Preservation & sustainability: The case for 'realistic' evidence-based design policy

Christopher Koziol

University of Colorado, Denver, Colorado

ABSTRACT: In recent years, partisans of historic preservation have begun arguing "the greenest building is the one already built."[i] Often voiced in response to a narrowly conceived idea of building envelope energy performance, the statement nevertheless assumes away a proper research agenda. The underlying values appear incommensurate, and the differences between practitioners has appeared in a variety of public policy controversies ranging from conflicts over local preservation and sustainability ordinances, to government building energy performance contracting, to sufficiency of USGBC LEED standards for addressing issues of historic buildings. The potential question for the architectural researcher addressed here, is how to best frame the underlying research question. What metrics and data are relevant to policy and building level analysis?

As a means of answering this question, this paper attempts to step-back from the tit-for-tat of the usual arguments by elaborating on how an evidence-based research program might address the problem. Specifically, the paper briefly discusses the genesis of evidence-based decision making in healthcare, and its ensuing extension into both building design and public policy making. The case is made that a discussion occurring among another group of scholars - those in public policy - is directly relevant to how designers might begin to more explicitly address what constitutes *evidence* in policy setting, as opposed to a more open-ended notion of *data*. The relevance of this as applied to sustainability and preservation lies in an urgency expressed by preservation advocates such as the National Trust for Historic Preservation and its recent call for "data to make our case." This reference to data assumes that this will bring about agreement and supportive policy. However, the literature on evidence-based policy is more circumspect of simplistic relationships. It is interested in program logic (why we think an intervention will have the effect we think it will) and causation (how and through whom the effect will be carried out).

While this paper addresses methodological issues in research, its abstractions are grounded in particular examples and ongoing dilemmas in the relationship of preservation to sustainability. These examples will be used to illustrate the more abstract points.

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INTRODUCTION

It would be quite presumptuous to declare what *evidence-based design* 'is', and what it 'is not.' However, a brief review of the term's use in the recent literature suggests that its most common association is as an extension of evidence-based medicine. Hence, its most frequent application in architecture is in health-care design. While this is not astonishing it is potentially limiting in the ways that empirical knowledge does and can affect various specialties of architectural practice. Specifically, recent controversies in the relationship of historic preservation to sustainability allow the researcher to explore another potential extension of the logic employed in evidence-based architecture. Public policy scholars hold a relationship to their practitioners (i.e., politicians) similar to that of medical researchers to theirs (i.e., doctors); and we might add, also akin to that of architectural researchers to architects.

Historic preservation is a term referring to a relatively complex practice and is used to mean different things among different groups. Preservation is public policy, it is local regulation, it is design, and it is conservation treatment among other activities. One recent way of understanding these multiple perspectives is treating preservation as a changing and evolving discourse (Smith 2006, Koziol 2008). In this, the perceptions and actions of individual actors are recognizable and subject to analysis within the larger context. Hence, like physical facts (e.g., material decay, structural failure), the actions of preservation actors can be observed, and their underlying assumptions of cause and effect inferred through analysis. In the language of evaluation research, the actions of preservationists are *theory-*

based (Rossi *et al* 2004).

Historic preservation, like many specializations in architecture and design, has been affected in recent years by the public discourse on sustainability (Lesak 2005). In recent years, partisans of historic preservation have begun arguing "the greenest building is the one already built" (Elefante 2007). This epithet, often voiced in response to a narrowly conceived idea of building envelope energy performance, is sometimes employed in a manner that assumes a *proposition* to be proven *fact*. Preservation advocates cite concepts like "embodied energy", "climate-responsive vernacular building types" and "sustainable craft traditions" in response to counter claims often reduced to a single metric of thermal resistance ('R' value) of a wall, roof, or most centrally to the preservationists' chagrin, windows. The underlying values appear incommensurate, and as a result neither side fully convinces the other of its argument.

The connection to the concept of evidence is based on the proposition that both physical facts and individual understandings manifested as behaviors can be understood and applied as evidence in the practice of historic preservation. Hence, the challenge is to develop a framework for such an analysis.

