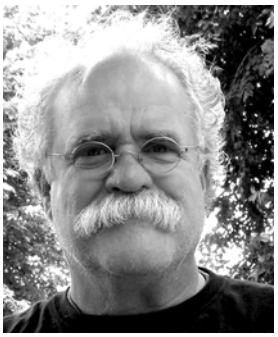

Greg Watson
Associate Professor of Architecture
College of Architecture, Art, and Design
Mississippi State University
gwatson@caad.msstate.edu

Biographic Summary

Greg Watson received his BA in Psychology from Columbia University and his M.Arch degree from Washington University in Saint Louis. He pursued graduate studies in social psychology at Saint Louis University and in studio arts at the Savannah College of Art and Design.

Greg has taught drawing and design at the Savannah College of Art and Design, the Maine College of Art, and the Minneapolis College of Art and Design. He has been an Associate Professor of Architecture at the University of New Mexico, and the University of Minnesota where he taught design, materials, drawing, and media studies at the undergraduate and graduate level.

Greg has received a number of teaching awards including the Tau Sigma Delta Outstanding Teacher Award, the Allen & Hoshall Award for invovations in the use of digital technology in the design studio, the MSU Honors Faculty Award, and the John Grisham Award for Teaching Excellence. In 2001 he was selected as the Nadine Carter Russell Chair in Design at Louisiana State University.

As an architect, he has practiced in Chicago, Maine, South Carolina, Mississippi, and Minnesota. His professional experience ranges from residential to large-scale commercial and institutional work. This includes several award winning school and university projects.

His paintings, drawings, and prints have been exhibited at galleries in New York City, Boston, Minneapolis, Mississippi, and Louisiana.

Title: **Conjecture in Design**

Cory Saft
Assistant Professor of Architecture
School of Architecture
College of the Arts
University of Louisiana at Lafayette
Fletcher Hall
Lafayette, LA 70504
csaft@louisiana.edu

Greg Watson
Associate Professor of Architecture
School of Architecture
College of Architecture, Art, and Design
Mississippi State University
PO Box AQ
Mississippi State, MS 39762
gwatson@caad.msstate.edu

Five Key Words: Speculation
Habit
Awareness
Risk
Fearlessness

Abstract

Meaning cannot be found in the reductionary analysis of systems at the level of fundamental propositions. Rather, meaning is a shifting and intensely personal phenomenon contingent upon a holistic and simultaneous consideration of the whole complex of factors related to a particular topic of human interest.
Ludwig Wittgenstein

Design is a speculative process. Its predictions attempt to bridge the gap that always exists between the representation of something and the thing itself. The fit is never perfect and it is largely within this disjunction that design occurs. Most beginning design students have little experience with this kind of conjectural and discursive process. In the hands and minds of novices, highly speculative work produces uncertainty that is suppressed by reflexively structuring their thinking in linear and reductive ways. This cautious, and largely unconscious, approach to managing subjective and ambiguous information reveals a considerable skill at avoiding risk. The typical results of this reflexive thinking are conclusions that are timid, familiar, and barren in terms of developing new knowledge or stimulating alternative threads of inquiry. A means of helping beginning students resist this type of control is to make them aware of these consequences and direct them towards more intentionally speculative ways of engaging the design process that embrace risk and accept error, not as failure, but as an essential and generative moment.
The act of speculation, the simple projective guess that precedes action, is accompanied by two basic tendencies. One, as noted, is to reduce input in favor of early clarity and maximum control over output. The other more threatening path is to increase potential input and short-term ambiguity in favor of the long term potential to detect and exploit richer and more complex conditions. One strategy seeks to reduce risk while the other purposely maximizes it. The first tends towards a deductive system of logic that is biased to carrying through an initial idea to its completion while the second tends towards an inductive system that constantly updates ones position as new assumptions are tested, a kind of Socratic soliloquy. The latter is confrontational and works on juxtaposition while the former is prescriptive and works on precedent.

