Judgement in the design of houses: explanations by architects for design decisions

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ABSTRACT: This paper reports a view of judgement during the architectural design process that emerges from architects’ talking about their work, primarily in a series of interviews with the architects of houses that have won Australian State or National RAIA Awards for Architecture. It addresses the bases of the architects’ design decisions and how decisions about environment and sustainability relate to decisions about other aspects of design. The paper examines three questions: How much is the act of judgement overt in the way designers talk about their work? How much do they appear to consider options and judge between alternatives? How much do they refer to criteria and bases for their judgement? The results highlight that design is a multi-faceted process in which judgements are made based on the simultaneous fit of a design choice with appropriate responses to a spectrum of design objectives. The paper suggests that it is not appropriate to judge design with the single factor view inherent in many existing regulatory and environmental assessment approaches.

Conference theme: Building case studies, human issues
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INTRODUCTION
Current efforts aimed at reducing the environmental impacts of buildings, including the Building Code of Australia Energy-Efficiency provisions (BCA 2006), the Green Star rating scheme (GBCA 2006), and a variety of design guidelines, for example Your Home (AGO 2003) imply a degree of intentionality on the part of architects to deal specifically and individually with single factor issues. A previous paper by the authors (Soebarto et al 2006) suggested that for building regulations the “paradigm focus on physics, engineering and economics fails to account for the predilections of the human occupants of houses.” Does this paradigm connect any better with the predilections of the human designers of the houses? Is this really how architects think about their buildings and act in designing? In this paper we consider the ways in which architects exercise judgement during the course of designing a house, quoting primarily from interviews with architects of houses that have been recognised in the Royal Australian Institute of Architects award system.

We aimed to examine three questions:
(1) How much is the act of judgement overt in the way architects talk about their work?
(2) How much do they appear to consider options and judge between alternatives?
(3) How much do they refer to criteria as bases for their judgement?

Building science and most building design advice is fundamentally reductionist, a paradigm that if not matched by the way designers think and work is most likely flawed. The research approach we adopted is constructivism. We sought answers to the above questions by interviewing architects and we drew conclusions from their comments. In these interviews we did not just focus on environmental issues, or on any other category. Instead, responses to issues were allowed to emerge in a broad context of the architects’ multiple design intentions. Equally, we did not begin with a hypothesis about how award-winning designers do or should make their design decisions; nor did we take the point of judging their responses. Rather, we considered all responses to be valid in their own right. In this paper we describe and illustrate with quotations the structure of architects’ approaches and how they made judgements on matters of obvious relevance to environment and sustainability, such as design, form, siting, choice of materials and impact on internal climate.

The interviews were conducted between 1998 and 2005 and most were recorded. In a few cases the quotations presented in this paper were taken from the architect’s words in publications, recordings or public lectures, in which cases the sources are referenced. Due to space limitation only a few responses are reported in this paper. Those architects included in the research include many well-known and respected architects: Rex Addison, Brit Andressen, Gregory Burgess, David Burton, Lindsay Clare and Kerry Clare, Bruce Eeles, Peter Fletcher and Greg McNamara, James Grose, Phil Harris, Timothy Hill, Ken Latona, Richard LePastrier, John Mainwaring, Glenn Murcutt, Gabriel Poole, Max Pritchard, Simon Scully, Peter Stuchbury, Nick Tridente, John Wardle, Geoffrey Warne, Elizabeth Watson-Brown and Peter Skinner, and Adrian Welke. In this paper we have left quotations in their spoken form or as altered by the speakers themselves on transcripts they were sent for verification, preferring the immediacy of spoken language to our own interpretation of a ‘grammatically correct’ prose.
1. JUDGMENT IN DESIGNING

Donald Schö'n characterised professional activity as ‘reflective practice’ (Schön 1982). The word ‘practice’ comes from the Greek praxis and its exercise involves what the Greeks called phronesis. Snodgrass and Coyne (2006) describe the Greek understanding of praxis and phronesis. Praxis was
....an activity involving judgement. It is the making of ethical decisions by the exercise of phronesis...acting by way of tacit understandings gained from experience and within a context of ethical behaviour, by which was meant behaviour that is conducive to the well-being of oneself and others.

