METHODS AND STRATEGIES FOR BRIDGING

THE DESIGN PRACTITIONER - RESEARCHER GAP

_____

A Thesis

presented to

the Faculty of the Graduate School

at the University of Missouri-Columbia

_____

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

_____

by

J. SUSAN WAMPLER

Dr. Ronald Phillips, Thesis Supervisor

DECEMBER 2010

The undersigned, appointed by the Dean of the Graduate Faculty, have examined the thesis entitled:

METHODS AND STRATEGIES FOR BRIDGING

THE DESIGN PRACTITIONER - RESEARCHER GAP

Presented by Janet Susan Wampler

A candidate for the degree of Master of Science

And hereby certify that in their opinion it is worthy of acceptance.

_____

Ronald G. Phillips, Arch.D.

_____

Lynn M. Boorady, Ph.D.

_____

Newton D'Sousa, Ph.D.

ACKNOWLEDGEMENTS

First I would like to thank my graduate committee – Dr. Lynn Boorady, Dr. Newton D'Sousa and Dr. Ronald Phillips - for their patience, advice and support. With a special "thank you" to Dr. Phillips for sticking with me through the duration of this journey, and for expanding my knowledge base ("knowing"), and for introducing me to the concept of how to gain a broader perspective on any given problem - "walk all the way around the tree"!

I would also like to extend my "thanks" and appreciation to Fred Schmidt and John Merrill whose thesis and dissertation, respectively, were an inspiration and a wonderful guide.

Finally, I would like to thank my family, friends and colleagues for their support and particularly for never saying "Aren't you finished yet?!?!"

TABLE OF CONTENTS

Chapter

LIST OF TABLES

LIST OF FIGURES

METHODS AND STRATEGIES FOR BRIDGING

THE DESIGN PRACTITIONER - RESEARCHER GAP

J. Susan Wampler

Dr. Ronald Phillips   Thesis Advisor

ABSTRACT

Societies are evolving into a global community by means of new and ever
changing technology. Designers, more often than not, are required to make decisions that
impact the way people live and, once made and put in to place, the clients or users are left
to live with the consequences for years to come. Designers – practitioners and researchers
– agree EBR (Environment-Behavior Research) can provide them with the means to be
competitive and also lead to increased status of the profession as evidenced based versus
just an art form.

To date, a significant number of studies have been conducted and results
published about the use and the importance of EBR by the design practitioner. While
architects show a desire for behavioral research information and have a great interest in
designing for people – showing an awareness of the potential impact of EBR on their
work – they rarely use it. As Lawson (1980) pointed out, the social sciences are primarily
descriptive, while design is necessarily prescriptive, resulting in a mismatch between the
strategies used by the two professions.

If designers are to retain their competitive advantage in this community, the need to accommodate and change is its first challenge. It is imperative that architects, designers, researchers and educators collaborate on the best way to handle the communication of and translations of EBR and begin to implement strategies towards this end. The progression of this topic – from identifying a need for EBR in design to acknowledging the need to bridge the application gap – has gained new urgency.

The goal of this thesis is to confirm there is a continuing application gap by identifying current attitudes of design practitioners to the usefulness of EBR, preferred forms of communication of EBR, and reasons for lack of use of EBR. To achieve this goal, a survey instrument was developed and distributed to practicing architects whose demographics closely mimicked those from a previous study by Schmidt (1984). Responses were recorded, confirmed, transformed in to statistically significant sets then analyzed and compared to like data sets from two previous studies on the application gap – Schmidt (1984) and Merrill (1973).

The study findings provide insight in to the perceptions held by practitioners about EBR – specifically its usefulness, preferred forms of communication, and why they may not use EBR. These findings, when compared to two previous studies by Schmidt (1984) and Merrill (1973), and supported by findings from Karpan (2005), show little change in attitude of design practitioners towards EBR – they believe EBR useful but rarely use it. The implication of the results from the current study suggests further study needs to occur before this application gap can be bridged. Suggestions on how to bridge

the application gap are included in this study and range from support of suggestions from

Schmidt, Merrill, and Karpan as well as proposing new considerations.

Chapter One

INTRODUCTION

Statement of the Problem

By the very nature of the design profession, designers – for the purpose of this study, "designer" includes architects, interior designers and landscape designers – are required to make decisions that impact the way people live. Often, once these decisions are made and put in to place, they are literally set in concrete leaving the user to live with the consequences for years to come. Because of the long term implications of decisions by designers, great importance and accuracy of information gleaned during the design process is paramount to the decision making process. In the past, such decisions were based on information obtained by the designer from the client and knowledge gained by the designer from past projects – theirs or from pattern books developed as a guide for well building. In today's fast changing, technology driven global society, the need to obtain information on user requirements and needs has become more difficult as well as more critical.

In the mid-twentieth century, a new field emerged which is directly concerned with the relationship between human social and psychological needs and elements of the natural and built environment – the field of environment-behavior. Although, environment-behavior research (EBR) has gained recognition and empirical data has been translated into useable processes and procedures, its use is often limited to a few who are required, by regulations and codes; such as post-occupancy evaluations, to use it. Findings from studies by Merrill (1973) and Schmidt (1984) – *Improving the Behavior*

1

Basis of Environmental Design, and, *The Preferences of Practicing Architects for the Communication of Environment Behavior Research Information in Design*, respectively – show there is an application gap between the design practitioner and the environment-behavior researcher. If designers are to retain their competitive advantage, it is imperative, in this ever changing, technically savvy global society that demands their environment not only meet their needs but by way of compliance with required building regulations and codes, that architects, designers, researchers and educators collaborate on the best way to handle the communication and translations of environment-behavior research (EBR).

While architects show a desire for behavioral research information and have a great interest in designing for people – showing an awareness of the potential impact of EBR on their work – they rarely use it. The research proposed here will investigate methods and strategies for bridging the design practitioner – researcher gap as well as identify preferred methods of EBR communication. This study, on the application gap, is a follow-up to a previous study by Fred Schmidt (1984) and includes relevant findings from studies by John Merrill (1973), Cynthia Karpan (2005), Joshua Oliver (2005), and the 2002 AIAS (American Institute of Architectural Students) Studio Culture Task Force.

Background and Need

In his 1984 study Schmidt found respondents (professional architects) clearly demonstrated a desire for EBR information. Schmidt went on to elaborate on the various means of communication methods preferred by respondents as well as the need to increase emphasis on behavioral factors in architectural schools and the need to make

2

EBR information more user-friendly. Schmidt stated his findings support those of Merrill (1973) and Seidel (1980).

The 2002 Report of the AIAS Studio Culture Task Force: *The Redesign of Studio Culture*, states the task force was charged to research the current practices in architectural education and target opportunities for positive change in studio culture. In the *A Call to Action* section the task force members clearly state ". . . a need for change in order for architecture to develop and reach its potential" (p. 25). AIAS's mission, as outlined in the task force report, is "to promote excellence in architectural education, training, and practice . . . and to organize students and combine their efforts to advance the art and science of architecture" (p. 1). Given the findings of Schmidt (1984), Merrill (1984), and Karpan (2005), a need to increase emphasis on behavioral factors in architectural schools is imperative.

These findings are supported by designers, educators and researchers such as Alexander (1964), Deasy (1973) and Seidel (1980). Christopher Alexander (1964) concludes "the quantity of specialized information of various sorts available to assist architects is now so large and so poorly organized that it is not surprising that designers have difficulty keeping up with it" (p.4). In the August 1973 issue of *Human Behavior* Deasy writes "I regard the concept of a behaviorist-designer team as a millennial breakthrough" (p. 15). Seidel (1980) concluded that "architectural education does not have a tradition of explicitly using the results of social research" and that "social research does not have a tradition of formulating itself in ways that would produce results useful to professional decision makers" (p. 12).

Rationale, Purpose and Research Question

The object of this study is to investigate methods and strategies for bridging the design practitioner - researcher gap. A disconnect between EBR and its use by the design profession is the larger problem being investigated. This study is a follow-up of a study completed in 1984 by Schmidt and incorporates findings from a study by Merrill (1973). While Schmidt built on the work of Merrill, the comparisons between the two studies are not based on identical survey item congruence. The same can be said of the current survey when compared to the 1984 survey.

The design professional, through responses to survey questions administered by Schmidt (1984), identified the top disconnects between design practitioners and environment-behavior research as being due to ". . . findings are presented in overly wordy and full of jargon" form, "clients do not understand the point of using behavior research", or "there should be more emphasis on behavioral factors during architectural / design education" (Schmidt, p. 106). Given the span of time between the previous studies – Merrill (1973) and Schmidt (1984) – while also considering the findings of Karpan (2005) and Oliver (2005), a study was undertaken to determine if the application gap still exists and, if so, what factors do respondents (professional architects) today believe are causing the disconnect and how should the application gap be addressed. The application gap was also written about by Hillier, et al. (1972) who stated ". . . there appears to be a serious application gap blocking the utilization of EBR in design" (p. 2).

By identifying what is causing the application gap, if anything, a recommendation on how to narrow this disconnect will be made by this researcher. The value and benefit

4

of EBR has been clearly identified by several researchers including Schmidt (1973), Merrill (1984), Seidel (1980), and confirmed by respondents in these studies leaving no doubt as to the importance of EBR to the design profession. For EBR to be effective, it must first be determined if the design practitioner still believes EBR to be important to the design process and to identify reasons for lack of use. The survey created for this study is a means to that end. The survey created for the current study mimics questions from the two previous studies so a more accurate comparison across studies can be made.

Methods and Limitations

Simply stated, participants (professional architects) were asked to respond to 82 questions in a survey about the uses architects and interior designers make of environment-behavior research and how such research can make the work of architects, interior designers, landscape architects, sociologists, psychologists and others who study how the characteristics of the physical environment affect human behavior and attitudes more relevant and effective. The use of an electronic survey sent as an email attachment was the method of data collection. The current survey was based on questions from Schmidt's (1984) survey, although not all items were identical in congruence. Several survey sections were designed to determine an architect's receptivity to EBR including propensity to use EBR and awareness of EBR, as well as to determine the method(s) of EBR communication most preferred by the practicing architect. Additional questions were asked to determine respondent demographics.

In keeping with Schmidt's 1984 study, the population surveyed was AIA members. Schmidt selected 400 participants covering 45 states selected from a printed

version of the AIA member profiles. Since AIA no longer produces a printed version of

their member profiles, a direct appeal was made to AIA for assistance with distribution of

the 2008 survey. The appeal netted 400 email addresses from similar demographics as

Schmidt's mailing. Survey results were entered in to an Excel spreadsheet and further

analyzed through SPSS.

Chapter Two

LITERATURE REVIEW

Environment-Behavior Research (EBR) as a relatively new field of study, along with journal articles, theses and dissertation topics that disseminate research results, has gained recognition over the last three to four decades. In 1968 the Environmental Design Research Association (EDRA) was established as the primary professional research conference for those interested in sharing and learning about environment-behavior research. To date, a number of studies have been conducted and results published, but very few of these results are embraced by practicing design professionals (Merrill, 1976; Seidel, 1980; Schmidt, 1984; Karpan, 2005; Oliver, 2005). While architects show a desire for behavioral research information and have a great interest in designing for people – showing an awareness of the potential impact of EBR on their work – the previous studies concluded that design professionals rarely use it. Additionally, several notable design professionals and EBR researchers have come to the same conclusion – design professionals rarely use EBR (Bechtel, 1997; Kaplans, 1982; Zeisel, 1975, 2006).

The research proposed here investigated methods and strategies for bridging the design practitioner-researcher gap. This research will focus on the uses architects and interior designers make of environment-behavior research (EBR) and how such research can make their work more responsive to their clients need(s). By behavior research it is meant the work of professional architects, interior designers, landscape architects, sociologists, psychologist and others who study how the characteristics of the physical environment affect human behavior and attitudes.

Schmidt (1984), in his master's thesis, refers to the *application gap* – the non-utilization of EBR findings by practicing architects; wherein he refers to an earlier examination of this gap by Merrill (1973), who identified two types of constraints that influences the use of EBR in design – *external* and *internal* constraints. External constraints are those factors outside the control of the architect that limit or prevent his use of EBR in design. Internal constraints are the more basic and yet more complex problems at the heart of the application gap. Lawson (1990) echoes Merrill's view on internal and external constraints as influences on the use of EBR in design.

The history of environment-behavior research is presented as an interdisciplinary movement - a field of research and practice that borrows ideas, methods, and personnel from many diverse areas. Despite the constant efforts of environment-behavior (EB) researchers and practitioners, very few design firms use social science as a part of their everyday practice. Bechtel (1997) believes EBR is still considered a frontier to be explored. Lawson (1990), as a designer and a psychologist, pointed out, ". . . the social sciences are primarily descriptive, while design is necessarily prescriptive, resulting in a mismatch between the strategies used by the two professions" (p. 67).

According to Merrill (1973), Schmidt (1984), Karpan (2005) and Oliver (2005), the progression of this topic – from identifying a need for EBR in design to acknowledging the need to make it user friendly – continues to be acknowledged by designers as an important factor in the design process. With the *flattening* (attributed to Friedman, 2005) of the world, architects will be charged with not only designing to meet the needs of clients, but more than likely, the needs of clients from different cultures.

8

Schmidt (1984) stated that architects will continue to design without EBR; noting researchers seem to be the party with the most to gain through translation efforts. This may no longer be true. Dickson & White (1993) tells us ". . . generating new knowledge to support the (design) profession should be a primary concern of both the practitioner and the design educator. This component constitutes the backbone of any profession and is what separates interior design from a trade school discipline" and the same can be said "of the architectural profession" (p. 4). It is imperative that architects, designers, researchers and educators collaborate on the best way to handle the communication and translations of EBR and begin to implement strategies towards this end. Societies are evolving into a global community by means of new and ever changing technology. If designers are to retain their competitive advantage in this community, the need to accommodate and change with this new technology is its first challenge.

Karpan (2005), in her recent unpublished dissertation, states the belief that the inability or lack of motivation for designers and/or researchers to translate basic research into applied knowledge prevents practitioners from being able to utilize research to form their decision making processes. She suggests the need to establish a third culture - beyond practitioner and researcher - that of knowledge management. A knowledge manager could mediate between the designer and research cultures. She further suggests design education at the bachelor's level, knowledge management education at the master's level and research education at the doctoral level.

