Types of Generalisation from a Single Case
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Abstract
Evaluations are case studies from which knowledge is transferred to other cases by some form of generalisation. There are several types of generalisation. The aim of this paper is to discuss the different types of analytical generalisation. Besides the hypothetico-deductive model and inductive theory generation there are two further forms of analytic generalisation, both based on abductive reasoning. One constructs or reconstructs a case from an unexpected observation by applying some kind of principle or theory. The other is based on comparisons with known cases. In the case study methodology literature this kind of generalisation is called naturalistic generalisation. This is similar to the way in which practitioners confront problem situations by making references to their repertoire of cases. Through exerting an influence on the field of design through reflection on case studies, this last mode of generalisation has the potential to bridge the gap between research and practice.

Introduction
The aim of an evaluation is to learn from experience in order to improve practise. The object of an evaluation is some type of complex functioning unit. Generally, an evaluation is conducted in a naturalistic setting using various methods. It is, thus, an evaluative case study. The transference of knowledge from an evaluative case study to other cases is achieved through some form of generalisation.

In this paper I will explore the different types of generalisation from a single case. How is generalisation from a sample of one possible? In the context of representational sampling strategies, it is, of course, not possible at all. But if the unique case is analytically selected — purposefully selected — it is possible to generalise analytically from a single case. There are several modes of analytical generalisation. The paper also discusses the potential of case studies to confront the long-standing resistance to research within the architectural field.
Generalisations based on deduction or induction

One type of generalising from a case is what Yin (1994) refers to as *replication logic*. The principle is that of emulating experimental design from the natural sciences: “The replication logic is analogous to that used in multiple experiments.” Initially “the investigator is striving to generalise a particular set of results to some broader theory.” Then the “theory must be tested through replications of the findings in a second or even a third [case], where the theory has specified that the same results should occur”. The most important rationale for selecting a case is that “it represents the critical case in testing a well-formulated theory.” This mode of generalising through the repeated testing of hypotheses is based on the pattern of hypothetico-deductive reasoning and falsificationism outlined by Karl Popper (1972, Figure 1). I will not elaborate further on this mode of generalisation from a single case.

*Figure 1.* Generalising from a case by the hypothetico-deductive method or the logic of replication.

A second type of generalising is based on induction. Observations are made from within the case and patterns are recognised in the material through coding procedures. Generalisations are made through conceptualisation. Such generalisations are made not to universal theory, but to micro or middle-range theory, with a limited domain of applicability. This is achieved, for instance,
by applying Grounded Theory procedures or anthropological fieldwork methods (Glaser & Strauss, 1967; Strauss & Corbin, 1998; Wolcott, 2001) (Figure 2). I will not discuss this mode of generalisation further.

*Figure 2. Generating theory in a case is one mode of analytical generalisation from a single case. Theory is normally equivalent to a set of related concepts.*

**Generalisations based on abduction**

Yet another type of generalisation applies a third principle of reasoning: abduction. The pragmatist philosopher Charles Sanders Peirce coined the concept of abduction. At different times he called it by different names: Hypothesis, Hypothetic Inference, Retroduction or Presumption (Fann, 1970). I will use the term “abduction”. Peirce (1992) defines abduction in the following way: “The surprising fact, C, is observed; But if A were true, C would be a matter of course, hence, there is reason to suspect that A is true”. This is a process of reasoning that constructs, or reconstructs, a case from a few facts, or clues. Peirce gives an example: “Numberless of documents and monuments refer to a conqueror called Napoleon Bonaparte. Though we have not seen the man, yet we cannot explain what we have seen, namely, all these documents and monuments, without supposing that he really existed.” The historian Carlo Ginzburg (1989) calls this epistemological model “an evidential paradigm” and argues that “sufficient attention has not been paid to
this paradigm, though it is very much operative in spite of never having become explicit theory.” In the practice of, for instance, history, archaeology, criminal detection and law, the evidential paradigm is the most significant epistemological model. These disciplines have in common the capacity to project retrospectively: to infer the causes from only the known effects. Ginzburg claims that “they are highly qualitative disciplines, in which the object is the study of individual cases, situations, and documents, precisely because they are individual.” This type of reasoning can also be identified in the process of architectural design. The conditions of a design problem, together with what Jane Drake (1979) calls a “primary generator” — a design principle of some kind — result in an articulated design solution (Figure 3).

Figure 3. (Re-) Constructing a case from fragments (clues).

Peirce claimed that “[abduction] is where we find some very curious circumstance, which would be explained by the supposition that it was a case of a certain rule, and thereupon adopt that supposition.” This is similar to the first definition, but Peirce continues: “Or, where we find that in certain respects two objects have a strong resemblance, and that they resemble one another strongly in other respects”. Clearly, there are two kinds of abduction. Peirce calls the first mode of abduction “retroduction” and the second mode “analogy”. The second kind of abduction is based on the idea that sound knowledge of one or a number of cases may be compared with a problem in order to develop a strategy of how to deal with it.

Abduction by analogy
Abduction by analogy leaves the process of generalisation to the receiving context. The case study researcher might have an intrinsic interest in the case, in which case “the case is given. We are interested in it, not because by
studying it we learn about other cases or about some general problem, but because we need to learn about that particular case. We have an intrinsic interest in the case and we may call our work *intrinsic case study* (Stake, 1995). This fourth mode of analytical generalisation is called *naturalistic generalisation*. Stake explains that “people can learn much that is general from single cases,” but that “[t]hey do that partly because they are familiar with other cases and they add this one in, thus making a slightly new group from which to generalize.”

*Figure 4. A naturalistic generalisation is made through comparison with a repertoire of cases.*

This process very much resembles Donald Schön’s model of how professionals think in action. According to Schön (1995), when the professional faces a problem situation that is characterised by uncertainty, complexity, uniqueness and a conflict of values, the reflective practitioner treats his “case” as unique. He cannot handle the unique case simply by applying standard theories or techniques. Instead he deals with the problem situation by making comparisons with a repertoire of known cases: “The practitioner has built up a repertoire of examples, cases, images, understandings and actions. (…) When the practitioner makes sense of a situation he perceives to be unique, he *sees* it *as* something already present in his repertoire.”
According to Schön’s model (1995), “reflection-in-action in a unique case may be generalised to other cases, not by giving rise to general principles, but by contributing to the practitioner’s repertoire of exemplary themes from which, in subsequent cases of his practice, he may compose new variations.” The cases that constitute a repertoire can be based both on personal experiences and on cases that are model cases established within the profession. Schön (1987) argues that when someone learns a practice “he is initiated into the community of practitioners and the practice world they inhabit.” Among other things he learns their repertoire of exemplars.

In addition to experienced and established model cases, cases which become known through research can also add to the repertoire of a practitioner and thereby bridge the gap between research and practice. In his book *Modern Architecture Through Case Studies*, Peter Blundell Jones (2002) concludes that “In comparison with grand theory, the case-study is not so irrevocably won or lost: it provides possible evidence for other versions, and there is always the opportunity of adding further studies to make a progressive investigation.” Blundell Jones’ fifteen case studies of architecture within the modern movement are probably already present in the repertoires of most architects, but it is worth emphasising that his case studies enrich these repertoires by contributing to the depth of each example.

*Figure 5. The four types of analytical generalisation from a case.*
Conclusion
There are four types of analytical generalisation from a case (Figure 5). The different types do not exclude each other and can perfectly well be combined in a case study. The two types of generalisations based on abductive reasoning are both crucial in the work of the reflective practitioner. These types of generalisation thus have the potential to bridge the gap between research and practice through case studies.

References