Schön observes that practitioners are frequently embroiled in conflicts of values, goals, purposes and interests (Schön 1982 p17), yet an experienced architect knows what to do in a given situation. Phronesis (knowing what to do) is the practical expression of professional knowledge. Schön (p24) argues that professional knowledge has three components:

1. An underlying discipline or basic science component upon which the practice rests or from which it is developed.
2. An applied science or ‘engineering’ component from which many of the day-to-day diagnostic procedures and problem solutions are derived.
3. A skills and attitudinal component that concerns the actual performance of services to the client, using the underlying basic and applied knowledge.

Schön continues to argue that the particularities of a situation and its boundaries impose a contextual coherence that allows a professional to judge what direction to take. "Problem solving is a process in which we name the things to which we will attend and frame the context in which we will act" (Schön 1982 p40).

The interviews, as expected, confirm Schön’s characterisation of reflective practice. Architects typically appear to perceive design as an experimental process, approached through a combination of naming and framing, patterns, metaphors and precedents. The interviews suggest that the making of implicit or explicit judgments is an integral and usually tacit part of these strategies and not perceived as an identifiable specific task.

1.1. Naming and Framing

One of the distinguishing features of design problems is that they are potentially universal in scope. Designers must find strategies to make them manageable. An architect’s store of images based on their experience and ideas about housing, environmental issues, and the nature of design will be an important determinant in how he or she frames the context of a new project. This “naming and framing” encapsulates the way the project is seen by the architect.

"What is the idea?” you might say. Well, the idea, I suppose, is that it's one room which is part of a greater room. … That's the first thing. And it's got to sit somehow within the orchestra of that place... (LePlastrier 2003)

The project is really about looking at what sort of cheap and economical way to make simple dwellings (Scully 2003)

This house is a series of details. The construction of it is the detail, because of the budget. (Kerry Clare 1999a)

The framing is used in describing the project to others, especially the client:

But everything that we put to put them was based on ... these notions we have about air flow and about lifting things off the ground, about lightweight construction, about cross flow, about basically providing lots of roof areas to provide cover from the rain and the sun. (Fletcher 2003)

This naming and framing limits the range of judgements that might be made and is an extremely important part of the process. Without it, there are infinite possibilities. It sets the context for the ways that design form is created and seen. It suggests the patterns and precedents that are appropriate to adopt.

1.2. Patterns, Metaphors and Precedents

Christopher Alexander sets out a ‘pattern language’ of design forms that correspond with design situations (Alexander 1977). None of the architects refer to the concept of a ‘pattern language’, but many refer to patterns drawn from nature. Such patterns often connect strongly with images of the environment. Murcutt’s citing of the tree canopy as a pattern for his architecture is well known. LePlastrier is eloquent in comparing his own house with a tree:

Sitting underneath the trees—like it's a canopy. …..To sit under a tree with the overhanging branches and looking down at the river is a lovely thing to do. ….. That's what we tried to do with this little house. The core room is actually the trunk of that tree, hence its structural frame is quite clearly expressed and you look through it like a framework. But the branches are just the big overhangs, which are up to 10 feet. They overhang like the branches of a tree. (LePlastrier 2003)
Patterns are also drawn from nature through the intermediary of other architectures that are seen to respond well to nature:

I do a lot of work out in Aboriginal communities. Throughout Arnhem Land particularly … really beautiful type constructions there. Slightly elevated above the ground. About six feet up and then a series of timbers that run across as a floor level. ... And then people sleep up on those platforms, but down below they’ve got a sheltered area, like a fire to cook on. The smoke from the fire goes up through the building and wards off mosquitoes. They are up, so they are up in the breeze. They are sheltered by shrubs and bushes. And they are really beautiful buildings. (Scully 2003)

None of the architects cited a particular building as a precedent. Other architects or styles are very occasionally cited, usually iconic figures of the modern movement, either as models or to illustrate a point of difference:

The architecture that has influenced me most has been Alvar Aalto in Finland … architecture from the heart, from the spirit. (Grose, 1998)

We tend to use Bauhaus-type architecture … we tend to be quite pure about it. ... Very simple (Tridente 2005)

So we’ve centred her house around an activity, as opposed to an object. … [In Frank Lloyd Wright the thing of focusing a house around the hearth, being this fireplace. Well, rather than take it as an object, like a fireplace, we took it as an activity, like a quality of life. (Warne 1999)

Usually, though, the transcripts of the interviews read as if the architect is working alone with no greater profession around him or her. The broad body of corporate knowledge and experience is simply assumed.