Oliver (2005) notes,

> . . . just as there are consultants and experts for all types of business management
> situations, there are also consultants and experts for environmental issues. For
> over 40 years environment and behavior research has been combining social
> science theory with design to provide an entirely new perspective of our everyday
> environment. (p. iii)

Out of this research, the knowledge gained over the years from environment behavior research, has led to the identification and appreciation of procedures that address and deal with such issues as sick-building syndrome, the relationship between productivity and natural light, advancements in the design for the elderly, post-occupancy evaluation (POE), and countless other issues. Oliver believes it is through the collaboration between design professionals and environment behavior researchers - the sharing and exchange of knowledge - that users will be better served. "Architectural research allows us to understand, at least a little better, that successfully built environments are successful not just because of their physical attribute, but also because of many *human* considerations" (Groat & Wang, 2002, p. x). Zeisel (2006) ". . . designers who employ E-B research systematically and regularly help to contribute to a shared body of E-B knowledge" (p. 16). Meaning, designs and design decisions, once evaluated, will further augment EBR and its overall evolution and progress.

A Look Back

Sir Henry Wotton (1624), in *The Elements of Architecture* (one of only two published works) wrote of "Firmness, Commodity and Delight" (p. 1xxxvii). Wotton

stated that "In architecture as in all other operative arts, the end must direct the operation. The end is to build well. Well building hath three conditions, Commodity, Firmness and Delight" (p. 1xxxvii). *Commodity*, referring to the functional aspects of building, *Firmness*, referring to the technological concerns of building and, *Delight* representing the aesthetics that architects are expected to include in their design. Ideally, in their designs, architects provide a balance of all three dimensions of well building. However, in the literature, there is much to indicate that architects have allowed delight to overshadow commodity and firmness.

In 1896, the American architect Louis Henri Sullivan coined the phrase "form ever follows function" (p. 104) in his article *The Tall Office Building Artistically Considered*. For Sullivan this was distilled wisdom, an aesthetic credo, the single "rule that shall permit of no exception". The full quote is thus:

It is the pervading law of all things organic and inorganic,

Of all things physical and metaphysical,

Of all things human and all things super-human,

Of all true manifestations of the head,

Of the heart, of the soul,

That the life is recognizable in its expression,

That form ever follows function. This is the law. (p. 104)

Sullivan (1896) is credited with developing the shape of the steel skyscraper in late 19th century Chicago at a time when technology, taste and economic forces converged and made it necessary to drop the conventional styles of the past. Because the

shape of a building could not be chosen out of the old pattern book, something had to

determine form. According to Sullivan, it was going to be the purpose of the building. It

was "form ever follows function" (p. 104), as opposed to form follows precedent. Frank

Lloyd Wright, who began his career in the same architecture firm as Sullivan and later

became Sullivan's mentee and assistant, adopted and professed the same principle in a

slightly different form – that "Form and Function Are One" (para. 3).

This point of view was also established in the writings of Christopher Alexander

(1964). Alexander, in response to what he considered a lack of systematic and explicit

design theory, pointed out that the form of any object should evolve from the logical and

systematic examination of the problem setting. He illustrated that many architects address

complex design problems in a very unsystematic fashion, often trying to force the

solution into a form which was conceived independent of the problem setting.

Alexander's basic premise was that although ideally the form should reflect all the known

information relevant to its design, the intuitive resolution of all this input in a

contemporary design problem is beyond any individual's abilities. Alexander (1964) goes

on to convey the idea that the slow cultural evolution of form and the time testing of

solutions derived from the true nature of the problem had vanished and the master builder

is replaced by the architect, who is overwhelmed by the complexity of the problem.

Lawson (1990) put forward a similar position by asking how a few hours or a few

days of effort on the drawing board could replace the result of centuries of adaptation and

evolution. He supported Alexander's position and points out the shift in the goals of

architecture was inevitable given the sudden, rapid, and culturally irreversible changes

brought on by the industrial revolution. Lawson stated that ". . . the shift in values towards the individual designer as the keeper of the style has been firmly institutionalized in the architectural education system, giving rise to the cult of the individual" (p. 18).

Much information about the design setting and the users is bypassed in order to focus more effort on instilling "delight" (p. 1xxxvii). As a result, the many questions about users that arise during the design of a building are answered by simply making assumptions about their behavior, and proceeding from there. Alexander's *Notes on the Synthesis of Form* (1964) altered the way designers thought about the design process, yet the conventional way persisted – the design process excluded a behaviorally-based research component. Lawson (1990) poses, "However that generation of design methodology, for which Alexander's work now stands as a symbol, was motivated by the common unease shared by designers about the inadequacy of their models of reality" (p.19). Deasy (1974), as an architect and former chairman of the research committee of the AIA, describes criticisms of the profession as "coming thick and fast" (p. 9). Herbert Gans (1968) ". . . most architects don't have the foggiest notion how society works, how people live, and how they want to live" (as cited in *Design for Human Affairs*, Deasy, 1973, p. 8). In time, opinions such as Gans' led to introspection on the part of the architectural profession. The search for an alternate methodology was begun when complaints about the architect's design methods became undeniable.

> Recently there is evidence that the profession is growing uncomfortable with the art values with which it has been traditionally associated. It now wishes to be identified with the science of problem solving and seeks a methodological base

13

for the resolution of social and technological problems which relates to the

building and to the larger question of habitation. (McCue, 1970, p. 288).

In the words of Winston Churchill (1943), "We shape our buildings and

afterwards our buildings shape us" (We Shape Our Buildings section), received support

from the work of social psychologists such as Lewin (1936), Barker (1968,) and Lawton

(1973). Through the work of these psychologists, human behavior was shown not only to

be a function of the individual, and the environment, but of the interaction of the two.

Research, by these psychologists, demonstrated that the environment serves as a social

milieu composed of complex patterns of human behavior. What many architects had

intuitively sensed was now empirically established. The consensus of this body of

research of the interactive nature of man and his environment, the design of the physical

environment necessitates the involvement of man in any decision making process that has

a direct effect on his behavior.

Thus, according to Schmidt (1984), a basic dialectic was established between the

aesthetic-based, intuitive method of design and the systematic, behavior-based method of

design. Proponents of the behavior-based methodology, inspired by Lewin (1936), Barker

(1968) and Lawton (1973), prepared a challenge to the architectural profession's status

quo, as shown by McCue's (1970) comments:

> It is the dependence upon personal judgment that is both the strength and
>
> weakness of the profession. The architect's strength lies in the fact that he must
>
> define his own problem and establish the factors against which he weighs
>
> alternative solutions; at the same time this characteristic forms his weakness,

14

because his reliance on personal decision making often causes him to function on an ad hoc basis, frequently not recording or systematically evaluating his work and disregarding more procedural analytical techniques operative in other fields but which may have applicability to the field of architecture. (p. 279)

In 2002, the AIAS published a report of the AIAS Studio Culture Task Force titled: *The Redesign of Studio Culture*. AIAS is an independent, nonprofit, student-run organization with over 6,000 architecture and design student members in 125 colleges and universities across North America. Charged with researching the current practices in architectural education and to target opportunities for positive change in studio culture, AIAS initiated the Studio Culture Task Force in December of 2000. The primary goal of the task force was to generate discourse about studio culture within all architecture schools and the discipline of architecture to gain a diverse amount of feedback and research a wide range of ideas on architectural education. Members of the task force included: Aaron Koch, 2001-2002 AIAS National Vice President, 2001 BS in architecture, University of Minnesota, Twin Cities; Katherine Schwennsen, FAIA (Fellow of the American Institute of Architecture), AIA representative, architect and educator at Iowa State University, BA and MArch from Iowa State; Thomas A. Dutton, ACSA (Association of Collegiate Schools of Architecture) representative, architect and professor of architecture and interior design at Miami University in Oxford, Ohio, BArch from Cal Poly San Luis Obispo, California, Masters in Architecture and Urban Design from Washington University, Saint Louis, Missouri; Deanna Smith, AIAS member, student at Drury University in Springfield, Missouri, served on the AIAS National Board

of Directors as the National Director of the Midwest Quadrant, and also served as the AIAS President at Drury University.

AIAS contacted students, architects, educators, leaders of the architectural collateral organizations - such as *ArchVoices* and *Architectural Record* - members of the building and construction industry, psychologist, sociologists, and experts on higher education through a direct mailing campaign and through calls for feedback published by *ArchVoices* and *Architectural Record*. Additionally, leaders of the collateral organizations - such as ACSA (Association of Collegiate Schools of Architecture) and AIA (American Institute of Architecture) - discussed studio culture in a special Five Presidents Panel Discussion and at several of their meetings. The task force members defined *studio culture* as "the experiences, habits, and patterns found within the architecture design studio" (*AIAS Report*, 2002, p. 3).

The AIAS "answered the call for rationality in design" (p. 10) as noted in their 2002 task force report stating, "commodity and firmness are of equal importance to delight" (p. 10), and called for a more broad definition of design as well as the need for redesign of the studio culture found in most higher education settings. This call for a more rational and systematic design process required an increased emphasis on human factors in the design process. Many designers felt the esthetic goals of modern architecture were met at the expense of human comfort by the building users. The proponents of design for human factors found support for their argument in the field of ecological psychology.

One becomes more acutely aware of the need to incorporate environmental based research in the design profession after reading Friedman's book *The World is Flat* (2006). Although not peer reviewed, Friedman comments about the needs of design clients echo those of the AIAS Report (2002).

> With the 'flattening' or globalization of the world, architects will be
>
> charged with not only designing to meet the needs of clients but on a
>
> greater 'value added' platform.
>
> More business will be conducted through collaborations within
>
> and between companies, for a very simple reason: The next layers of
>
> value creation are becoming so complex that no single firm is going to
>
> be able to master them alone. (Friedman, 2006, p. 457)

In AIAS's 2002 report: *The Redesign of Studio Culture*, a statement similar to Friedman's (2005) is made, ". . . the world is becoming more complex, boundaries are eroding, information is flowing faster, and globalization is a part of our everyday vocabulary. This directly affects studio culture" (p. 4).

Architecture as a profession has allowed its purposes and methods to become so ambiguous that many of its own members are bewildered when asked about the direction of the field. This state of affairs was boldly described by McCue (1970),

> No other viable profession has such a poor history of scholarship and research,
>
> nor depends so totally upon other fields for the advancement of knowledge of its
>
> specialty. Few other fields are so inadequate in recording and transmitting the
>
> knowledge developed through its practice. (p. 294)

McCue seems to be saying, that the way we teach is set up to produce *followers* (those

who replicate) rather than *leaders* (those who can solve problems). The 2002 AIAS

Report reveals a similar thought, ". . . architectural education must depend less on skill-

based learning and more on the dissemination of knowledge" (p. 13). In support of this

statement, Lawson (1990) notes ". . . design is as much a matter of finding problems as it

is of solving them" (p. 87).

Search for a New Paradigm for Design

Earlier, the search for a new paradigm for design led to the examination of the

scientific community. Lawson (1990) tells us,

> Somehow the whole process had to become more open to inspection and critical
>
> evaluation. The model of the scientific method proved to be irresistible. Scientists
>
> made explicit not just their results but also their procedures. Their work could be
>
> replicated and criticized and their methods were above suspicion. (p. 19)

In addition to the methodological rigor and clarity of the scientific paradigm, science also

provided access to bodies of information that the architect needed to design successfully

in a rapidly changing society.

> When the client is not the prospective user of the design, the problem
>
> becomes even more remote. This increasing remoteness of designers from those
>
> for whom they design has created the need for user-requirement studies. Almost
>
> in desperation designers have turned to social and human scientists from

ergonomists through architectural psychologist to urban sociologists to tell them

what their users actually need. (Lawson, 1990, p. 67)

And Gutman (1972),

The interest in joining the resources of the social and design disciplines arises

from several sources. Probably the major factor in this process is the realization

by the design professions that the intellectual traditions of architecture and

planning are simply not adequate for grasping the complexity of the building

needs of urbanized and industrialized societies. Architects find themselves facing

tasks and clients for which their training did not prepare them. (p. xi)

Alexander's *Notes on the Synthesis of Form* (1964), used as a benchmark, in the

nearly twenty years since then has seen the emergence of a new area of study which

focuses on the interaction of the physical environment and human behavior. This field is

referred to as environment-behavior research (EBR). The field includes basic research

from the fields of sociology, psychology, and other social sciences, and also includes

architectural applications of research such as post-occupancy evaluation (POE) and

behavior-based methods of design programming.

As described by Merrill (1976), the growth of interest in this area was rapid. A

collection of research dealing with the behavioral aspects of school design, titled *School-

Environment Research* (SER 1), was published in 1965. The scope of this publication

was expanded beyond school design in 1970, resulting in another catalogue of EBR

papers, *Man-Environment Research* (MER). About the same time a newsletter, *Man-*

Environment Systems and a journal, *Environment and Behavior* began publication

(Merrill, p. 15).

In support of EBR, it should be noted, graduate studies programs were developed

that dealt specifically with the environment-behavior interface. Findings from Karpan's

2005 study suggest the same - graduate professional programs should focus on research.

Karpan goes on to state "By its very nature, design is a creative endeavor that tends to be

subjective in nature. Research is almost the exact opposite in that it tends to be objective

in nature" (p. 175). For the most part, designers are educated, trained, and indoctrinated

differently than researchers. In other words, design and research represent two different

cultures, and are two different activities where it would be difficult to merge into one

because each one uses unique processes to generate unique products intended to serve

unique audiences.

Karpan's findings are consistent with those of Dickson & White's (1993) wherein

they found that educators and practitioners "speak different languages" (p. 3). Seidel

(1980) reinforces support of EBR by saying ". . . when the commitment to the EBR

approach and administrative and faculty support are present, it is clear that EBR can be

highly useful to improve the architectural studio education and architectural design" (p.

12).

It is hard to imagine more eligible candidates for collaboration than

architects and social science. Social science, well versed on people's

needs, seems a natural help-mate in architecture's quest to improve

the quality of messages that buildings communicate to people.

(Korobkin, 1975, p. 2).

In 1968, the Environmental Design Research Association (EDRA) was formed

providing a network of professionals and a forum for the exchange of ideas related to

EBR. Another milestone was the creation of a task force on Environment and Behavior in

1973 by the American Psychological Association (APA). The American Institute of

Architects (AIA) also became involved by sponsoring conferences and research dealing

specifically with the interaction of architecture and the social sciences. However, there

continues to be an on going struggle about the value and use of EBR as can be noted by

Lawson (1990), who states, "Conferences about design research are rarely attended by

those who are recognized as the leading designers of the day, and many practicing

designers have little respect for some design researchers" (p. 225).