Results & Conclusions

The sophomore design studio from which this paper draws its examples, used mixed media explorations and discursive analysis as a way to help students develop and evolve positions on their work in a critical and risky way. The students were introduced to ways of working which were conjectural and iterative in nature and provided a way of testing their work through verbal debate and comparative visual evidence. These graphic and intellectual explorations assisted the students in defamiliarizing themselves with the object just enough to establish a new vantage point from which to see and analyze their work. This new view revealed their preconceptions and assumptions and helped them develop a more critical and complex set of positions on not only their own work, but also the design process in general.

Introduction: An Anatomy of Beginning

The critical importance of a student's experience in basic design is difficult to overstate. It is within this all-too-small window that the attitudes, cognitive strategies, and work ethic that will influence the depth, breadth, and quality of a design student's education are formed. To be a novice is to be in a remarkable state. It intensifies and focuses a critical set of emotions, instincts, and intuitions that are fundamental to the development of a position on design. The most vivid moments of beginning oscillate between guileless optimism and paralyzing fear. It is a state of tremendous tension between the simultaneous potential of success and failure where even the most mundane decision become charged with great risk. Within this threshold we find ourselves at our most vulnerable and our most receptive. For these moments to happen, and to be sustained in the most positive and productive way, we must reconnect and understand what it means to be a beginner.

> **"It ain't what you don't know that gets you into trouble. It's what you know for sure that just ain't so."**
> **Mark Twain**

What Twain is referring to, of course, is an all too familiar condition of human consciousness. This observation takes on a special vividness when considering the specific condition of being a novice who, by definition, does not know what they do not know until they know it. For the beginning designer, this fact is paired with the belief that the subject of design is a well-formed body of knowledge grounded in a set of basic and teachable skills. This naiveté is extended further by the expectation that this knowledge and these skills can be clearly, linearly, and largely passively, transferred from instructor to student. This is what most beginners "know for sure", referring to Twain's quote. In short, the creative act of design is, not surprisingly, expected to yield to the reductive problem solving strategies in which they have been well schooled. Novices predictably understand architectural design as a methodology for solving the "problems" of building, function, form and space as opposed to a complex, non-linear, loosely ordered interaction of intuition, preconception, guesswork, fact, and dumb luck. That last part is not taught in school.

In general, the cognitive style of beginners is a composite of several interconnected traits and behaviors. Perhaps among the most important is the habitual visual and cognitive habits that seek simple order and balance and through techniques of linear problem solving that seeks to reduce the number of variables in a decision making process. There is a synergy between the reflexive cognitive habit and the conscious and deliberate working method. The resulting design methodologies act to suppress complexity to reduce the probability of error or failure and, consequently, increase the manageability of the process. In other words, if the process can be stripped to a small number of simple choices preferably between things that can be quantitatively verified or that present a logical visual balance, the perceived risk of making an incorrect decision is, theoretically, reduced to near zero.

The evidence for the presence of this strategy is seen in the implausible similarity between the works of a room full of strangers.

> "Looking at representative samplings of student design work it is not difficult to decide

> that a large majority of architectural students (to say all students would of course be going a bit too far) but in numbers high on an asymptotic curve, approaching totality, that these students all appear to design buildings in exactly the same way. There is a pervasive, almost cloned, similarity apparent in the design work and in the design procedures that students employ in just about every American architectural school. The buildings look the same, the graphic techniques look the same, the explanations offered are the same and the specialized language that surfaces during critical discussions is as though tape-recorded from a central architectural concordance. In all respects a remarkable sameness prevails..."[i]

The strong patterns and habits within beginners' work, either intentionally or unknowingly, are reinforced by methods of design instruction that are aimed at tightly controlling the process and the product of the work. An obvious and still common example can be found in highly proscriptive basic design projects, controlled by "programs" that present lists of things, a corresponding size for each thing, and direct or subtle suggestions regarding their logical relationship of one thing to another. This "program" or "problem statement" is seen and responded to as a simple series of calculations that are logically, and incrementally, solved. The method represents a kind of simple decision tree:

A place to Read? Present/Absent? – Present. Correct –Absent – Create.
Size: 150 sq. ft.? Yes/No? – Yes. Correct – No. Revise.
Proximity: Near Bathroom? Yes/No - Yes – Correct – No – Move Closer

The dilemma created by this way of introducing beginners to design is that it presents a misleading model of what design process is specifically, and what constitutes creative work is in general. It suggests that architecture is a type of what educational researcher Rand Spiro and others refer to as "well-structured knowledge domains", which are fields of knowledge that are simply ordered by fact and logic, and are subject to low levels of variability. The information in these domains can be directly transferred, linearly presented and processed and are pedagogically identified by the traditional lecture format[ii]. Clearly, the nature of any creative process is at odds with this construct. What we deal with is more accurately characterized as an "ill-structured knowledge domain." Here "as content increases in complexity and ill-structuredness, increasingly greater amounts of important information are lost with linear and uni-dimensional" approaches to learning.[iii]

> "A common thread running through the deficiencies in learning is oversimplification. We call this tendency the reductive bias, and we have observed its occurrence in many forms. Examples include the additivity bias, in which parts of complex entities that have been studied in isolation are assumed to retain their characteristics when the parts are reintegrated into the whole from which they were drawn: the discreteness bias, in which continuously dimensioned attributes (like length) are bifurcated to their poles and continuous processes are instead segmented into discrete steps: and the compartmentalization bias, in which conceptual elements that are in reality highly interdependent are instead treated in isolation, missing important aspects of their interaction. Of course, the employment of strategies of this kind is not a problem if the material is simple in ways consistent with the reductive bias. However, if real complexities exist and their mastery is important, such reduction is an inappropriate

> oversimplification."[iv]

In order to enrich the beginning experiences of design education, it is important to recognize and creatively deal with both the bias of the novice designer and the bias of the instructor. This needs to be done to increase the depth and breadth of the student's understanding of the complex, ambiguous, and uncertain nature of design. To succeed at this is to reduce the fear and vulnerability that often warps the process of beginning and dulls the exhilaration of starting something new. It also allows for the development of greater curiosity regarding the outcomes of first trials, whatever those may be, ultimately overriding the fear of failure, however it's defined. In many respects this is the most important mission of beginning design education.

> "It has been interesting to notice over the years, and I've often been a little envious of the fact that architectural students seem to operate in an atmosphere of high certitude as they go about the business of building design. This confidence is of course not monolithic, but they exhibit very few disabling doubts."[v]

An alternative approach to basic design instruction that this paper proposes is structured to expose and resist biases, or habits of learning, that spawn an artificial sense of confidence and control and are motivated largely by the trained avoidance of error and fear of failure. This is achieved by introducing the idea of design as conjecture and designing as a speculative process. By doing so you introduce the idea that design is unavoidably and, more importantly, desirably engaged in risk and lessons of error. The strategy of structuring beginning studios explicitly around ideas of conjecture, improvisation, invention, intuition, and experimentation deny space to oversimplified, reductive problems solving biases and replace them with strategies that accept and constructively deal with the inherent complexity, ambiguity, and uncertainty of creative work.

The Process

> **"You don't see what you're seeing until you see it, but when you do see it, it lets you see many other things."**
> **Dr. William Thurston commenting on the solution to Poincaré's conjecture, proven by Dr. Grigory Perelman.**

The idea of conjecture and speculation applied to the work in our studios is relatively simple. An analogy commonly used is that of a mathematician faced with an equation with too many variables. The daunting uncertainty of this situation is dealt with in a calm and direct way. The mathematician makes a guess. He pretends he knows one of the variables and then watches the resulting behavior of the equation. He knows that the first answer is wrong, as is the second, third, and so on. His certitude is knowingly false. This process is reiterated with different variables until, for the purposes of our analogy, a refined field of possible answers is created in which there is a high probability that a "correct" answer exists. It is there, but you can only get close to it. How close you get is a consequence of how rigorous you are in the hunt, and how carefully you observe the process. The smaller the number of iterations the larger the field of unknowns, and consequently the lower the probability that the field contains something close to an answer, the larger the number of probes, the greater the probability of detecting an order within the field that may contain an appropriate answer.