1.3. An Experimental Process
Because each project is different, architects have to discover or rediscover much themselves. A common theme in the interviews is the association of design with experiment. The essence of design was depicted as innovative, experimental work: “that’s how architecture happens” (Poole 1998c). Houses are special in providing an experimental base for larger buildings (Mainwaring 1998). They encapsulate all the kinds of spaces – public and private – of much larger buildings, and are seen as a laboratory, offering many opportunities for experiment. They can also be used to investigate a continuing research agenda.

The things that we brought to it were an interest in trying to prove that this sort of infill housing is a legitimate target that is often poorly done. (Hill 2003)

Architects’ own houses are disproportionately successful in RAIA awards processes. Architects designing their own houses take risks that they would not take when designing for a client.

When I’m doing a job this way and sticking my neck out a long way, although I’ve done a lot of details, I haven’t done everything. Because it’s experimental. So I am drawing as we are going and that’s a bit of a luxury when you’re doing your own house. (Addison 2003)

They also take more risks in the process with their own home, taking the design process well into the construction process:

… when you do your own house, well you’re going to have trouble getting documentation, it’s very scrubbly scratchy documentation, generally about one and a half days ahead of the builders the whole way through it. I would turn up on a morning with a new set of drawings and a very frustrating process for me and particularly and for them, but it then give you the creative advantage of responding to the process. (Wardle 2003)

1.4 Pragmatic Justifications
The most common justifications made by the architects for their design decisions are pragmatic, connecting with Schön’s second category of professional judgement as a straightforward applied science component from which day-to-day diagnostic procedures and problem solutions are derived. Usually this justification is functional:

A lot of it was just solving practical problems. … [T]he original scheme had a car park down the street and you had to walk up twenty-one steps to get to the front door, so it would be impractical with shopping or young children or whatever. It’s actually internalizing many of those things. (Wardle 2003)

Some very pragmatic design decisions. Mono-pitched roof. Easy to build—big gutter at the end so if it overflows, it’s out the back. Really simple finishes. Big sheets of timber—plywood. You’ll notice it all goes together in a very practical way. They’re kind of using pragmatism as really a source for decision-making, and just seeing if you can work within a very pragmatic and practical framework. (Warne 2003)

The roof shape was chosen to eliminate gutters which would be prone to blockage by leaves, whilst still providing for collection of roof water. A square roof dips to form a diagonal valley which continues out from the building as an aqueduct to the rainwater tank. (Pritchard 1999)
But pragmatics and function are not the only criteria. Harries (1997) refers to the need of an object both to work and to look appropriate, for functional responses to be made within an existing codification. Architects refer to the manipulation of space and form in their own terms, without necessarily resorting to practical justifications.

One needs to impose controls on the space. These can be created by the rhythm of structural form, objects suspended in the space, room dividers, the play of vertical and horizontal lines in detailing, the design of fixed furniture, the selection of colours, the selection of appropriate materials to maintain simple clean lines and the relationship between those differing materials. (Poole in Walker, 1998)

An example in more detail of how a design develops in relation to a complex overlaying of specific situations and general order principles such as grids and axes is provided by Wardle:

So the dimensions are an important sequence of series. The cross section, though, comes across to link our grand piano, which is being restored at the moment; it’s a beautiful grand piano that is very precious to us, so it was designed from that…. Well, the only section curved is this small section of wall through here, because we were coming out, just glancing that 4.5 metre zone from that Scottish elm, and then realigning with the view out here. Whereas this wall, which is the absolute center of the longitudinal axis wall, so there is a cross axis along here; it comes down and it has to then miss that one, and then it actually curves through the hallway, so it’s a constant curve from here right up to the window to get this asymmetry…. Then the only windows in these side walls - because generally it’s a very simple, I like whole walls of wall and whole walls of window - but these slices were taken so the reasons for this geometry becomes apparent internally. So there’s right on the axis of that tree, this window and right on the axis with that tree, … the disciplines used, it’s not just to be nice to put a window compositionally in this area of wall, it’s actually saying well here is the theory behind the form of the building and it’s sizing and we’ll stick rigorously with that. (Wardle 2003)