In the fall of 2005, the NAAB (National Architecture Accrediting Board) issued

an additional condition for accreditation of schools of architecture: Studio Culture. Each

accredited School of Architecture is now required to have a written policy addressing and

shaping its studio culture. Several years before that, as noted earlier, the AIAS Task

Force (2002) addressed that issue - both the positive and negative aspects of studio

culture. In that report the writers called for explicit policies to support the positive aspects

of studio culture, while curbing some of the more unhealthy practices. The positive

values identified by the report include optimism, respect, sharing, engagement, and innovation (p. 3).

The 2002 AIAS Report stated ". . . design studio lies at the core of design education" (p. 3). In fact, as the report goes on to say, ". . . studio courses command the most credit hours, the largest workloads, the most intensive time commitment from educators and students, and are of supreme importance. Studio courses are intended as the point of integration for all other coursework and educational experiences" (p. 3). Supporting this idea of design studio as a means of integrating all other coursework and the educational experiences, Boyer & Mitgang (1996) devote a section in their special report titled *A More Integrated Curriculum* where they state, "Making the connections, both *within* the architecture curriculum and *between* architecture and other disciplines on campus, is, we believe, the single most important challenge confronting architectural programs" (p. 85). Design is a skill that, for most professionals, must be acquired and developed. Supporting the goals of design studio, Lawson (1990) states, ". . . design is as much a matter of finding problems as it is of solving them" (p.87). Ideally, design studio teaches critical thinking and creates an environment where students are taught to question all things in order to create better designs.

In this spirit, the AIAS Report (2002) offered a critique on the current practices in design studio education. Members of the task force - Aaron Koch, Katherine Schwennsen, Thomas A. Dutton, and Deanna Smith - attempted to frame their examination of current studio practices much like a design problem by applying the basic criteria used by designers: research, examine, critique, determine roles, and design. The

first part of the report explores the current state of studio education, then examines outside forces impacting architecture education, and finally calls for change in studio culture. The task force members concluded that the use of design studios is an excellent educational model, and cited a number of scholars who have documented this belief (Schön, 1983; Boyer & Mitgang, 1996), stating, ". . . at its best, studio learning has many strengths" (p. 4).

The studio model has its own culture and values that are as influential in a student's education as the actual projects they complete. In many cases, the habits and patterns exhibited in this culture are not the intentional product, but a byproduct. These byproducts can be very positive, but they can also produce harmful results. Scholars, like Dutton (1991) and Anthony (1993), have called the consequences of this culture the "hidden curriculum of studio learning" (*AIAS Report*, 2002, p. 4). The hidden curriculum refers to those unstated values, attitudes, and norms that stem from the social relations of the school and classroom as well as the content of the course. "Habits and culture are passed on throughout the years, and patterns are built upon generations of students, educators, and practitioners" (*AIAS Report*, 2002, p. 4).

Fisher (2000) notes, that throughout the 20th century, ". . . design studio culture has largely remained the same. In fact, one of the roles of a culture is resistance to change" (p. 68). And, at the very least, the changes that have occurred do not begin to keep pace with the changing nature of the world or the changing context of architecture practice. The 2002 AIAS report noted that there are more changes than could be published in a report, and, followed that up by adding, ". . . the world is becoming more

complex, boundaries are eroding, information is flowing faster, and globalization is a part

of our everyday vocabulary. This directly affects studio culture"

(p. 4).

More specifically,

. . . design practice is undergoing large transformations. New technologies

impact the way spaces are designed, construction documents are produced,

and even the methods of building fabrication. Clients are demanding, and

designers are delivering, an expanding set of services. Change must occur

to proactively address the changes in the world and practice. Change must

happen to elevate the value of architectural education. Change must occur

to proactively address the changes in the world and practice.

(*AIAS Report*, 2002, p. 4)

The AIAS report (2002) goes on to state that, design must be defined more broadly.

"If, commodity and firmness are of equal importance to delight, then the ability to

view design as a process serves a designer for a lifetime and withstands changes

in styles, materials, construction methods, and technology" (p. 10). These design-

thinking skills allow designers to build on their knowledge base and apply their

abilities to an infinite number of applications. "These principles are the

foundation of a sustainable design ethic; sustainable in both the products it creates

and the processes used to create them" (p. 11).

Dickinson and White (1992), in their journal article *Are We Speaking the Same Language?,* note that a primary concern of both the practitioner and the design educator should be the issue of generating new knowledge to support the profession. They also say, "This component (generating new knowledge to support the profession) constitutes the backbone of any profession and is what separates interior design from a trade school discipline" (p.4). Although speaking specifically about the interior design profession, they go on to say that the architectural profession would benefit from this same issue. This idea is reinforced by Fisher (2000),

> Most of us were taught in school to think of ourselves as individualists and
> even encouraged to be iconoclasts. One result of that individualism is that
> it has accustomed us to think of ourselves as competitors, something more
> characteristic of a trade than a profession. (p. 30)

The task force members concluded that "architecture is a social art, involving countless voices and agendas. Its success is dependent on the application of knowledge from multiple disciplines and perspectives" (*AIAS Report*, 2002, p. 12). This is well known, just as it is known and agreed upon by most designers, that the most complex of contemporary issues can only be addressed through collaborative efforts. Design education must depend less on skill-based learning and more on the dissemination of knowledge. Education needs to offer students "a broader base of ideas from which to draw, different ways of knowing, different methods of research and analysis, and different approaches and attitudes" (*AIAS Report*, 2002, p. 13).

The following statements, gleaned from the web sites of schools of architecture from several major universities around the country, show the impact of AIAS's Studio Task Force Report: *The Redesign of Studio Culture* (2002).

UT-Austin

In the fall of 2005, the NAAB issued an additional condition for accreditation: Studio Culture. Each accredited School of Architecture is now required to have a written policy addressing and shaping its studio culture. Several years ago, the American Institute of Architecture Students (AIAS) created a task force to address both the positive and negative aspects of studio culture and issued its report in 2002. In that report the writers call for explicit policies to support the positive aspects of studio culture, while curbing some of the more unhealthy practices. The positive values identified by the Report include optimism, respect, sharing, engagement, and innovation.

Studio culture affirms the value of design intention, design process, as well as design "product" and affirms three principal values — respect for a student's ideas (grasp), the development of these ideas (process), and the ability to make ideas spatial and material (product).

Studio culture encourages students to embrace studio-based learning as a unique and valuable educational model. Studio creates an environment which allows open-ended questions, for which there may be no "right" answers. (Studio Culture, Background section, para. 1, 2008)

University of Oregon

> The Department of Architecture at the University of Oregon seeks to provide a well-rounded education . . . We seek to develop not only future introspective practitioners, but also critical thinkers who will eventually be in significant leadership positions in the profession. To achieve this goal, the department's programs focus on providing a comprehensive and holistic approach to learning. The architecture studio is the primary venue where the synthesis of ideas takes place. (About section, para. 2, 2008)

Rice University

> To further open Rice to the world and to allow students and faculty some geographical flexibility in pursuing their work, the School provides limited opportunities for study abroad. Studios are no longer simply housed in Anderson Hall, but are assisted both actually and virtually by travel and exposure to the world beyond. (School of Architecture, para. 3, 2008))

American Institute of Architecture (AIA)

Published in the December 2002 issue of AIA Journal, was the mission statement and supporting covenant as passed by the membership at their September meeting. AIA's mission statement: "The American Institute of Architects is the voice of the architecture profession and the resource for its members in service to society"

(American Institute of Architecture Mission Statement and Covenants sidebar, AIA.org).

Paul W. Welch Jr., Hon. AIA, executive vice president, AIA California Council, and

chair of the Component Partnerships Committee, which developed and authored the covenant, noted that the covenant "resolves how and in what ways the AIA can be a resource for its members" (p. 1, para. 2, 2008).

The covenant is divided into two sections. The first is *The Commitment of the AIA*, which, through its seven points, outlines how the members of the AIA create a community to share knowledge and advocate a shared vision in order to have a positive impact on the direction of the profession, the shape of our neighborhoods, and on the world. The goals relate to governance, standards of professionalism and integrity, advancement of public policies, knowledge sharing, fellowship, and inclusiveness. The second section, *The Contribution of Members*, has seven bullet points which refer to the way AIA members can realize the most value from their membership and how members can contribute to the success of the organization. In part, that includes, "taking time to become informed about AIA services and programs" and "responding as a citizen and architect to community needs" (p. 1, para. 3, 2008).

Welch points out, the *Member Covenant* ". . . looks at the organization from 30,000 feet to assess what the AIA aspires to be. As we get closer to the ground, we begin to clarify roles". (p. 2, para. 2, 2008).

For purposes of this study, only four of fourteen covenant bullet points are referenced. The first three are from the first section, *The Commitment of the AIA*, and the fourth is from the second section, *The Contribution of Members*.

The AIA is dedicated to the highest standards of professionalism, integrity, and competence as embodied in the AIA's Code of Ethics and Professional Conduct.

The AIA represents the highest values of the profession in establishing

public policies and advancing positions.

The AIA offers opportunities for members to become more

knowledgeable as professionals, increasing their value to clients and society.

Contributing to the advancement of knowledge in the profession.

With every project, architects create innovative solutions that can inspire others

and advance the profession when shared through documentation and education.

(p. 2, para. 2, 2008)

Since 1956, the American Institute of Architecture Students (AIAS) has been the

official voice of students to the educational system and the profession of architecture and

design. The association helps to build interest and enrich the educational experience of

students (of all ages) and others in architecture and design. In 2008, the AIA created

Soloso, an online resource for members, to bring the most current architecture

information directly to their member's desktop including research, knowledge,

community resources, e-journals, award-winning projects, image banks, third-party site

links and more. Their web site states, "Soloso fosters and facilitates the sharing of

knowledge, exchange of ideas and collaboration among architects like never before and is

billed as the premier knowledge resource custom-built for architects" (para. 1, 2008).

EBR Educators

Kaplan & Kaplan's *Humanscape: Environments for People* (1982), used by some

in the education of design students, is an introduction to a more holistic way of thinking.

It was written to provide both structure for understanding and guidance for practical problems.

The Kaplans (1982) tell us that, in the area of human environment relations as a whole there is a noticeable lack of concern with the issue of human needs. One might think that what humans care about, what their psychological needs are, would be central to this growing area of study. "Yet probably no topic is so systematically ignored" (p. 83).

It can be said that much is known about humans and their behavior, but often this knowledge has been of limited help to those working to improve the human condition. Sometimes the problem has been the narrowness of viewpoint and, at other times, the tendency to measure only what is easily measured has led to decisions that were easier to make than to live with. "Other potential applications have been ruled out because they are 'too expensive', but only because implementation is assumed to be something carried out by high-priced experts rather than ordinary people" (p. xiii).

Cantril's *The Human Design* (1966) was written in the context of a multinational survey of people's satisfactions and concerns. "Most people in the world today were found to be still concerned with living a type of life that constitutes well-being on a relatively simple level with what amenities their cultures can provide" (p. 95). Farber (1966) tells us, ". . . social planning is indispensable in a crowded world, but if our society is to remain viable, our planning must recognize our nonmaterial needs more than it has; and it must offer us worthwhile goals without exalting one at the expense of others" (p. 109). There is some reason to believe that the decision to ignore human needs

30

is exceedingly costly. "Back when things 'just growed', . . . the culture guided the design and structuring of space in ways that had satisfied a wide range of human needs at least reasonably well over the years" (Cantril, 1966, p. 83).

Kaplan & Kaplan (1982), tell us that the concept of "Rational, or Economic Man . . . assumes that decisions are made by considering all the alternatives and seeking a solution that will lead to the greatest gain" (p. 121). To add to this, "Environments are changing at a dizzying pace" (p. 340). People with distinctly different understandings about the world and different conventional guides to behavior are thrown together in the same community. "Further, problems of rapidly increasing size have often led to rationalized, explicit (and often ad hoc) means of handling problems that were once dealt with in an intuitive, integrated, relatively coherent system of beliefs and directives for behavior" (p. 341).

Humans have persisted now over a period of thousands, perhaps even millions of years. Through the exercise of choice and control, and through the creation and handing down of cognitive interpretations, humans have made their way. They participated in their physical and social environments, and, at least to some degree, in the structuring of their futures. But this relatively impressive record offers little comfort for our own times. The world has changed and problems mount with incredible speed.

For various reasons, many – perhaps most – humans participate minimally in the world about them. A gap between humans as skillful problem solvers and the problems that threaten us has developed. In other words, ". . . the participatory relationship, in which the various means of coping are brought together, may need to be restored"

31

(Kaplan & Kaplan, 1982, p. 403). Two areas of misconceptions seem to be major obstacles to effective use of participation. "One is the notion that participation means that the design process is to be left to the untrained (and) . . . the other involves a lowly view of the 'common folk', a notion that most people are really not up to the challenge of effective participation. . . . the consequence is a fear of 'design by the least competent'" (R. Kaplan, 1977, p. 437). Put another way, Lewis (1975) states, "Communication, the transfer of information from one head to another, can be exceedingly frustrating and difficult, especially if there is a shortage of shared cognitive maps" (p. 448). And the Kaplans (1982) suggest, "A new conception and a new role for experts is needed that emphasizes sharing, facilitating, and 'working with' rather than 'doing to'" (p. 456).

Zeisel (2006) shares the Kaplan's conclusion that people from different disciplines work together because they want to, not because they must. We know when researchers and designers cooperate, each uses the other to do more than either can do alone - researchers to have designers use and improve their information and designers to have EB researchers help narrow the gap between them and their client. The practical side to multidisciplinary professional cooperation is that designers make decisions about real environments for real clients and EB researchers have real environment problems that will be applied to real people to solve. Occasions for cooperation in design include (1) programming research, in which investigators work with and study representative groups of potential users to arrive at a behavioral program; (2) design review during the design process, when researchers and designers test and modify ideas in the light of available EB knowledge; and (3) post occupancy evaluation (POE) research of built

32

projects in use where findings can be used to improve future designs and design

processes. Cooperation enables people who work together to achieve more than the sum

of each working separately. Even when people are through working together to solve

shared problems, something remains – knowledge of the other's discipline and point of

view - new ways to define problems and improved knowledge of how to cooperate with

others.