The teacher's role in this model is to avoid contaminating the process before the student has had an opportunity to explore and struggle with it. The point is not to direct as much as it is to participate with the student in understanding what they have done, how they have done it and, very importantly, why has it been done in a particular way. This relationship to the students and their work requires a great deal of patience and a high tolerance to very awkward and unattractive evidence. Special care is taken to avoid "correcting" the student's work, particularly during their first tentative steps. The student must take and maintain full responsibility for the process, its intentions and its products. Needless to say, this can produce some very tense and anxious times for both faculty and students. The intended outcome is for the student to have gained adequate confidence in their ability to independently develop, order and pursue their own threads of investigation. This confidence and sense of responsibility ideally leads to work in which they are intimately invested and has meaning for them.

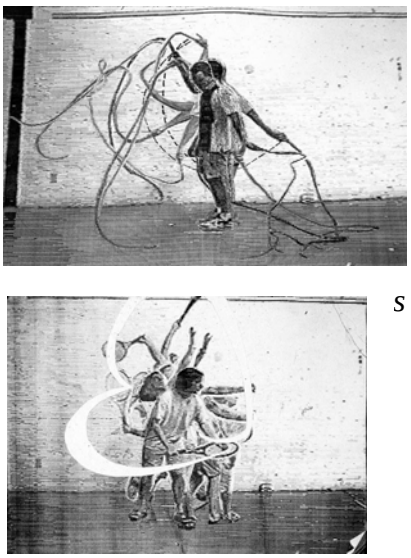

Figure 2-Collage of video stills – tennis serve

The Studios

The roots of this studio structure are in a project conducted with a small group of first year students during an eight-week summer studio. This was their first design studio experience. Given the length of the session, the studio faculty* designed a single project that would introduce the students to a common range of issues and skills through an uncommon exercise. The students were asked to study the motion of the body engaging in some activity such as kicking a ball, swinging a bat, cracking a whip, etc. This work was to be recorded on video as well as drawn live. These recordings acted as the construction documents for a life-sized machine that would accurately recreate the motion in all its important detail. The power source of the mechanical motion was gravity.

Figures 1-3 are samples of the initial observation and analysis. This work was created by extracting frames from the videos to distill and extend the time sequence. This process helped the students see the important transitions within the movements. These were moments of acceleration, deceleration, compression, bending, resistance, directional change, etc. These conditions where mapped and collaged with drawings and developed through modeling, material, and mechanical studies. The studio concluded with full size prototypes and the final machine.

Several important things were discovered in this work. One was the importance of the distance between this subject and the typical expectations of beginning architecture students that class would start with the design of a building. The absence of a familiar reference made reliance on habit and preconception difficult. Next, and somewhat accidentally, the faculty's own naiveté and uncertainty about how to structure this work freed the students to act more independently. Reviews were replaced by discussions of the work