As this is a preliminary inquiry, this paper is not intended to be conclusive; rather the goal is to be constructively provocative. First, the connection to evidence-based design, as it is currently used in the literature, is established. Second, complications regarding the complexity of evidence as discussed in the policy and management evaluation literature are introduced. Third, these concepts are integrated and applied to a discussion of a case involving preservation and sustainability. Finally, an argument is made for the increased use of an expanded concept of *evidence* in historic preservation and architectural practice.

1. EVIDENCE-BASED DESIGN

1.1. Connection to evidence-based medicine

The discussion of evidence-based decision making in the design disciplines have largely grown as an extension of calls for better "integrating individual clinical expertise with the best available external clinical evidence from systematic research" (Sackett *et al* 1996: 71). The authors continue to define their concepts.

> By individual clinical expertise we mean the proficiency and judgment that individual clinicians acquire through clinical experience and clinical practice. …By best available external clinical evidence we mean clinically relevant research, often from the basic sciences of medicine, but especially from patient centred clinical research… Good doctors use both individual clinical expertise and the best available external evidence, and neither alone is enough. Without clinical expertise, practice risks becoming tyrannised by evidence, for even excellent external evidence may be inapplicable to or inappropriate for an individual patient. Without current best evidence, practice risks becoming rapidly out of date, to the detriment of patients. (Sackett *et al* 1996: 71-72).

Intriguing here, is the concept that effective practice is neither solely dependent upon the accumulated, and often tacit, expertise of practitioners, nor only on better 'basic science' research. What stands out in this argument is the importance of "patient-centered" knowledge. This idea of integration has led to a rapid adoption of this concept by other health and 'helping' professions. Nursing, social work and others have all seen increased reference to this concept in their respective literatures (Reynolds and Thinder 2000). As more professional disciplines have begun using this concept "evidence-based practice" (EBP) has begun to supplant the term "evidence-based medicine."

1.2. Connection to healthcare design

It is also no wonder that healthcare design would be among the first of the design specializations to adopt the language of evidence-based practice. Sharing a connection to patient-centered research, the extension of the concept was relatively unproblematic. Architectural researchers specializing in the behavioural and natural sciences have long had a ambivalent relationship with design practitioners (Rowe 1991). While the literature of post-occupancy evaluations (POEs) and building performance studies has long been readily shared among researchers it has frequently been ignored by practicing architects. However, the language of the evolving discourse of evidence-based practice has connected design researchers to users of healthcare architecture (i.e., patients), in a way that has provided access to a powerful constituency of clients, (i.e., health care managers and institutional providers) (Ulrich *et al* 2004). As a result, practicing architects are increasingly attentive to this trend (Hamilton 2006).

1.3. Extending the argument in architecture

Whether this close initial association to healthcare issues is a necessary limit or just an initial circumstance is still unresolved. However, Sherry Ahrentzen's (2006) thoughtful attempt to extend the concept of evidence-based design beyond its application to healthcare is particularly instructive. She acknowledges that such an expansion may be limited by some of the differences between healthcare and other design sectors. Specifically, in reviewing institutional differences between her area of interest, affordable-housing, and the more centralized healthcare sector, she notes:

> This is a different animal from the housing industry. The latter [housing] is rarely institutional (prisons being one exception). Desired outcomes are less agreed upon, more diffuse, and sometimes minimally measurable. The historical base of the industry is geared toward profit making and efficient, expedient construction rather than the care mission that underlies the healthcare industry. Evidence-based design appeals to the scientific minds of physicians and other clinicians who are trying to practice on the

> basis of medical evidence. This may be a harder sell among housing developers and others in the housing industry (Ahrentzen 2006: 29).

However, these institutional differences do not deter her from making a case for an extension. She largely rests her hope on the insight that managers and owners in other building sectors are as concerned about reduced costs and improved organizational performance as are those in the healthcare industry. Ahrentzen, much like Ulrich, uses another concept from the healthcare sector to propose a new agenda for architectural researchers. *Translational research* "is the bridge between research studies and day-to-day applications." While this connection is useful as a rationale for increased support for applied research it makes some assumptions about an unproblematic and linear process that have proven to be subject to more scrutiny in another related literature. Social policy evaluators have been engaging in a discussion of evidence-based practice of their own, and in general they are less sanguine about the linearity of *translation*.

