for example, in researching the design of coffee-shop signs, one might also notice that some seemingly-neutral names of trendy coffee-shops tend to be similar: Patinette, Pannikin, P\_). These raise interesting questions.

*Experimental research:* The most common research method. The careful manipulation of variables (often in a lab setting), with the goal of attributing causality. This is usually quantitative, since it deals with measured and controlled circumstances.

*Simulation research:* The recreation of some aspect of the physical environment; interested in determining the likely success of a design. A common tool in this process is the computer, since it can fix a whole range of variables.

*Logical-argumentation research:* A sequence of logical steps within a closed system; typical of the fields of philosophy or math. Thus one might employ this method to develop a philosophical treatise on design, or a comparative analysis of paper sizes.

### Research Standards:

Since all research is based on a conceptual framework, the standards of any research are substantially dependent on the researcher's 'system of inquiry' (his/her personal assumptions; also known as 'research paradigm'). Research is not based on an ultimate truth; ultimate truthfulness can never be established.

Two primary systems of inquiry are science and myth. Although both are used to 'explain', the way they do so is quite different. A scientific explanation is typically portrayed as a 'mathematical' description, made up of linked fragments. On the other hand, mythic or poetic description is seen as continuous, holistic, divergent, and generative. The

split between these 2 systems of inquiry is also described as quantitative (scientific) versus qualitative (mythical). Quantitative research assumes an objective reality, and views the researcher as independent from the subject of inquiry (deductive; seeking cause-and-effect). Qualitative research, on the other hand, assumes a subjective reality, viewing the researcher as interactive with the subject of inquiry (inductive; focusing on multiple critical factors). Most recently, quantitative and qualitative systems have been described as 'postpositivist' and 'naturalist', respectively. The primary difference here is found in the 'postpositivist'. Whereas previous quantitative procedures were a bit 'naive' (aiming, in a positivist manner, at an absolute truth), the postpositivist admits that 'out-there' reality can only be known within some level of probability. Note: nothing is ever absolutely black or white, of course; naturally most research studies employ a combination of quantitative and qualitative tactics. It is more useful to think of the 2 systems of inquiry (and all of the levels in between them, as a cluster, as opposed to the traditionalist continuum that spans from informal observation on one end, to laboratory research on the other. As a final comment on of 'systems of inquiry', please consider that each is defined by ontology and epistemology. Ontology is the way in which the nature of reality is perceived, while epistemology deals with the nature of knowledge (the direct relation between knower and data). Under postpositivism, ontology proposes that there is a single reality, already pre-constructed. The naturalist ontology, on the other hand, proposes that there are multiple realities, each constructed by/within a different social construction. The epistemology of postpositivism requires the researcher should act in a dispassionate, objective manner. Naturalism, on the other hand, asks that the researcher be linked interactively.

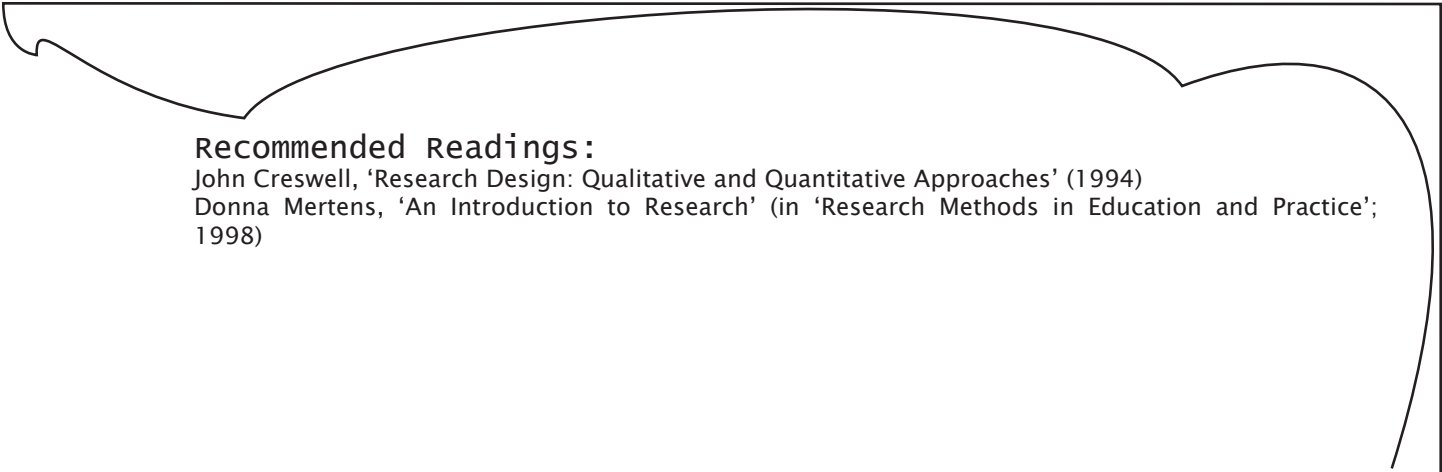
The ways in which validity is established within both systems of inquiry is quite different, of course. The most important thing to remember is that even a naturalist system, with its 'subjectivity', is able to maintain the same level of quality standards as a postpositivist method (they both maintain truth value, applicability, consistency, and neutrality):

*Truth value:* Postpositivism establishes this by evaluating whether the key concepts and operations of the research are truthful representations of the subject being researched ('internal validity'). For example, in establishing a questionnaire that measures the level of students' satisfaction at a design school, one has to clearly define 'student satisfaction' as well as the correspondence between the questions and this definition. Naturalism deals with truth value by achieving 'credibility', cross-checking data and investigations. Many questionnaires are handed out, and the truth is established from the results that the sheer quantity of data reinforces. Also, data is verified directly with the subjects of research ("did you mean to answer this question in this way?" "tell me more" etc.). Basically, under naturalism, truth value is established by many questions and many subjects.

*Applicability:* Under postpositivism, any study will include a description of the context within which it is applicable ('generalizability'). For example, in researching the effects of sunlight on a photograph, postpositivists try to note every aspect of the context (time of day and year, sun angle, wind), creating a framework for the research. Naturalism, on the other hand, focuses on 'transferability', where the setting-framework is also described, but in more subjective ways: the type of day, the observer's emotional state, the picture's theme...

*Consistency:* Postpositivism depends on 'reliability'. The assumption is that research methods yield similar results at a different location/ time if they are conducted under the same conditions. This is easy to do in the case of stable physical objects and properties (ie the effect of Photoshop's Gaussian Blur filter at particular settings). In the case of social phenomena, 'reliability' can only be establishing by repeating the research in the same location/ time at various occasions. Naturalism is also interested in consistency, but considers that instabilities will always exist (even if the subject/data is fixed in a location/time, the investigator and his/her tools can contribute errors). Thus, here it more a matter of 'dependability', established through extensive documentation. The more ways of collecting, analyzing, and interpreting data, the better.

*Neutrality:* The goal of postpositivists is to keep the potential bias or interference of the researcher out of the process ('objectivity'). Procedures should be strictly specified and administered. All quantitative data is provided. Naturalism, rather than demanding objectivity, aims at 'confirmability'. The researcher's biases are clearly noted, so that readers, at a later time, can filter them out on their own. Thus it is very important for the researcher to reflect on his/her epistemological/ ontological assumptions, their influence on the particular investigation, and any effects that the investigation results may have had on the researcher's views.



**Recommended Readings:**

John Creswell, 'Research Design: Qualitative and Quantitative Approaches' (1994)

Donna Mertens, 'An Introduction to Research' (in 'Research Methods in Education and Practice'; 1998)