Call for Increased Rationality in Design

As stated earlier by Merrill (1973) and Schmidt (1984) in their dissertation and

thesis respectfully, as well as by the APA Task Force of 1973 and within AIA

conferences and research specifically dealing with the interaction of architecture and the

social sciences, given the context of the call for increased rationality in design and given

the rapid development of the field of EBR, one might logically assume that architects

would eagerly seek out EBR information pertinent to their design problems. This would

seem likely since it has been shown repeatedly that architects are both aware and

concerned about the behavioral implications of their work. A study of architectural belief

systems by Lipman (1969) showed that architects believe strongly that their work affects

social relations. In addition, Gutman (1972) points out ". . . no architect can talk about his

medium or his schemes without reference to how they will be used by people" (p. 340).

Further, Deasy (1973) states, "one of the fondest hopes of architects and planners is that

the practice of their act will lead to a better life for mankind" (p. 8).

In 1970 the Royal Institute of British Architects (RIBA) Research Committee

published results of a study on *Strategies for Architectural Research* noting ". . . EBR use

may be the lack or limited existence of a formal research tradition in the architectural profession" (p. 4). Nickerson (2003) has a different perspective on the lack of interaction between designers and EB researchers. In his book *Psychology and Environmental Change,* Nickerson begins the preface with,

> The writing of this book was motivated by the belief that
> psychology has much to contribute to solving the problem of
> detrimental environmental change but that what the field has
> to offer has been realized only to a small degree to date . . . much
> more could be done if the problem were higher on the priority list
> for the psychological research community as a whole. (p. xi)

Simply stated, architects and designers must change their way of thinking in order to serve their clients better.

Defining the Application Gap / Baseline Studies' Finding's

To date, it has been found that not all architects will be equally receptive to the use of EBR information in design, nor do they share the same preferences for communication methods. Previous studies by Schmidt (1984), Merrill (1973) and others (such as Karpan, 2005 & Oliver, 2005) have indicated that architects are receptive to EBR information. Schmidt (1984) refers to the "application gap – the non-utilization of EBR findings by practicing architects" (p. ii). Schmidt gathered descriptive data concerning architects and their attitudes toward the use of EBR in design and identified the methods of EBR communication most preferred by practicing architects. From the

data collected, he concluded that the respondents in his study, generally speaking, were not very aware of EBR. Schmidt cited several examples of inconsistencies in recognition of EBR related items; such as,

> . . . if the architect was as familiar with the AIA Research Corporation as they indicated on the survey, how is it that the Coolfont Model scored the lowest of all items since it is a product of the AIA Research Corporation. (Schmidt, 1984, p. 77)

Schmidt questioned these inconsistencies by querying the respondent's actual knowledge of each item. He posed the idea that responses were made because the respondent recognized and responded to items of high visibility; such as AIA, versus having actual knowledge of a given EBR item.

Merrill (1973) documented the existence of an application gap separating EBR from use in design practice. In an earlier examination of this gap, he identified two types of constraints that influenced the use of EBR in design – external and internal constraints. He defined external constraints are those factors outside the control of the architect that limit or prevent his use of EBR in design. These include possible difficulty obtaining the information, translating, or applying the information. Internal constraints were stated as being the more basic and yet more complex problems at the heart of the application gap. Merrill determined that EBR was not being used because the research that was available did not match designer's needs or, was not part of the designer's knowledge base or, because the designer did not have adequate information on what these requirements are. Merrill notes that, unlike in the past when an architect usually designed for an individual

35

client, now more design work is generally on a much larger scale, and in many cases, the client is not the user. In his study, Merrill poses the question, how receptive are designers to information on behavior? He then goes on to state, "designers recognize a responsibility to create buildings that function for users but may have a limited concept of what this responsibility entails" (p. 9). If this is true, then designers may not see the relevance of EBR to their work.

Karpan (2005), acknowledges the need to make EBR in design user friendly, and suggests the establishment of a third culture (beyond practitioner and researcher) – that of knowledge management. Karpan states the belief that the inability or lack of motivation for designers and/or researchers to translate basic research into applied knowledge prevents practitioners from being able to utilize research to form their decision making processes. Karpan contends a knowledge manager could mediate between the designer and research cultures. She suggests design education at the bachelor's level, knowledge management education at the master's level and research education at the doctoral level - - with the opportunity of additional design and knowledge management education at higher levels.

Oliver (2005), in his thesis, notes that for over 40 years environment-behavior research has been combining social science theory with design to provide an entirely new perspective of our everyday environment. And that, from this research, the knowledge gained over the years has led to the identification of, and put in to place procedures, that address and deal with such issues as sick-building syndrome, the relationship between productivity and natural light, advancements in the design for the elderly, P.O.E.s, and

countless other issues. Oliver believes, "it is through the sharing and exchange of knowledge by researchers and designers that users will be better served" (p. 31).

In Summary

From the 1984 baseline study (Schmidt), a self-administered questionnaire was mailed to 400 AIA members randomly selected from a list of 40,000 names taken from the 1982 edition of AIA Profiles. This was approximately 1% of the membership. These individuals were located in 45 of the 50 states including Washington D.C. and Puerto Rico. Of the 188 surveys returned, 167 were considered "useable". Responses were from 41 of the 45 states plus Washington D.C. The first survey questions explored respondent's knowledge of ideas, books, organizations and people that are associated in some way with the field of environment-behavior research (EBR). Subsequent questions addressed receptivity, awareness, preferred methods of communication, propensity to use EBR, and respondent demographics.

After attempting to obtain responses through a loosely structured interview, the researcher in the 1973 baseline study (Merrill) determined a structured, self-administered questionnaire would net more meaningful responses. To insure a high return rate, this survey was mailed to 283 respondents taken from two populations – alumni from the Department of Architecture at the University of Michigan, and architects who had been involved with an Architecture and Government Project of the Gerontological Society. The objective of the survey was to identify issues affecting the EBR application gap. Questions were written to determine respondent's attitude towards EBR, what role they

felt EBR played in design, the usefulness of EBR, and the demographics of the respondent.

The research proposed here investigates methods and strategies for bridging the design practitioner - researcher gap. As stated earlier, while architects show a desire for behavioral research information and have a great interest in designing for people, they rarely use EBR. The many questions about users that arise during the design of a building are answered by assuming that what was discovered and used in decision making on a previous similar project is good enough for use on the current project; if it adequately addresses some of the issues, it is good enough. Some architects design for delight plus firmness with little thought given to commodity because they lack the time and/or the ability to conduct research and/or the ability to interpret existing research - delight, because they look at architecture as a fine art; firmness, because they are bound by local, state and national building codes; but not commodity because it's too much work (takes too much time and time is money) to find the research or do the research (maybe they are ill equipped to do the research) that would ultimately result in well building.

The survey queried architects on the uses they make of environment-behavior research (EBR) and how such research can make their work more relevant per their clients need(s). The researchers in the two previous baseline studies – Merrill (1973) and Schmidt (1984) - state that architects acknowledge a need for EBR but feel there exists a disconnect between the architect and the researcher, or that the availability of EBR or the ability to interpret and/or apply EBR findings to their project(s) is an issue.

38

Chapter Three

METHODS

This study is a follow-up to and continuation of a study completed in 1984 by

Schmidt and incorporates findings from a doctoral dissertation completed in 1973 by

Merrill. The object of this study is to investigate methods and strategies for bridging the

design practitioner - researcher gap and compare findings to those from the 1984 study

and include relevant outcomes from the 1973 study when applicable. Design practitioner

includes professional architects and interior designers. While Schmidt (1984) built on the

work of Merrill (1973), the comparisons between the two studies are not based on

identical survey item congruence. As a result, this research focus is on a closer

examination of Schmidt's work (the more recent research) with reference to Merrill's

work where relevant.

Data Collection

Because AIA no longer produces a printed version of their member profiles,

which was available to Schmidt as a non-member in 1984, a direct appeal was made to

AIA for assistance with distribution of the survey. After several months of email

exchanges with various AIA administrators, a list of AIA members email addresses,

comparable to the demographics of the 1984 study respondents, were obtained. Because

only email addresses were provided, it was not always possible to determine the state

from which each response was received. However, some responses contained a location

in the signature line in the body of the respondent's reply email. Responses were noted

from California, Texas, Florida, Missouri and several states on the east coast reducing the likelihood of a regional bias.

Data Management

The response field in the current survey was designed to mimic the 1984 questionnaire (see Appendix B). This design facilitated the comparison of data collected as well as insured the researcher was measuring like data. Results were entered in to an Excel spreadsheet then checked for accuracy of transition of data from the original surveys to the spreadsheet. Once the accuracy of data transition was confirmed, it was transformed in to statistically significant sets, analyzed, and compared to like data sets from the 1984 study, and in some cases, the 1973 study. The current study used both the SPSS program and Microsoft Office Excel 2007 for data sorting and analysis.

Response Rate

Four hundred surveys were emailed in late September 2008 to the selected members of the American Institute of Architecture (AIA). The first responses came back three days later with the last response received in late October, 2008. Of the 400 surveys emailed, 60 were returned, yielding 59 useable surveys for an overall response rate of 15 percent; a sample size sufficient for analysis. It was decided not to include responses from the 60th survey because the respondent only completed the first survey item.

From the first emails sent, five automated System Administrator replies were received stating *Undeliverable: Delivery Status Notifications*. Those were forwarded to AIA who replaced those five email addresses with new email addresses from the same

area as the returned email addresses. The survey and cover letter were then emailed to the new addresses the same day.

In addition to the five *Undeliverable: Delivery Status Notifications* received, there were five *Out of Office* replies, two *On Vacation* replies, 18 *Communication Problem* replies, seven *Email Does Not Exist* replies, and three *Full Mailbox* notifications. The survey and cover letter were re-emailed to all but the *Email Does Not Exist* addresses one week later. The initial email asked respondents to reply by October 6, 2008. A follow-up email was sent on October 9 to all respondents who had not returned their survey, stating the deadline had been extended to October 20.

Most surveys were returned with no comment. However, several were received with comments ranging from, "You have chosen an interesting, often overlooked, but very much needed aspect of our design profession.", to "I would like to receive an update of the results of your survey for my personal consideration of my positions (responses) in contrast to my colleagues.", and "I regret that I will not be able to fulfill your survey. I am currently a candidate for a State House of Representatives and as I am certain you can understand, have very limited time." Additionally, the AIA main point of contact issued an invitation to contribute an article on the outcome of the study to Soloso. Soloso is AIA's online knowledge resource launched in 2007.

Survey Design

Several of the survey sections were designed to determine an architect's propensity to use EBR as well as to determine the methods of EBR communication most preferred by the practicing architect and to determine why the architect does not use EBR

in the design process. Additionally respondents were asked a serious of questions to

identify respondent demographics to be compared with the demographics of respondents

from the 1973 and 1984 baseline studies. Taking precedent from those studies, it was

decided a self-administered email survey was the most appropriate method of gathering

data versus in-depth interviews or printed survey's mailed via the U.S. Postal Service.

EBR Receptivity

Some empirical data exists on the application gap and the attitudes that cause it.

This has resulted in members of the EBR community questioning architect and designer's

attitudes towards EBR. Such as, *Do you see a need for EBR?, Would you hire an EBR*

consultant or make them part of your staff?, *Do you find EBR research findings easy to*

use?

A list of 82 questions, written to cover the above queries, was compiled. Most of

these questions were drawn from the 1984 and 1973 studies. The content of the questions,

for the most part, fell into one of the following three categories: 1) *How much do you*

know about EBR?, 2) *Do you think EBR is useful for design?,* and 3) *Would you use EBR*

in design? (See Appendix A, p. 103).

The three areas were included in the measure of the architects' receptivity toward

EBR and were named **awareness** (*Do you know of EBR?),* **communication** (*What is your*

preferred method of EBR communication?), and **propensity** (*What are your attitudes for*

or against using EBR in design?). Questions for each area were specially developed and

then combined to form a composite, or index or receptivity, measure of attitudes toward

the use of EBR in design.

EBR Awareness

As the first component of the index of receptivity, a set of questions was developed to measure architects' awareness of the field of EBR –*Do you know of EBR?* To measure EBR awareness, a list of items associated in some way with the field of EBR was generated. Concise and clearly worded questions, mostly taken from Merrill and Schmidt's studies, were used in order to encourage responses to the survey that could accurately be compared to Merrill's (1973) and Schmidt's (1984) results. Respondents were asked to rate their familiarity with each item on a 5-point Likert scale. EBR leading figures – including architects, researchers and authors – along with books, associations and ideas linked to the EBR field were used to create a list of 26 awareness items, (Table 3.1.).

Table 3.1.

EBR Awareness Items

Variable	Item
V1a.	EDRA
V1b.	*A Pattern Language*
V1c.	behavior based design programing
V1d.	CM Deasy
V1e.	barrier free design
V1f.	Kevin Lynch
V1g.	behavior based post occupancy evaluations
V1h.	John Zeisel
V1i.	design for the elderly
V1j.	AIA Research Corporation
V1k.	Leon Pastalan
V1l.	architectural legibility & wayfinding
V1m.	*The World is Flat*
V1n.	Christopher Alexander
V1o.	behavioral issues in school design
V1p.	Caudill Rowlett Scott
V1q.	*Progressive Architecture* research awards
V1r.	Edward Hall
V1s.	behavioral issues in public housing design
V1t.	Clare Cooper Marcus
V1u.	behavioral issues in health care design
V1v.	Ezra Eherencrantz
V1w.	*Personal Space*
V1x.	Henry Sanoff
V1y.	Coolfont Model
V1z.	Oscar Newman

EBR Communication

For the second component of the index of receptivity, a set of 10 items asking for respondent's level of preference for different methods of communications was presented. This list of items was taken from Schmidt's (1984) study. The intent was to determine which methods were more preferred by the respondents. Methods of communication ranged from *Hiring an employee to specifically act as 'in-house' EBR translator*, *Computer access to EBR information retrieval system*, to *Changes in architectural / designer training with increased emphasis on design for behavioral factors.* The ratings were on a 5-point Likert scale from one as *Not Very Preferable* to five as *Very Preferable*, (Table 3.2.).

Table 3.2.