2. EVIDENCE-BASED POLICY

2.1. Policy and program theory

Public policy, like the healthcare and design sectors, has its researchers and its practitioners. There is an extensive literature on both the difficulty in making the connection between them and in the efforts to improve the situation (Lindblom and Cohen 1979). However, unlike in cases related to patient care, public policy objectives are often more nuanced and even convoluted. Hence the discussion in that literature has more explicitly attempted to understand how policy actors believe their intervention will affect outcomes. This assumed causal mechanism constitutes the 'logic' or 'theory' of the program: "If we do X, the outcome will be Y." Hence, an important part of evaluation research has become the explicit elucidation of this relationship. This has become known as theory-based evaluation (Rossi *et al* 2004, Shaw *et al* 2006).

2.2. Types of evidence-based policy

A recent review of evidence-based policy in the evaluation field identified two poles in existing practice (Pawson 2002a). *Meta-analysis* combines and reduces data from multiple studies at the price of nuance and possibly comparability. *Narrative review* compiles detail but offers little analytical guidance as to patterns and actor motivations across studies. As a corrective to these extremes Pawson (2002b) suggests a 'third way,' under the banner of *realistic evaluation*. He proposes that by reviewing prior studies with the purpose of determining the operative program theories, one could better determine patterns of success and failure based not merely on those variables the researcher chose to count, but more significantly on the causal mechanisms assumed by the social actors. Following Popper (1959), he argues that such an approach allows for a process of inductive falsification which in turn might lead to being able to "rule out" infeasible policy approaches without a large 'n' sample. While Pawson's approach, and its claimed connection to program theory, is not without its critics (Blamey and Mackenzie 2007), it does afford a model for developing an approach which might be applicable to a field which is more heterogeneous in its objectives than, say, medical treatments; and does not have a sufficiently high number of documented cases to assure generalizable conclusions.

2.3. Connection of program theory to design

Hamilton (2006) and Ahrentzen (2006) have individually argued for the extension of evidence-based practice to the evaluation of design. Their suggested approach to this is one in which the practitioner – in this case, the architect – becomes a better *consumer* of research, who eventually may 'grow' into being a *producer* of research. While such a scenario, if implemented, might increase the amount of data available for future studies, this transformation of the practitioner remains, at best, a distant hope. This is where Pawson's experience with the rapidity of the policy cycle, as opposed to the pace of the typical research cycle, might better serve those of us interested in architectural practice. While we need not reject the desirability of more and better studies to aggregate and analyze, we also need not wait until they are available.

One other aspect of Ahrentzen's research scenario seems closer to fruition. She proposes that practitioners often learn through 'cases' and supposed 'best practices,' but acknowledges that there is little consistency in what is documented and presented in these studies. However, noting that there are already some good models in existence in the design field – such as the Rudy Bruner awards and Business Week / Architectural Record awards – she suggests a promising typology of best practice documentation adopted again from the medical field and adapted to affordable housing design.

- *Evidence-based best practice*: exemplary affordable housing policy, program, or design whose outcomes are supported by comprehensive, valid and compelling research evidence (e.g., post–occupancy evaluation; use of evidence-based guidelines or programming) that substantiates how design reflects/fosters positive social, sustainable, and economic outcomes;
- *Emerging best practices*: affordable housing policy, program, or design that shows potential but whose outcomes are only modestly documented by research;
- *Promising practices*: affordable housing policy, program or design that has not yet been documented but is identified as promising by experts in demonstrating potential positive outcomes (Ahrentzen 2006: 32).

While not explicitly referencing the realist framework, this hierarchy creates a particular opportunity at the level of 'promising practices.' Here practitioners and researchers can begin to discuss how a practice is

intended to work to achieve its objectives. In this, the idea of program theory would be employed.

3. EVIDENCE-BASED DESIGN POLICY

3.1. From problems to cases

As an architect and scholar more familiar with historic preservation than either healthcare design or affordable housing, my examples for infusing the already developing discourse on *evidence-based design* with the insights afforded by *realistic evaluation* are from this field. A case in which I was a participant-observer is presented in outline.