Wardle’s mention of ‘theory’ in this extract is rare. The words and writings of critics or designer-writers are not cited by architects in the interviews. Murcutt has referred elsewhere to the influence on him of Henry David Thoreau’s advocacy of simplicity in his ‘Walden, or Life in the Woods’, but the philosophers and theoreticians that are prominently cited in journals and conferences on the theory and history of architecture are not acknowledged. This does not mean, of course, that the influence of theory does not impact on their work. Peter Fletcher explicitly acknowledged the importance of guiding principles:

It’s the principles that underpin these things that probably keep you moving in the same direction. The resolution of principles might change here and there. And it always does, I think it should. … Whilst a lot of the … of the ideas, in my opinion, when you do something spontaneously, are often the right way to go really (Fletcher 2003)

1.5 Judgment and The Environment
The site, environment and response to the environment are the frequently cited justifications for design decisions.

Ventilation is promoted with the rooms being separated and having fanlights, double doors and louvres. Air was drawn through the roof space by black-painted turbine ventilators. Ceiling screens allow the internal hot air to be extracted from the room. On hot still days, the immediate air adjacent to the black vent will heat up, promoting the induction/extraction effect. (Hall 1990)

A concern for environmental issues does not necessarily mean a belief that sustainability is a separate matter.

It’s very current at the moment, and it has been for a couple of years—the green design, et cetera—but I can’t really see what the fuss is about. You should just do that anyway. I think all your design decisions should be sensible and wagered against a range of criteria. Climate is clearly one. We have hot summers and some of our winters get a bit chilly, and your house needs to work for that. (Warne 1999)

1.6 Choices of Materials
The most explicit justifications in the interviews are about the choices of particular materials.

[Steel] allows us to provide something which is an incredible spidery frame that is not liable to rot. (Welke 2003)

… Cyprus pine is a material that we used as a flooring material for reasons that the white ants won’t eat it, they won’t touch it. And it’s also a relatively cheap floor material. It’s coming out of Queensland, it’s not coming out of the Malaysian rainforest. And also it’s got that texture in it … But it is a very durable timber. (Scully 2003)

If you put light weight buildings up in the sun they fall to pieces. So we’ve been working using this logic of wall-building out of a technology of the rendered blockwork, as much as anything because it’s a material that you can use both inside and outside and its entirely self-protective, so even though there is some illogic in using it, its permanency is one of the things that interests us as a sustainable system. (Hill 2003)
The hardwood that I have used in the single skin, I’ve used the plywood as a module. And so they are four feet apart. So I’ve had approximately 1/3 the number of studs you normally have in a house. And so I’ve used the timber fairly resourcefully. And I’ve used the plywood because it’s a better use of the timber resources. (Addison 2003)

Hardwood is a wonderful material but has to be worked green. Must allow for shrinkages; [there is a] way of thinking about shrinkage and a way of thinking about twisting and warping. (Andressen 1999)

[We used] radial sawn timber for the cladding …It’s a Victorian hardwood. Plantation grown where we can get it. But you can use small diameter logs that have been retrieved from the forest floor rather than cutting down big trees. [It’s] about 80% efficient compared with about 40% for normal sawing. (Burgess 1999)

Mud brick – I wanted a texture of rough brick rather than the smoothness of rammed earth – painted with a special paint from Victoria. (Grose 1998)

Timber’s so beautiful. The more you use it, the better it gets. There are very few materials like that. Leather’s another. (LePlastrier 1999)

These judgements about choices of materials are typically based on multiple criteria. This is more explicit in the following longer extracts.