Methods of EBR Communications

Variable	Communication Method
V5a.	Hiring an employee to specifically act as "inhouse" EBR translator
V5b.	Public or privately funded EBR service agency, providing consulting and information dissemination on an "as need" basis
V5c.	Professional behavioral consultants subcontracted for specific projects
V5d.	Changes in architectural / designer training with increased emphasis on design for behavioral factors
V5e.	Continuing education programs for practicing architects / designers; such as short courses, workshops and conferences
V5f.	EBR information published in architectural / designer journals
V5g.	EBR information in a new journal written specifically for architects / designers, not for researchers
V5h.	AIA and IDA handbooks, supplements and contract documents dealing with EBR use in design
V5i.	Design guide books with EBR information organized by building type
V5j.	Computer access to EBR information retrieval system

EBR Propensity

      Architects' attitudes favoring or opposing the use of EBR, as the third component

of the index of receptivity, was measured though the use of a set of eight items.

Respondents rated their level of agreement on a 5-point Likert scale from one as *strongly*

disagree to five as *strongly agree*. These items were developed by Merrill and also used

by Schmidt and consisted of a list of statements reflecting attitudes opposing the use of

EBR. Merrill determined these statements should all be stated in the negative. For a more

accurate comparison between studies, Schmidt (1984) and the current study (2008)

replicated these questions exactly. This series of questions consisted of the most common

criticisms of EBR; such as, *Clients do not understand the point of using behavioral*

research, *The form in which behavioral research findings are presented is overly wordy*

and full of jargon, to *Behavioral research costs too much considering what it has to offer*,

(Table 3.3.).

Table 3.3.

Propensity to use EBR

VAR.	ITEM
V4a.	The form in which behavioral research findings are presented is overly wordy and full of jargon.
V4b.	Government codes and regulations allow the architect / designer the latitude to apply behavioral research findings.
V4c.	There are already too many things of at least as great importance as behavioral research for the architect / designer to consider.
V4d.	Behavioral research is of marginal importance since the architect / designer can generally do an adequate job when interpreting user needs for himself.
V4e.	Clients do not understand the point of using behavioral research.
V4f.	Behavioral research costs too much considering what it has to offer.
V4g.	Behavioral information is readily available to the architect / designer.
V4h.	There should be more emphasis on behavioral factors during architectural / design education.

Other Measures

In addition to the previously mentioned measures of receptivity – awareness, communication, and propensity – items describing the respondents were included as a means of giving more dimension to the measures of receptivity and were compared to responses from the previous studies. This was also done to determine respondent characteristics and compare those results to those found by Merrill and Schmidt to determine if the demographics of the sample changed in any significant way. Demographic items included age, gender, number of years in practice, position in firm, post secondary degrees obtained, area of specialization, number of design professionals in firm, and type of organizational setting.

Chapter Four

FINDINGS

The survey is about the uses architects and interior designers make of environment – behavior research (EBR) and how such research can make their work more relevant per their clients need(s). The current study is designed to identify changes in how design practitioners think about the functional relationship between EBR and architectural practice as originally identified by Merrill (1973) and Schmidt (1984).

Some empirical data exists on the application gap and the attitudes that cause it. This has resulted in members of the EBR community questioning architect and designer's attitudes towards EBR. Such as, *Do you see a need for EBR?*, *Would you hire an EBR consultant or make them part of your staff?*, *Do you find EBR research findings easy to use?*.

As a means of identifying the application gap, questions were devised to measure respondent's receptivity toward EBR and were named awareness (*Do you know of EBR?*), communication *(What is your preferred method of EBR communication?), and* propensity *(What are your attitudes for or against using EBR in design?).*

A list of 82 questions, to cover the above queries, was compiled. Most of these questions were drawn from the 1984 and 1973 studies. The content of the questions, for the most part, fell into one of the following three categories: 1) *How much do you know about EBR?,* 2) *Do you think EBR is useful for design?*, and 3) *Would you use EBR in design?*

Demographics

Included in the 82 questions were also questions about demographics. A preliminary examination of respondent characteristics was used in the data analysis. Respondents were asked their age, gender, number of years in practice, position in firm, post secondary degree(s) obtained, area of specialization, number of design professionals in firm, and type of organizational setting. Means and distribution frequencies were calculated for each of these descriptive variables - age range, gender, secondary education degree level obtained, number of years in professional practice, position in firm, primary area of professional specialization, number of design professionals in firm, and type of organizational setting.

Found in this study are only those survey findings that support or show change in findings from the 1984 and 1973 studies as compared to the current study or those that have a direct correlation to the purpose of this study – to identify changes in how design practitioners think about the functional relationship between EBR and architectural practice.

The following figure compares respondent age range from the current study to that of respondent age range in the 1973 and 1984 studies (Figure 4.1).
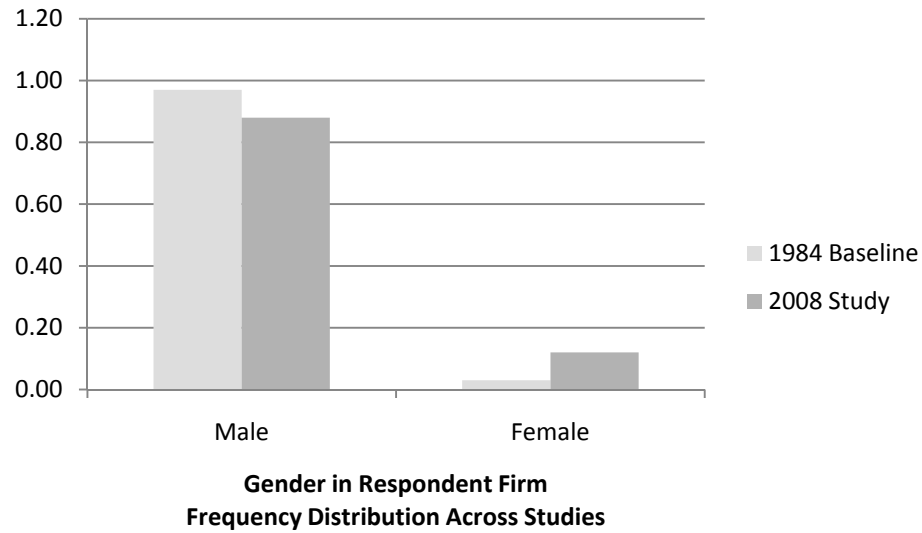
Figure 4.1. Respondents Age Frequency Percentage Distribution Across Studies

Respondents Age Frequency Distribution Across Studies
Mean and Standard Deviation
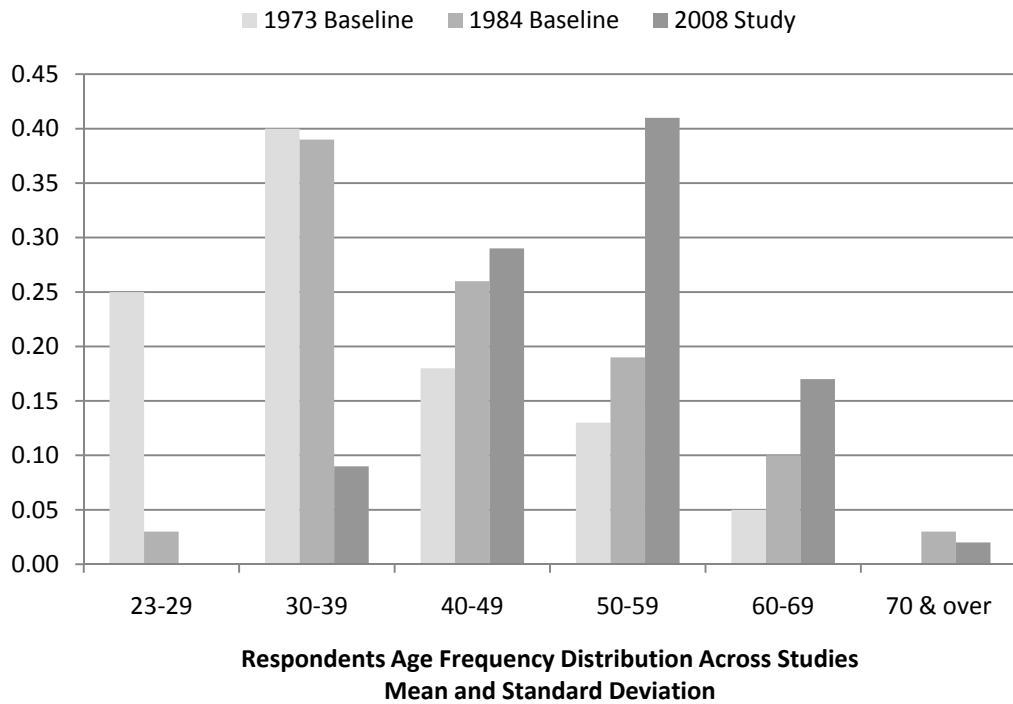
Figure 4.1. From the current study, respondents to the survey ranged in age from 31 years old to 75 years old with a mean of 50.2 years. In the 1984 study, respondents ranged in age from 26 years of age to 79 years of age with a mean age of 44.6 years. In the 1973 study, respondents ranged in age from 23 years old to over 70 years old.

The following figure presents respondent's gender from the current study and from the 1984 study (Figure 4.2).

Figure 4.2. Gender of Respondent Frequency Percentage Distribution Across Studies

Gender in Respondent Firm
**Frequency Distribution Across Studies**

Figure 4.2. While 88 percent of respondents to the 2008 survey were predominantly *male*, 97 percent respondents to the 1984 questionnaire were predominantly *male*.

The following figure compares respondents' level of post-secondary education from the current study to respondent's level of post-secondary education from the 1984 study (Figure 4.3).

Figure 4.3. Respondent Degree Frequency Percentage Distribution Across Studies

Respondent Degrees Frequency Distribution Across Studies
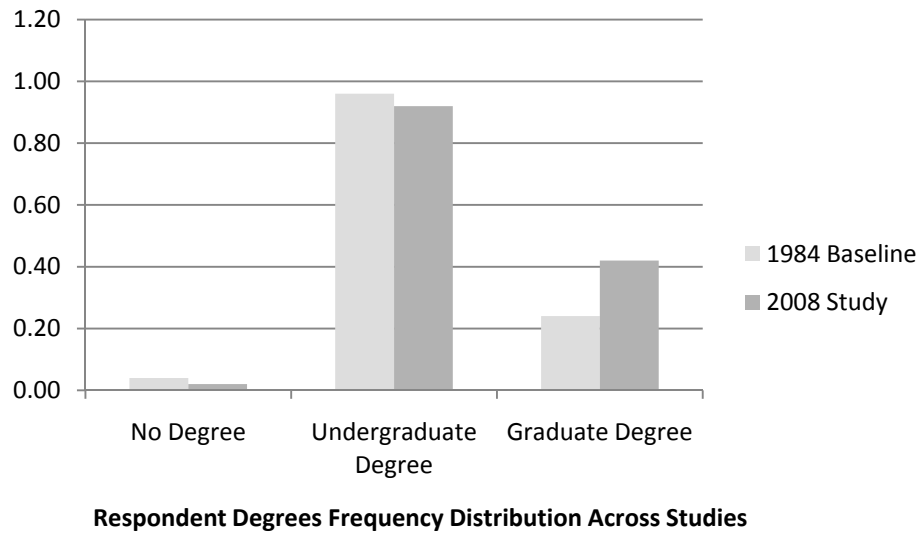
Figure 4.3. Of respondents from the current study, 92 percent have *Undergraduate Degrees* while 42 percent have *Graduate Degrees* and two percent have *No Degree*. The 1984 study respondents reported 24 percent with *Graduate Degrees* and four percent stated *No Degree*. Note the rise in the percentage of designers with graduate degrees from the 1984 study to the current study.

The following figure compares respondent's *Number of Years in Professional Practice* from the current study, to respondents *Number of Years in Professional Practice* from the 1973 and 1984 studies (Figure 4.4).

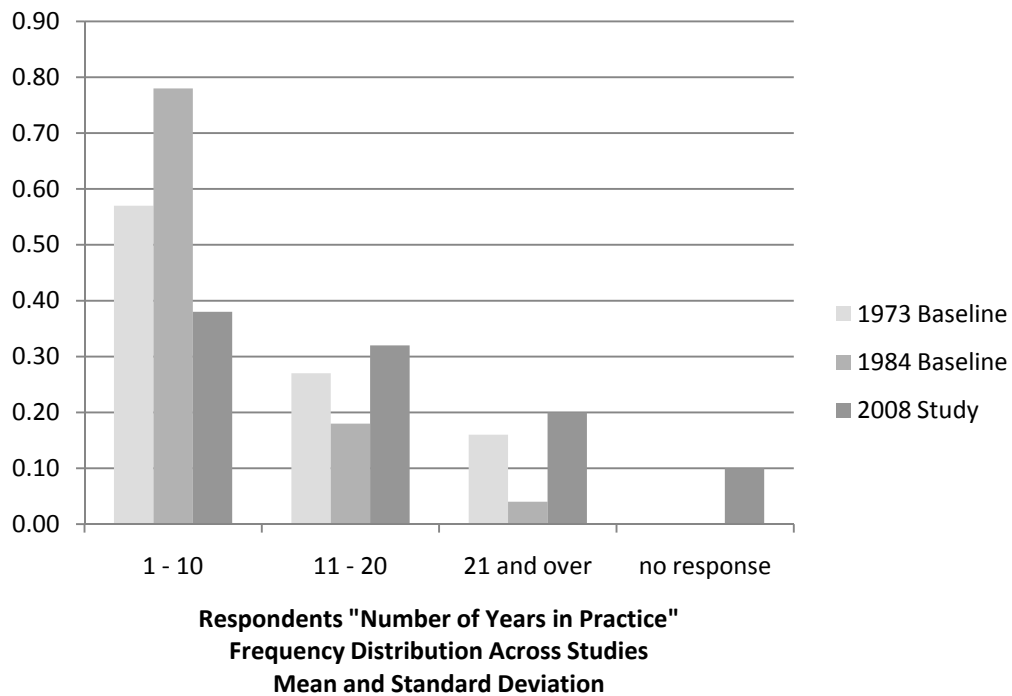**Figure 4.4. Respondent Number of Years in Practice Frequency Percentage Distribution Across Studies**

Respondents "Number of Years in Practice"
Frequency Distribution Across Studies
Mean and Standard Deviation

Figure 4.4. From the study, respondents *Number of Years in Professional Practice* ranged from one to 54 years with a mean of 24.2 (S.D. = 11.3). While the 1984 respondents ranged from zero to 56 for *Number of Years in Professional Practice*, with a mean of 17.8 (S.D. = 10.8). And respondents from the 1973 study ranged from one to over 25 for *Number of Years in Professional Practice* with eight percent not replying.