3.2. Conflicting design ordinances

Boulder, Colorado is recognized as a municipal leader in sustainability, and its elected officials and managers have attempted to infuse this ethic into a variety of public policies. In addition to adopting stringent codes for new construction, the city has applied similar standards to renovation projects as well. Specifically, in the early 2000s the city adopted a point-based approach to best practices, named Greenpoints (*Greenpoints Program* 2009). As in many efforts focusing on making utilization easy, the guidelines for this program simplified ways of achieving the minimum number of points required to secure a building permit and eventual certificate of occupancy (COE). Installation of *new* windows resulted in a substantial number of 'points.' This provision proceeded in parallel to another municipal ordinance requiring a landmark alteration certificate (LAC) for modification to either individually designated local landmark buildings, or those located in one of Boulder's several historic districts (*Historic Preservation Program* 2009). Approval for such permits often required the retention of 'historic building fabric,' which can translate into a requirement to *not* replace existing windows, regardless of their energy efficiency. The differences between the two ordinances escaped close scrutiny until one high profile case caused an extensive controversy.

3.3. Incident and policy response

In 2004, one residential building owner in an historic district replaced their original single-pane windows with new double-pane windows, despite a decision from the landmarks board ordering them to keep the originals. The landmarks board ordered that the old windows be reinstalled. Before this occurred a "crusading" local journalist destroyed all the stored historic windows so that they could not be reinstalled. He claimed that this was to protect the homeowners and Boulder from this misguided "tyranny" (Roberts 2004).

The melodramatic aspects of the case aside, there were clearly vastly different interpretations of what was at stake in this case. To the city's credit, managers assembled a panel of five preservation and building performance experts to sort through the issues of energy conservation and historic preservation and make recommendations to the appropriate boards, to eventually be taken to the city council. As a member of this panel, what was particularly interesting in the ensuing process was the ease with which the panel agreed on the technical feasibility of combining sealing air leaks and storm sashes to adequately improve the performance of historic windows. We shared evidence, both in the form of case studies and aggregate data. We concluded that the retention of repaired historic windows did not *necessarily* detract from the goals of the Greenpoints program. In presenting our *technical* conclusions to city personnel, the reactions of the environmental staff, preservation staff, and political/policy staff were telling.

3.4. Three perspectives

The environmental staff needed to operate a program that was intelligible to homeowners and builders. Achieving a certain threshold of points was seen to be the simplest way to do this. This is an approach that has been used in other green building standards, including the United States Green Building Council's (USGBC) LEED program. Alternate means of satisfying requirements were seen as potentially confusing users. We can hypothesize that the environmental staff's program theory was that building owners (and their contractors) are willing to follow clear environmental guidance that is rewarded when it reaches the minimum threshold. These owners might rebel if the process becomes too ambiguous or complicated. The rebellion of citizen permit seekers might politically jeopardize the program, thus compromising the city's strides toward energy efficiency and environmental stewardship.

The preservation staff also had concerns about how the resolution of this controversy might affect the workings of their program. Historic preservation can be very nuanced, but when implemented as regulatory policy by local governments it also needs clear reference standards. The Boulder preservation staff and board relied on the *Secretary of the Interior's Standards for the Treatment of Historic Properties* as its reference, and indeed this is often considered the preservationist's canon. Retention of character-defining historic fabric is here considered essential. As a result, allowing other matters, like thermal performance, to be considered would require trade-offs between 'more' and 'less' important policy objectives. For preservationists, we might hypothesize that the program works because the principles are clear and defined at a level administratively 'above' local implementation. Preservationists warned that tampering with the standards might result in revocation of the city's status as a certified local government (CLG) under the National Historic Preservation Act (NHPA).

The managerial staff involved in this case were concerned that the public controversy be tempered and that public relations damaged incurred through media coverage of the window destruction case be mitigated. For them, we might hypothesize public policy worked in Boulder when it was perceived as progressive and forward-looking, while not seeming onerous or farsical. Reasonable debate and resolution were paramount.