I like to try and keep the material direct, simple, cost-efficient, uncomplicated. We did one [with] in-situ concrete walls, but that was too expensive so we went to concrete block. Bagged. Concrete for me is good with thermal mass but it’s also, you can put floor heating in it and also it’s a very serviceable material. So I don’t like planning a lot of nonsense in a house, but its nonsense that has to be maintained or cared for or whatever. (Stutchbury 2003)

We pretty much stay within those domestic materials—or low budget commercial building materials, like fibre cement, metal decking. We might use an industrial metal decking to replace the domestic corrugated iron on occasions. And just rearrange those simple and cheap materials in a slightly different way. Occasionally we have a bit of an exotic material—maybe some timber flooring. We use that where we can for the qualities in sound and colour. That’s about it. We haven't used any other particularly exotic materials. (Warne 1999)

Stutchbury describes how a client is engaged in the process of choices for fixtures and fittings...

We tried as much as possible to infuse our own designs into light fittings for instance. Generally we fit quite a few in or otherwise, minimal light fittings with maximum effect, so usually … an up-lighting onto a ceiling or something, and then functional lights. I’m not a great supporter of the decorative light. I don’t understand it and I think a building reads a lot better with functional lighting, in terms of what it does and how it behaves and who it is and all that sort of stuff. … Taps and toilets and that, we're developing a range of options for clients but generally my advice to clients, and I try to let the clients become part of the process by selecting those items with guidance, but generally my advice is very, very simple, low key, non-issue fittings. I like the idea of a wall hung toilet because it’s a very inoffensive sort of sculptural proposition whereas a toilet with a cistern is something awkward about it. (Stutchbury 2003)

2. DISCUSSION
We stated at the beginning of this paper that our aim was to respond to three questions. Analysis of the interviews provides us with answers to these questions.

(1) How much is the act of judgement overt in the way architects talk about their work?

These architects rarely use the word ‘judgement’, but the way they talk about their own work is redolent with confidence about their professional judgement. Schön’s three categories of underlying basic discipline knowledge, pragmatic applied knowledge, and an attitudinal component are illustrative of how basic and applied knowledge is directed into decision making. If explicitly asked, they have ready justifications for their judgements.

(2) How much do they appear to consider options and judge between alternatives?

There is very little reference in the interviews to the consideration of other ways of ‘doing things’ than the adopted design. The stance is one of confidence in the outcome. However, there is much reference to the experimental nature of designing, positioning design as research and implicitly recognising a search for ‘better’ design outcomes.

(3) How much do they refer to criteria and bases for their judgement?

There are broad criteria that provide the context for architects’ judgements, rather than enumerated criteria for individual decisions. The most important of these criteria relate to environment, site, constructability, budget and the clients’ expressions of desired accommodation. Decisions are justified by rational and functional reasons. However, overlaid on these decisions is a less tangible set of objectives about space, form and aesthetics. Although rarely expressed, they are always present. The architects simultaneously and consistently map decisions that can be...
justified in pragmatic, practical terms on to design forms that they judge to be aesthetically acceptable. This mapping is central to the work, in the way the project and its details are named and framed to the designers themselves.

These less tangible aesthetic objectives and the ways that architects respond to them are the core components of their various individual languages or styles. In the interviews there are no references to language or style, although there are very obvious personal languages and styles exhibited in their design work. References to personal ‘ways of doing things’ are rare and tend to refer to details rather than buildings as a whole:

A white, we tend to use white as bright as we can until we get a client that doesn’t like white, so we put a touch of off white in it, but it’s essentially white because we believe it’s a palate and you can add to it. (Tridente 2003)

I hate designing balustrades and where possible use furniture as balustrading. (Wardle 2003)

A relatively small number of names of architects and architectural practices recur in the lists of National and State award winners in the residential category (and, indeed, in other award categories). Just as Schöni argued, architects build up a repertoire of design patterns and approaches that they take with them and refine. Each project draws on its predecessors, and the gradual process of refinement is almost a prequisite for success in the awards scheme.

I think it also reflects other projects we’ve done over time. The award tends to go to people who have a body of work (Warme 1999).

Our experience in this research is entirely consistent with Schöni’s summary of a professional’s application of knowledge in judgement.