55

The following figure compares respondent's *Position in Firm* from the current study, to respondent's *Position in Firm* from the 1973 and 1984 studies (Figure 4.5).

Figure 4.5. Respondent Position in Firm Frequency Percentage Distribution Across Studies

Respondent Position in Firm Frequency Distribution Across Studies
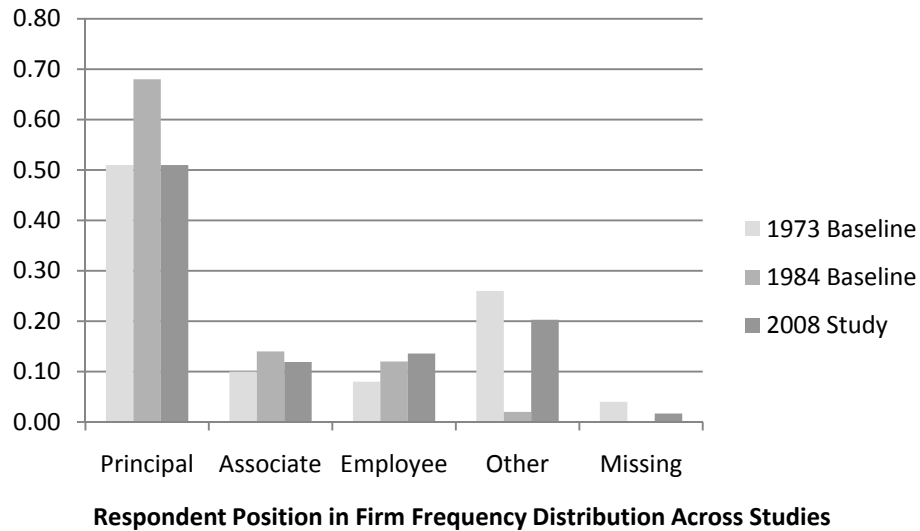
Figure 4.5. In the current study, 51 percent of respondents were *Principals* in their firm with 68 percent of respondents from the 1984 study as *Principals* and 51 percent of 1973 respondents as *Principals*. Interestingly 20 percent of the current study respondents reported *Other* as their position, versus only two percent of respondents from the 1984 study and 26 percent from the 1973 study. Respondent choices were *Principal*, *Associate*, *Employee* or *Other*.

The following figure compares the *Number of Design Professionals* in respondent's firm from the current study to the *Number of Design Professionals* in respondent's firm from the 1973 and 1984 studies (Figure 4.6).

Figure 4.6. Number of Design Professionals in Respondents Firm Frequency Percentage Distribution Across Studies
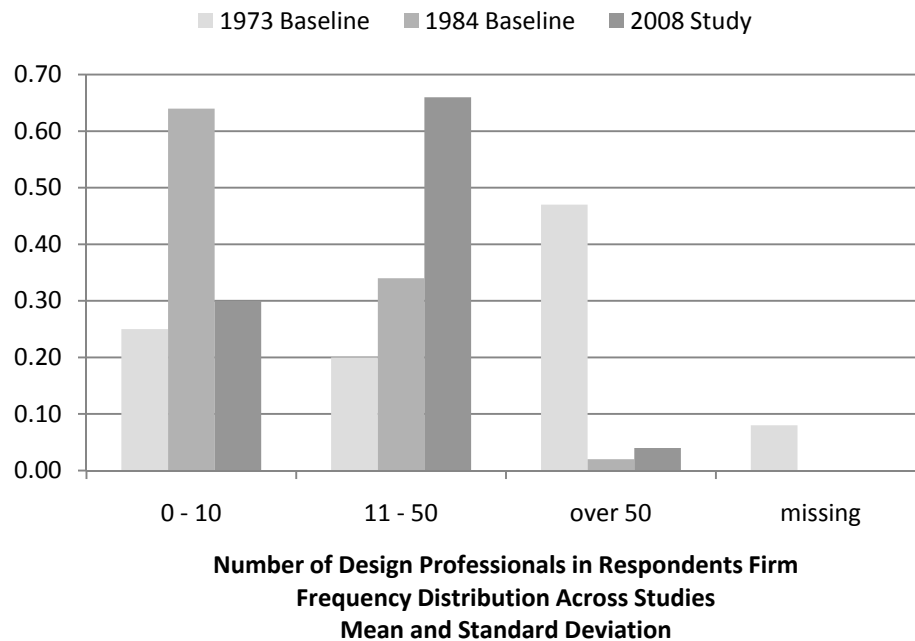
Figure 4.6. The current study found the *Number of Design Professionals* in respondent's firm ranged from one to 1600, with 66 percent of respondents working in firms with 11 to 20 design professionals. The 1984 study found the *Number of Design Professionals* in their firm ranged from zero to 500, with 64 percent working in firms with zero to 10 design professionals. While the 1973 study found *Number of Design Professionals* in respondent's firm ranged from one to 100 plus, with 47 percent of respondents working in firms with over 50 design professionals.

The following figure compares the percentage of respondent's from the current study reporting *Design* as their primary area of specialization to the percentage of respondent's reporting *Design* as their primary area of specialization in the 1973 and the 1984 studies (Figure 4.7).

Figure 4.7. Respondent professional effort spent – from greatest percent of time to least percent of time – Frequency Percentage Distribution Across Studies
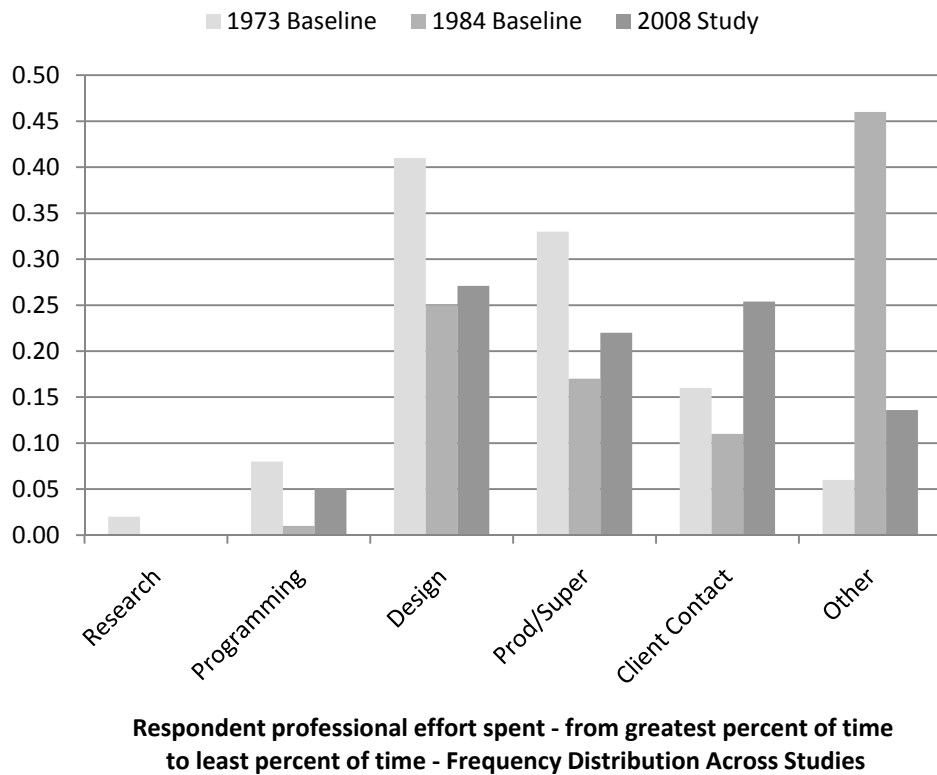

Respondent professional effort spent - from greatest percent of time to least percent of time - Frequency Distribution Across Studies

Figure 4.7. From the current study, 27 percent of respondents reported *Design* as their primary area of specialization while the 1984 study found 25 percent and the 1973 study found 41 percent reporting *Design* as their primary area of specialization. In the 1984 study, the category of *Other* appears to be the largest because respondents marking more

than one area of specialization were coded by Schmidt as *Other*. From the current study

and the 1984 study, no one reported *Research* as a primary area of specialization and only

two percent from the 1973 study reported *Research* as a primary area of specialization.

The following figure compares the type of organizational setting that most closely

defines the current study respondent's place of work to the type of organizational setting

that most closely defines respondent's place of work in the 1984 study (Figure 4.8).

Figure 4.8. Respondent Organizational Setting Frequency Percentage Distribution Across Studies
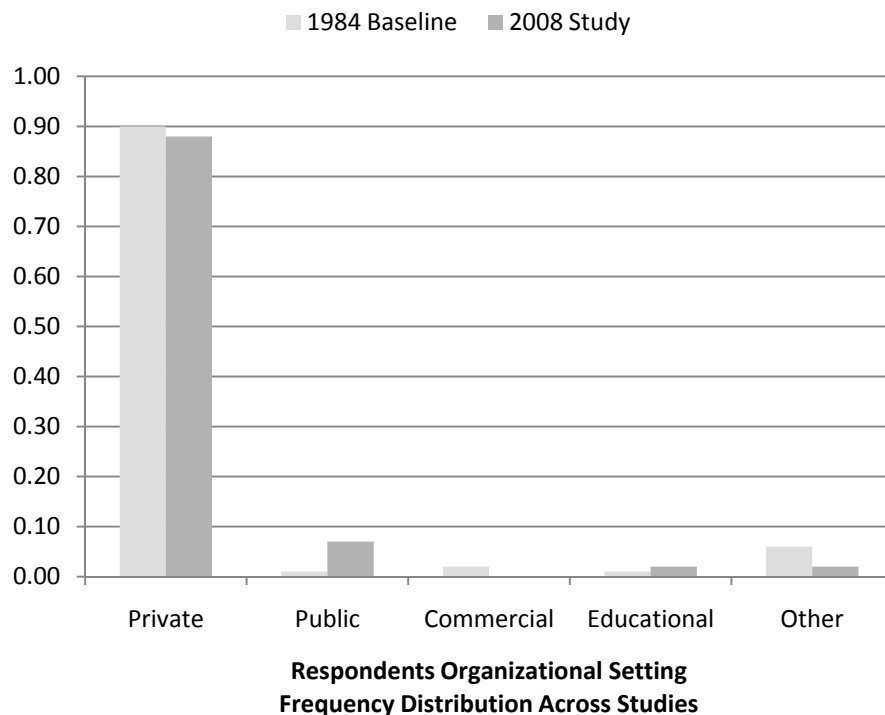
Figure 4.8. This last item in the descriptive profile asked respondents to select the type

of organizational setting that most closely defines their place of work. Respondents could

select from only one of five categories; 1) *Private Professional Architectural Practice /*

Design Firm, 2) *Public Agency*, 3) *Commercial / Manufacturing Firm*, 4) *Educational /*

Teaching Setting, or 5) *Other*. Less than 12 percent of respondents from the current study

work in organizational settings other than *Private Architectural Practice*. The 1984 study

recorded less than 10 percent of respondents working in organizational settings other than

Private Architectural Practice.

Propensity

This section of the survey focused on respondent propensity (attitudes) favoring

or opposing the use of EBR in design. A list of comments and criticisms about EBR were

presented to respondents. Respondents were asked to indicate their level of agreement or

disagreement with each statement. Item wording was varied so that the statements were

not consistently positive or negative. These polarities were regularly reversed in order to

avoid the problem of response set bias. Respondents were asked to rank statements about

EBR and design. Response choices ranged from *strongly agree* as five and *strongly*

*disagree* as one using a 5-point Likert scale (Table 4.4).

Table 4.4. Current Study Mean Propensity Rank

VAR.	RANK	MEAN	S.D.	ITEM
V4e.	1	3.6	1.01	Clients do not understand the point of using behavioral research.
V4h.	2	3.4	1.00	There should be more emphasis on behavioral factors during architectural / design education.
V4a.	3	3.2	1.01	The form in which behavioral research findings are presented is overly wordy and full of jargon.
V4f.	4	2.8	0.97	Behavioral research costs too much considering what it has to offer.
V4b.	5	2.8	0.98	Government codes and regulations allow the architect / designer the latitude to apply behavioral research findings.
V4c.	6	2.7	1.00	There are already too many things of at least as great importance as behavioral research for the architect / designer to consider.
V4g.	7	2.4	1.06	Behavioral information is readily available to the architect / designer.
V4d.	8	2.4	0.98	Behavioral research is of marginal importance since the architect / designer can generally do an adequate job when interpreting user needs for himself.

61

Propensity to use EBR was similarly measured on an 8-point Likert scale with eight being *most important* to one as *least important* (Figure 4.9).