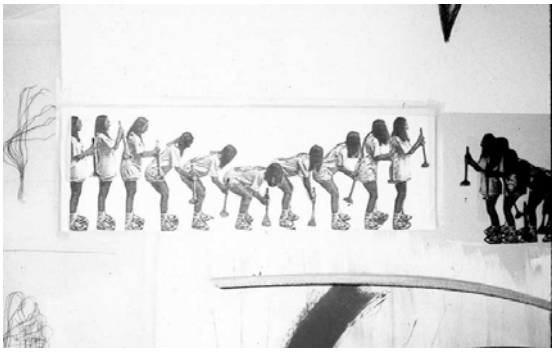

Figure 3. Collage of video stills – plunger

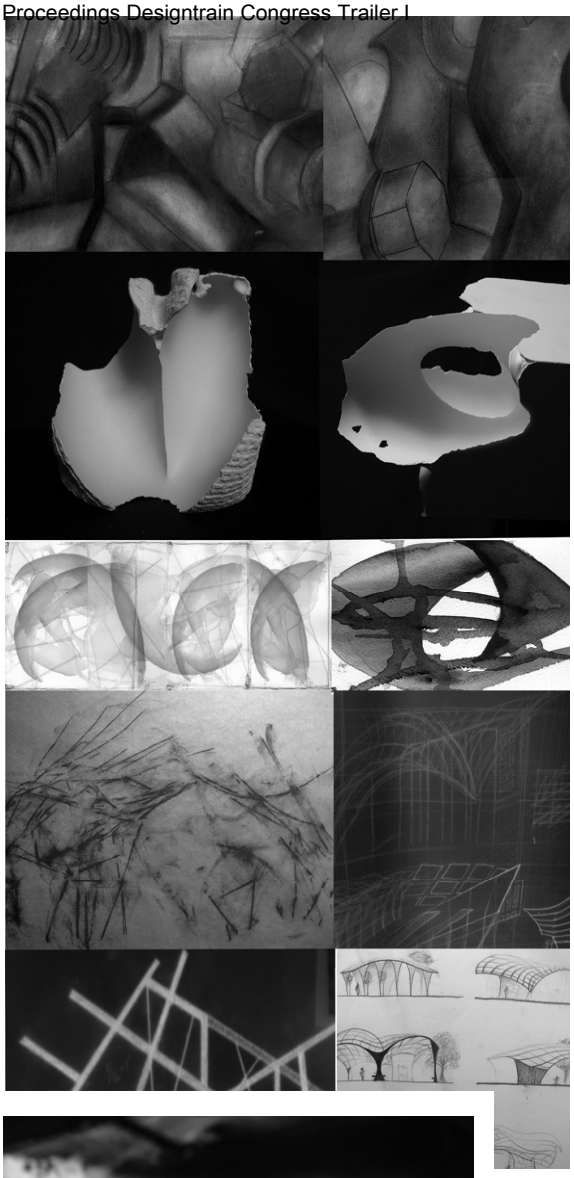

Figure 5. Vessel study

based on open speculation and questioning, since both faculty and students were learning about this process simultaneously. The importance of this change in the dynamic between faculty and students is significant. The boundary between expert and novice becomes very permeable and the iterative and conjectural mode of inquiry made necessary by the nature of this project blurred this distinction further. On reflection, this project revealed the scope and intensity of investigation possible when it is released from the constraints of reductive habit and expectations grounded in familiar things and reflexive process. This work provided compelling evidence of the value of conjectural and speculative methods, when paired with rigorous observation and recording, in bringing a workable order to complex and multivariate design projects.

The latest examples of work come from second-year undergraduate design studios. These students are in their first studio focused on architectural issues, having spent a foundation year in basic design with students from industrial design and interior design. The second year is structured as an extension of foundation design. The work continues to be conceptual and abstract in nature focusing on observation, design process and developing generative methods of inquiry. The students will not do their first “programmed” building until the end of their second semester.

The projects presented show a progression in the work, beginning with highly gestural work through a process of translation and interpretation, and concludes with a series of studies which attempt to bring forward a vivid spatial order. The media for this project is left to the student with the request that the process includes two- and three-dimensional work, and that at least two parallel investigations occur simultaneously. In other words, the work cannot happen in isolated blocks.