3.5. Outcome

Since 2004, Boulder has revised its Greenpoints program to recognize window rehabilitation as a 'point equal' to replacing windows and modified its application for receiving a landmark alteration certificate to include a specific sub-application for window replacement. By developing a form that makes the point tallies for window replacement and rehabilitation equivalent, but stated separately and clearly, the process ideals of the environmentalists were upheld. Preservationists retained a clear reference standard, but added nuance and flexibility by creating a hierarchy of importance for different faces of the building. Street facing facades are 'primary,' side facing are 'secondary,' and backs are 'tertiary.' Alteration certificates for, say, backside patio doors are now more likely, without compromising *the standards*. The ordinance revisions have coursed their way through the legislative and rules processes without too much additional public acrimony, satisfying the policy managers.

4. CASE OR EVIDENCE?

4.1. Learning from cases

As in the several award programs approvingly cited by Ahrentzen, the preceding case is salutary, but in itself it does not provide generalizable evidence for future design policy actions in other contexts. However, what it does possibly do is contribute to building a middle-range theory of how environmentalists and preservationists separately and collectively understand the existing building stock. It may form the beginning of a more systematic review.

> The basic idea of systematic review is to draw transferable lessons from existing programmes and initiatives. Realist synthesis assumes that the transmission of lessons occurs through a process of theory building rather than assembling empirical generalizations. …Each of these begins with the notion that programmes are conjectures taking the form, 'if we apply programme X this unleashes process Y, which will result in Z'. The task of evaluation by these lights is to gather evidence to see if the process occurs as planned and, if it should not, then to amend the theory to account for the divergent outcomes. Realist synthesis accelerates this process around many, many cycles with a systematic review of an ensemble of different programmes purporting to use the same underlying mechanism. Knowledge resolutions occur as follows. The process starts with programme A, which we discover works in certain expected ways for certain subjects. We accept these findings not only because we are able to show the appropriate correlation but also because we are able to produce a theory of how it works. We then take this explanation to a second programme B, which works ostensibly using the same programme theory (Pawsonb 2002b: 347).

4.2. Transferring explanations

Some months after the above case I had the opportunity to sit in on meeting held at the National Trust for Historic Preservation in Washington, D.C.. The purpose of the daylong conclave was for Trust staff to query preservation professional about positioning preservation's agenda within the environmental movement. Of particular concern to several staff members was the USGBC's relative silence on the particular issues of historic preservation in meeting LEED certifications. Having made the claim that "the greenest building is the one that is already built," Trust policy advocates realized that evidence was needed if more that those who already believed in preservation were to be enlisted in its cause. What was remarkable about the conversation that ensued was the similarity of it to the characterization of the two poles of evidence-based policy described by Pawson (2002a). Some argued for what could be considered a meta-analysis of previous studies; although most admitted that there was not much valuable data available. Others pointed to the growing body of best practice cases; although they too realized that many lacked comparability and rigor. What was not discussed that day was a 'third way' akin to realistic evaluation.

4.3. Does Washington look like Boulder?

What if the concerns of the National Trust staff were comparable to those of Boulder's preservation community? and those of the USGBC staff paralleled those of the Colorado environmentalists? Then say, that the concerns of managers and directorates at both national organizations might look like the concerns of Boulder's political leadership. Is this plausible? Is it falsifiable? At this juncture the answer to both questions is contingently 'yes'. So, why not pursue the evolving program theory through this case. Hence, rather than blindly attempt to resolve all doubt about the ability of preservation to provide sustainable outcomes through the amassing and aggregation of meta-data, or simply accumulating anecdotal accounts of 'successes,' ask whether or not there is a patterning of assumed causal relationships along the lines of what occurred in Boulder.

CONCLUSION

Evidence-based practice affords architectural researchers a compelling touchstone for our own endeavours. However, rather than assuming that complex architectural problems are 'just like' medical treatments we may benefit from broadening our review of the evaluation literature to better understand how evidence is being used and developed at the policy level. Public policy research may afford design researchers one such complement to what constitutes evidence in the field of medical treatment. Hence, without abandoning the potential power of evidence we may find ways of making it more realistic in our particular practices.

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