Figure 4.9. Respondent Propensity to use EBR Frequency Distribution Rank Across Studies
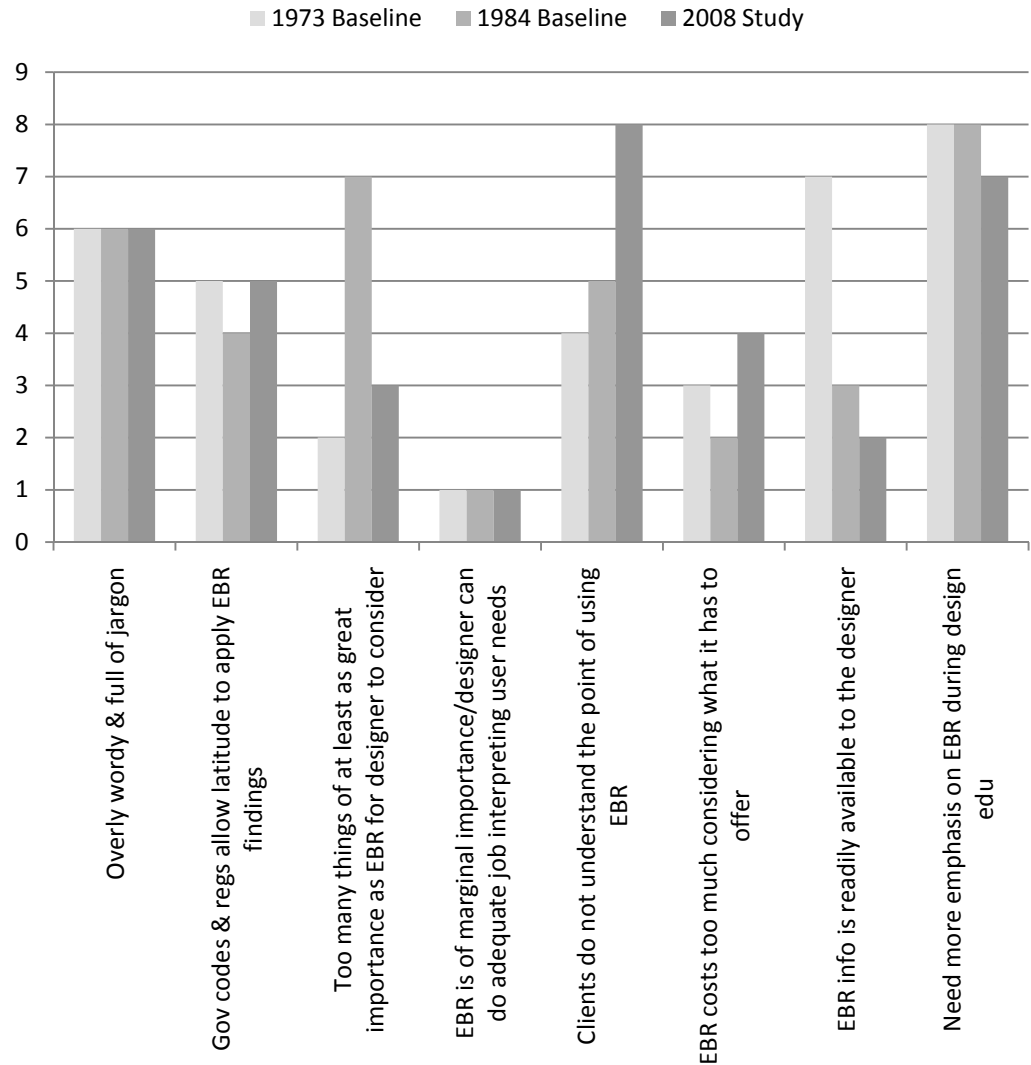
Rank: 8 = most important; 1 = least important

Respondent Propensity to use EBR
Frequency Distribution Across Studies

Figure 4.9. Note the same ranking of importance across studies for designer's propensity to use EBR for the item: *Overly Wordy and Full of Jargon*. And same or similar ranking for the EBR item: *Need More Emphasis on EBR During Design Education*.

Chapter 5

CONCLUSIONS

While architects show a desire for behavioral research information, as indicated in the 1984 and this current study, all studies also show they rarely use it. Respondents indicated *EBR is of marginal importance* to them because it was felt *designers can do an adequate job interpreting user needs* without the additional need of EBR (see Figure 4.4, p. 55). This thought has been a common thread in the two previous studies and continues in the current study. Across the board, respondents also felt EBR *Overly Wordy and Full of Jargon* (see Figure 4.4, p. 55) making it difficult to interpret and therefore use. This supports the findings of the previous two studies as well as and Karpan (2005) who noted the need to make EBR more user friendly. However, Seidel (1981) tells us ". . . the problem may be more basic than simply using a commonly understood jargon. It may be the more basic problem of attaining common conceptualizations of how to view an EBR issue . . . then, even with a common jargon, they would be talking past each other" (p. 9).

Respondents in all three studies indicated a *need for more emphasis on EBR during design education*. This need is reiterated in the findings of the 2002 AIAS Task Force Report where, "promoting a culture of sharing" is the third of five essential values as laid out in the *NewVisions, Shared Values* section (p. 19). Karpan (2005) and Oliver (2005) also identify the need for greater collaboration between designers, environment-behavior researchers and design educators. This finding is similarly supported by findings in the 2002 AIAS Task Force Report.

64

Awareness

As the first component in the index of receptivity, awareness was based on a set of survey items aimed at eliciting the architects' level of awareness of the field of EBR – *Do you know of EBR?* These EBR items included popular books, authors, concepts, organizations and contributors to EBR.

Determining level of awareness with an array of 26 EBR related items was needed before asking respondents to rank importance of tasks. The tasks selected were generally considered to be among the important goals of architecture. Respondents were then asked how often they used one of seven means of obtaining information about the people for whom the architect design.

Responses to the 26 items were ranked, the mean awareness score calculated, and the standard deviation determined. All items that constitute the index of receptivity were measured on a 5-point Likert scale. Although ordinally measured, the data approximates interval level data and are treated as such for the purpose of analyses – an assumption common in the social sciences because it allows for the use of more powerful statistical techniques.

The survey item *barrier free design* was determined to be most familiar to current study respondents with a mean of 4.5 on a 5-point Likert scale, with *architectural legibility & wayfinding* and *design for the elderly* tied for second with a mean of 3.3 (Table 5.5).

Table 5.5. Current Study EBR Items: Mean Awareness Rank

Variable	Rank	Mean	S.D.	Item
V1e.	1	4.5	0.9	barrier free design
V1l.	2	3.3	1.3	architectural legibility & wayfinding
V1i.	3	3.3	1.3	design for the elderly
V1q.	4	3.2	1.4	*Progressive Architecture* research awards
V1b.	5	3.2	1.5	*A Pattern Language*
V1f.	6	2.9	1.4	Kevin Lynch
V1n.	7	2.9	1.6	Christopher Alexander
V1g.	8	2.8	1.5	behavior based post occupancy evaluations
V1w.	9	2.8	1.3	*Personal Space*
V1c.	10	2.7	1.1	behavior based design programing
V1o.	11	2.7	1.3	behavioral issues in school design
V1u.	12	2.6	1.4	behavioral issues in health care design
V1j.	13	2.5	1.2	AIA Research Corporation
V1p.	14	2.5	1.5	Caudill Rowlett Scott
V1s.	15	2.4	1.2	behavioral issues in public housing design
V1m.	16	2.2	1.5	*The World is Flat*
V1v.	17	1.7	1.1	Ezra Eherencrantz
V1z.	18	1.7	1.2	Oscar Newman
V1r.	19	1.6	1.2	Edward Hall
V1a.	20	1.4	0.9	EDRA
V1t.	21	1.4	1.0	Clare Cooper Marcus
V1x.	22	1.3	0.9	Henry Sanoff
V1h.	23	1.3	0.7	John Zeisel
V1d.	24	1.1	0.4	CM Deasy
V1y.	25	1.1	0.4	Coolfont Model
V1k.	26	1.1	0.4	Leon Pastalan

The 1984 study also found that *barrier free design* was the most familiar item with a mean of 4.6 on a 5-point Likert scale. The item with the lowest score, found by both the current study and the 1984 study, was the *Coolfont Model*, with a mean score of 1.1 by both.

In the 1984 study, the *AIA Research Corporation* ranked fourth while in the current study the *AIA Research Corporation* ranked 14th. Schmidt (1984) queried the *AIA Research Corporation* ranking, questioning whether the respondents (AIA members) were familiar with *AIA Research Corporation*, or responded because they recognized the acyronym AIA. One then wonders how valid the high ranking for the *AIA Research Corporation* is when the *Coolfont Model* ranked 25th considering the *Coolfont Model* is a product of the *AIA Research Corporation*. As a note of interest, the *Coolfont Model* is a process model for collaboration between architects and environment-behavior researchers as the result of an AIA conference/workshop of leading architects and researchers held in 1973. At that time, it was promoted as the state of the art in collaboration models.

Given that this conference was held 37 years ago – long before some of the current respondents were even born – it could easily be argued that this item may not be reflective of much more than its longevity obscurity. However, when you look at the mean age of the current respondents, 50.17 years, and compare it to the mean age of respondents from the 1984 study, 44.6 years, it could said that many of the current respondents, as well as 1984 respondents, should have been aware of the *Coolfont Model*. Unless, as referenced above, it was never more than an obscure process that never found a firm foothold in the design profession (Figure 5.10, p. 69).

Also of interest is how respondents ranked their awareness of Alexander's *A Pattern Language* (1977). While respondents from the current study ranked *A Pattern Language* fourth, respondents from the 1984 study ranked it sixteenth. Considering the book had been in use for approximately 20 years at the time of the 1984 study, one wonders why there was such a difference in ranking. Is it more widely studied or used today that it was in the mid-1980s? Or does it have more to do with exposure to Alexander's writings? If a wider dissemination today is argued, it begs the question: did architects, currently in practice, receive as much exposure to Alexander's writings as do current design students or vice versa?

The only deviation in rankings between the two groups in the list of EBR was the addition of *The World is Flat* and the deletion of *ecological psychology* in the 2008 survey. This substitution was made in order to gage respondent awareness of a more recent, albeit, non-peer reviewed but popular, publication, *The World is Flat*, while keeping the number of EBR items at the same count (Figure 5.10).

Figure 5.10. Respondent level of familiarity with various EBR related items Frequency Percentage Distribution Across Studies
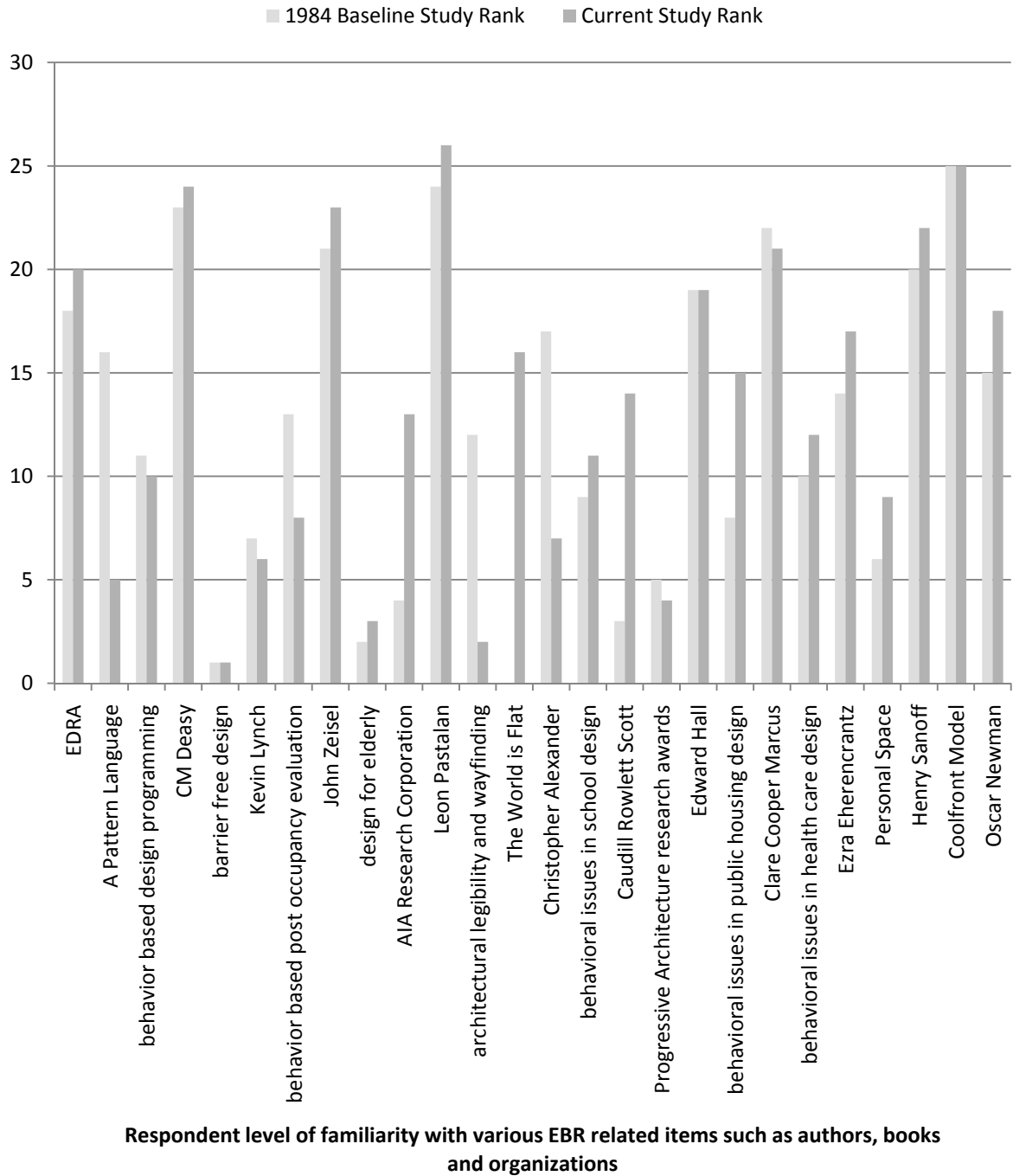
Figure 5.10. Note the close rankings between studies of a number of EBR related items.

EBR Communication

For the second component of the index of receptivity, a set of 10 items asking for respondents' level of preference for different methods of communications were presented. The 2008 survey items are exactly extracted from the 1984 study. The intent was to determine which methods were more preferred by the respondents. Methods of communication ranged from *Hiring an employee to specifically act as 'in-house' EBR translator*, *Computer access to EBR information retrieval system*, to *Changes in architectural / designer training with increased emphasis on design for behavioral factors*.

Responses to these 10 items were ranked, the mean awareness score calculated, and the standard deviation determined. All items that constitute the index of receptivity were measured on a 5-point Likert scale with one as *Not Very Preferable* to five as *Very Preferable*. *Continuing education programs for practicing architects / designers; such as short courses, workshops and conferences* was determined to be the most preferred method of communication by current study respondents with a mean of 4.2 on a 5-point Likert scale, with *Design guide books with EBR information organized by building type* and *Computer access to EBR information retrieval system* ranking second and third with a mean of 4.2 and 4.1 respectively (Table 5.6).