Figures 4 through 7 are selections of images taken from the first second-year project. The exercise was to stage a series of experiments that where looking for useful differences between the idea of a vessel and the idea of a container. The discussions and work centered on the generality of the idea of container versus the specificity that can be attached to the idea of a vessel. The intent of these investigations was to maintain some contrast between these notions of how space is defined and to keep the work ‘open’ to explore the threshold that exists between the

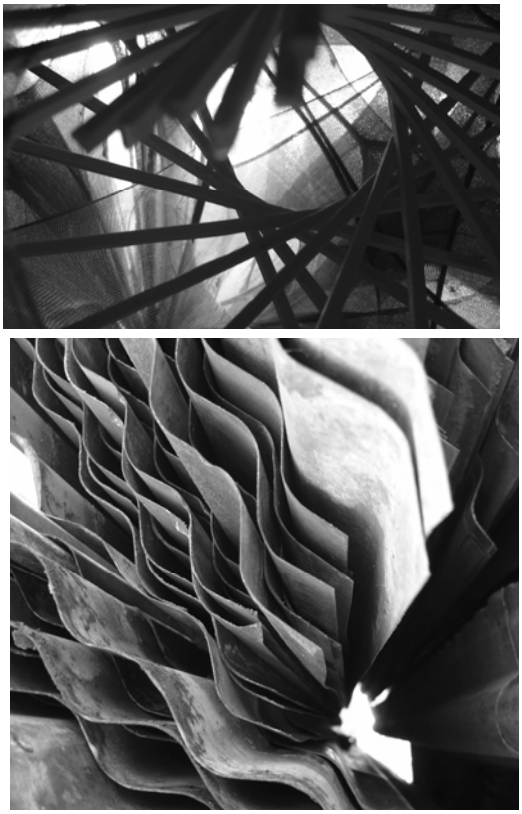

Figure 7. Found vessel

presence or absence of either condition.

These inquiries were conducted using drawing, photography, modeling, collage, and digital imaging. A significant part of the challenge was to maintain the experimental quality of the search by using a broad range of representational techniques. This structure is intended to reinforce comparison as a means of testing judgments based on visual evidence. These comparisons provide the framework for decision-making that moves the work toward ideas about architectural space and form.

The role of conjecture within these projects is critical to the idea of expanding rather than contracting the design process. The contrast between the words "vessel" and "container" cannot be maintained passively. Conceptually holding the meanings of these words apart provides the space for the iterations and comparisons that measures progress within the work. Conjecture of the type we ask the students to engage in takes discipline and work to sustain it and make it meaningful. If the student is not engaged in this search, the work stops, and it cannot hide behind facile images of buildings and diagrams of programs.

Conclusion

Simply put, this model of studio work is literally a form of child's play. It is present in a multitude of children's behaviors that attempt to order their universe until they learn how to fear mistakes. It is the difference between making judgments to understand and appreciate difference and making judgments to bring things into line. Based on this notion, it is implicit in this model that we are not dealing with something new and consciously calculated and constructed as much as we are trying to reconnect with something quite old and fundamentally innocent. In all, this studio pedagogy reflects a belief that design, as any creative act, is a densely complex, ambiguous and uncertain endeavor that is inextricably bound to risk and failure. It is not something that yields to the expedient. Design process is by nature inefficient. How students learn to design anything is directly related to what, and how, they learn from failed effort and their willingness to repeat the lesson. Because the alternative is to only do what you already know – and this is neither design nor a process. This is the essential character of creative work and strategies that attempt to expedite the effort, attenuate the doubt, or control the exposure to failure, deplete the worth of both the process and the product.

*David Perkes & Greg Watson, School of Architecture, Mississippi State University, 1st year summer studio, 1998

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[iii] ibid
[iv] ibid
[v] Fitzgibbon, *How Architecture Students Design*

Figure 1. Collage of video stills – whip, A. Lott
Figure 2. Collage of video stills – tennis serve, Cary Sweat
Figure 3. Collage of video stills – plunger, Tiffany Hatcher
Figure 4. Vessel explorations, Annika Miller
Figure 5. Vessel study, Dustin Rousseau
Figure 6. Vessel study, Dustin Rousseau
Figure 7. Found Vessel, Dustin Rousseau