Whenever a professional claims to "know", in the sense of the technical expert, he imposes his categories, theories, and techniques on the situation before him. He ignores, explains away, or controls those features of the situation, including the human beings within it, which do not fit his knowledge-in-practice. When he works in an institution whose knowledge structure reinforces his image of expertise, then he tends to see himself as accountable for nothing more than the delivery of his stock of techniques according to the measures of performance imposed on him. He does not see himself as free, or obliged, to participate in setting objectives and framing problems. The institutional system reinforces his image of expertise in inducing a pattern of unilateral control. (Schön 1982 p345-6)

The architects see themselves as very much in control and responsible for the judgements made. They do not claim they were forced to make decisions they did not want to make. They take responsibility for the judgements and hence for the design results. They are confident of their expertise and their right and obligation to make judgements using their expertise.

Looking back, the architects see the projects as a stage in their still-developing professional knowledge, supporting again the argument that design at the level of award winning buildings is always a kind of research.

It’s one of our landmark buildings and, mind you a lot of our buildings have that sort of proposition really, but it’s one of our landmark buildings because it taught us much more accurately about the blend of solid and lightweight. It produced a cost-plus building on budget. It was our first exposure to technology within a house, so it educated us about all those fast systems, etcetera. It was a great learning curve on the value of a big space because that main room and bedroom is really one big space and it showed you the absolute glory that a big space can bring to a residential building. It minimised rooms and yet maximised emotions. (Stutchbury 2003)

It’s enabled us to explore certain ideas too. Push things a bit further than we might have normally had the chance to do. So from that point of view it’s been a great project. (McNamarr a 2003)

[It]’s actually been one of those series of projects that mark the development of a practice in a way. I also enjoy the fact that the opportunity took me away from the practice in a way. There is a very personal relationship that was allowed to work beyond the conventions of an architectural practice, it was really architect making, home making. (Wardle 2003)

3. CONCLUSION
In the beginning of this paper we raised our concern about the current move towards achieving sustainable buildings through the use of codes, regulations and design guidelines. We argue that these approaches, due to their nature of focusing only on physics, engineering and economics, have the potential to fail in achieving the goals as they deal specifically with single factor issues. From this research it is clear that design decision making including decisions about the environment and sustainability of house design is a multi-faceted and complex process. Judgements are made based on the simultaneous fit of the design choice with appropriate responses to a spectrum of design objectives. Every design decision is a move towards meeting many goals at once.

In Understanding Sustainable Architecture Williamson, Radford and Bennetts (2003 p217) point to the writing of Fredic Jameson and suggest that “in the most successful buildings the work appears aesthetically and functionally convincing, almost inevitable, as a consequence of all its disparate origins”. Award-winning houses have been
recognised as “most successful buildings” and the way their architects describe their design judgements is imbued with a concern for the design integrity of the whole house.

It is therefore a mistake to believe that improving the design of houses in relation to, for example, energy performance and water consumption, global carbon dioxide emissions, or any other environmental measures, is merely a question of architects being aware of the needs and adding appropriate, specified, design responses to their repertoire. To work without compromising the aesthetic and functional whole, the response to any specific issue has to be integrated into the architect’s personal design language. It has to become part of the way in which the design situation is named and framed. This is achieved through a process of development and experiments in which the designer’s knowledge and understanding develops during the making of designs. That is the essence of professional work as encapsulated in Schön’s reflective practice.

A concern about environmental impact is considered important by architects, but as one of many concerns and not as a separate or only important issue. Further, architects do not merely see the environmental aspect of design from the quantitative point of view, as inherent in the scientific approach of codes, regulations and design guidelines. Western afternoon sun, for example, is desired by many architects and clients due to its light quality, although design guidelines usually consider it as something to be avoided because of its potential impact in increasing summer cooling loads. Decisions on the building form, constructions and choice of materials are not based on their thermal or environmental performance alone, but are influenced by many objectives and bases for judgment.

The theme that emerges most strongly from the interviews is the way architects look for simultaneous fit in design decisions. They seek a fit with environmental concerns and with a myriad of other concerns at the same time. Prescriptive codes and regulations reduce the ability for skilled architects to achieve simultaneous fit in inventive, original, unexpected and potentially award-winning ways.

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REFERENCES


Hall, R. (1990) in Australian Architects: Rex Addison, Lindsay Clare, Russell Hall, Canberra: RAIA Education Committee, p92.


Poole, G. (1998c). Talk to RAIA South Australia Chapter, Adelaide, December.


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