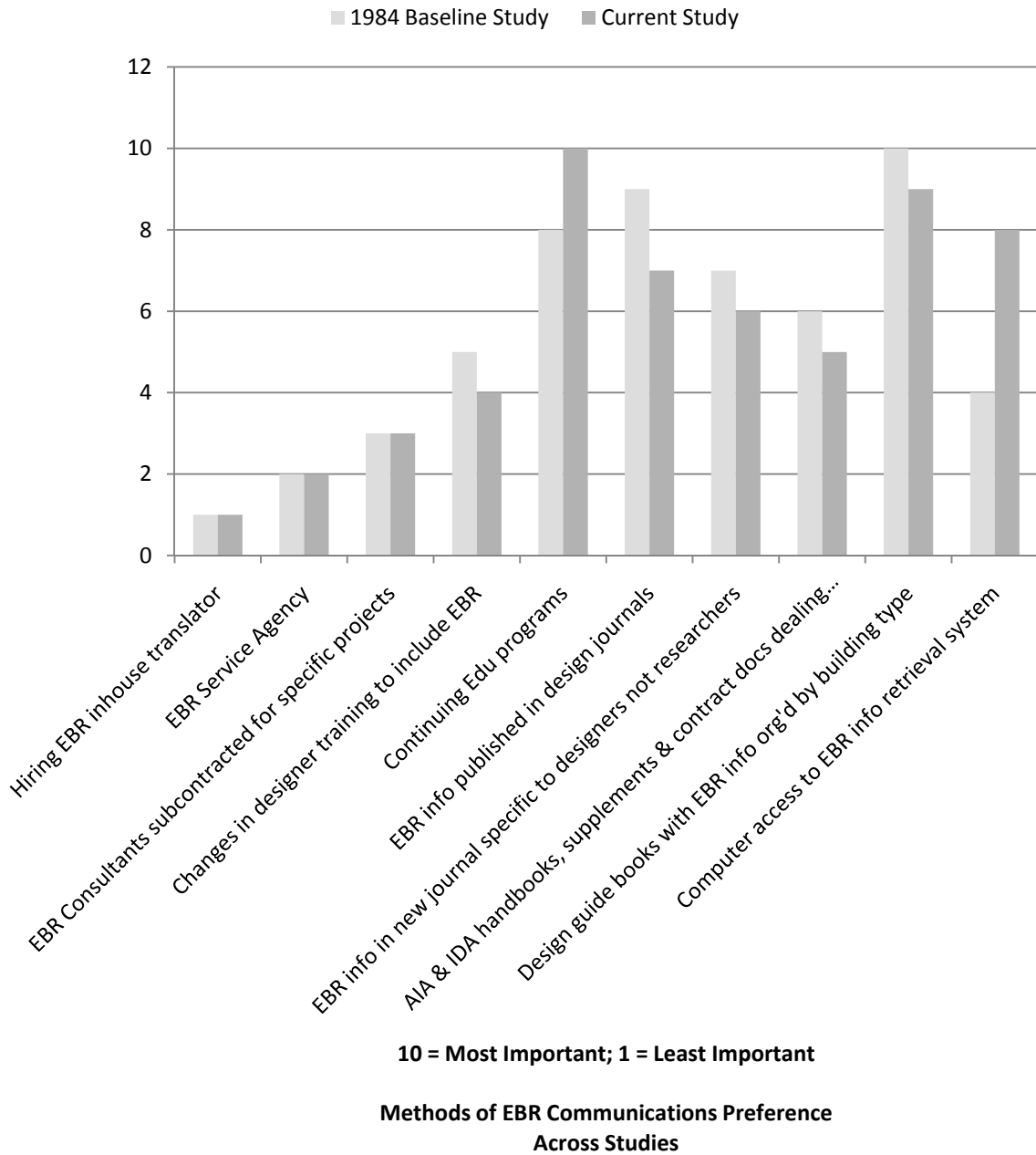**Table 5.6. Current Study Mean Communication Ranked**

Variable	Rank	Mean	S.D.	Item
V5e.	1	4.2	.95	Continuing education programs for practicing architects / designers; such as short courses, workshops and conferences
V5i.	2	4.2	.97	Design guide books with EBR information organized by building type
V5j.	3	4.1	1.04	Computer access to EBR information retrieval system
V5f.	4	3.9	.99	EBR information published in architectural / designer journals
V5g.	5	3.7	1.13	EBR information in a new journal written specifically for architects / designers, not for researchers
V5d.	6	3.5	1.07	Changes in architectural / designer training with increased emphasis on design for behavioral factors.
V5h.	7	3.4	1.20	AIA and IDA handbooks, supplements and contract documents dealing with EBR use in design.
V5c.	8	3.2	1.36	Professional behavioral consultants subcontracted for specific projects.
V5b.	9	2.7	1.19	Public or privately funded EBR service agency, providing consulting and information dissemination on an "as need" basis.
V5a.	10	1.6	.89	Hiring an employee to specifically act as "in-house" EBR translator.

Only one item between the two studies showed any notable difference in ranking.

Respondents, in the current study, ranked *Computer access to EBR information retrieval*

71

system four places lower than respondents in the 1984 study. Considering computers are

more readily accessible in this day and age – it would be rare to find an individual who

does not have a computer on their desk at work – and computers are also more user

friendly and research findings are more readily available through a search of the World

Wide Web, it is interesting to note that *Computer access to EBR information retrieval*

system ranked lower in this study compared to the 1984 study (Figure 5.11).

Figure 5.11. Methods of EBR Communication Preference Ranked Across Studies

■ 1984 Baseline Study   ■ Current Study

10 = Most Important; 1 = Least Important

**Methods of EBR Communications Preference
Across Studies**

Figure 5.11. Note the same or close rankings between studies on most items with

Computer access to EBR info retrieval system showing the greatest difference in rank.

Propensity

      Architects' attitudes favoring or opposing the use of EBR was measured though a list of eight comments and criticisms about EBR. Respondents were asked to indicate their level of agreement or disagreement with each comment or criticism. All items that constitute the index of receptivity were measured on a 5-point Likert scale from one as *strongly disagree* to five as *strongly agree*.

      These comments and criticisms were developed by Merrill (1973), used by Schmidt (1984) and consisted of the most common criticisms of EBR; such as, *Clients do not understand the point of using behavioral research*, *The form in which behavioral research findings are presented is overly wordy and full of jargon*, to comments such as, *Behavioral research is readily available to the architect / designer* (Table 5.7).

Table 5.7. Current Study Propensity to Use EBR Ranked

VAR.	RANK	MEAN	S.D.	ITEM
V4e.	1	3.6	1.01	Clients do not understand the point of using behavioral research.
V4h.	2	3.4	1.00	There should be more emphasis on behavioral factors during architectural / design education.
V4a.	3	3.2	1.01	The form in which behavioral research findings are presented is overly wordy and full of jargon.
V4f.	4	2.8	0.97	Behavioral research costs too much considering what it has to offer.
V4b.	5	2.8	0.98	Government codes and regulations allow the architect / designer the latitude to apply behavioral research findings.
V4c.	6	2.7	1.00	There are already too many things of at least as great importance as behavioral research for the architect / designer to consider.
V4g.	7	2.4	1.06	Behavioral information is readily available to the architect / designer.
V4d.	8	2.4	0.98	Behavioral research is of marginal importance since the architect / designer can generally do an adequate job when interpreting user needs for himself.

"1" as most important to "8" as least important.

The current study findings support those in earlier research by Merrill (1973) and Schmidt (1984) who state architects and designers see a need for EBR but rarely use it. In the current study, 61 percent of respondents stated agreement with the statement, *Clients do not understand the point of using behavioral research*. While 56 percent of respondents neither agreed nor disagreed with the statement, *The form in which behavioral research findings are presented is overly wordy and full of jargon*. Interestingly, 54 percent of respondents stated disagreement with the statement, *Behavioral information is readily available to the architect / designer*.

Considering the number of respondents who agreed with the statement, *Clients do not understand the point of using behavioral research*, one wonders, is it that clients really do not understand the point of using behavioral research or is it that designers do not fully understand behavioral research themselves? Or perhaps architects do not promote the use of EBR to their clients because they are frustrated with trying to translate research in to a useable format, or have little exposure to EBR during their design education, hence, they lack understanding (benefit) of EBR (Figure 5.12).

Figure 5.12. Respondent Propensity to Use EBR Frequency Distribution Ranked Across Studies

Legend: 1973 Baseline Study ■ 1984 Baseline Study ■ Current Study

Categories (x-axis):
- Overly wordy & full of jargon
- Gov codes & regs allow latitude to apply EBR findings
- Too many things of at least as great importance as EBR for designer to consider
- EBR is of marginal importance/designer can do adequate job interpreting user needs
- Clients do not understand the point of using EBR
- EBR costs too much considering what it has to offer
- EBR info is readily available to the designer
- Need more emphasis on EBR during design edu

8 = Least Important; 1 = Most Important

Respondent Propensity to use EBR Frequency Distribution Across Studies

Figure 5.12. Worth noting, when comparing the findings from the current study to the 1973 and 1984 studies it was found that a high number of respondents in each study agreed with the statement, *There should be more emphasis on behavioral factors during architectural / design education.*

77

Utility

This section of the survey, originally developed by Merrill (1973), represents a

sampling of EBR information as related to goal importance, or ideology, of the

professional architect and designer. Respondents were asked to rate each use of EBR in

terms of its usefulness in their design process with one indicating the *most important* and

four *least important*. These four goals were intended to represent the goals of the

behaviorist (*Environments that match needs*), the artist (*Creating appropriate visual*

forms), the functionalist (*Translating information in to physical forms*) and the

technologist (*Efficient buildings through innovative technology*) with the idea of

measuring the attitudes behind specific EBR issues.

The initial step in the analysis, as with the awareness component, was to calculate

the mean ratings for each of the four goals. On a 5-point Likert scale with 5 being…, the

means ranged from 3.0 to 1.1 (Figure 5.13).

Figure 5.13. Important Goals of Architecture Frequency Distribution Ranked Across Studies

1 = Most Important
2 = Important
3 = Somewhat Important
4 = Least Important

**Important Goals of Architecture
Frequency Distribution Across Studies**
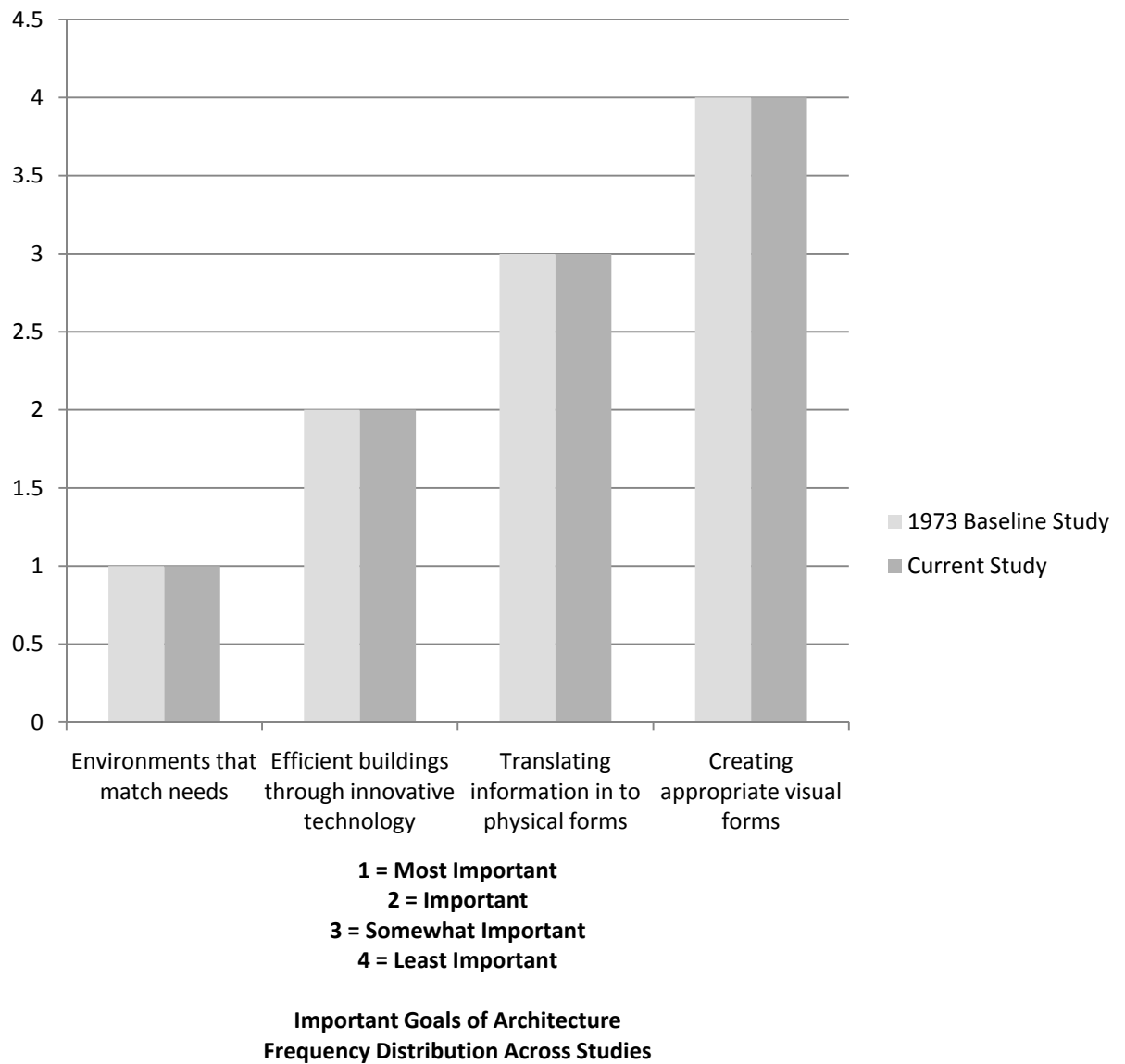
Figure 5.13. Note the rankings of importance are all the same in the study as in the 1973 study conducted by Merrill.

Schmidt, in his 1984 study, opted not to use this measure of overall design ideology stating, in his opinion, "these four goals of architecture were too general and would cause a strong 'on-stage' effect" (p. 28) – in other words, Schmidt believed the respondent was more likely to select the goal of architecture that the researcher wanted him to select. However, considering the like rankings from the 1973 study to the current study, one wonders could Schmidt be right or is it more likely respondents from both studies do feel it more important to design *Environments that match needs* versus *Creating appropriate visual forms*. This then leads one to ask, is this actually what happens in the design process - has the designer achieved an equal balance between "commodity", "firmness", and "delight"?

Consider also, if *Environments that match needs* ranked as most important while *Translating information in to physical forms* ranked as somewhat important. Then, if environments were designed to match needs, would that process not consist of translating information in to physical forms?

Obtaining Client Information Means Calculation

In the third section of the survey, to support the goals of the architect, respondents were asked to select their level of agreement when describing how often they would use each of seven means of obtaining information about the people for whom respondents design. Responses to these seven items were ranked, the mean awareness score calculated, and the standard deviation determined. On a 5-point Likert scale, the level of agreement ranged from *strongly agree* as five to, *not at all* as one (Figure 5.14).

Figure 5.14. Use of Client Information Gathering Item Frequency Distribution Ranked Across Studies
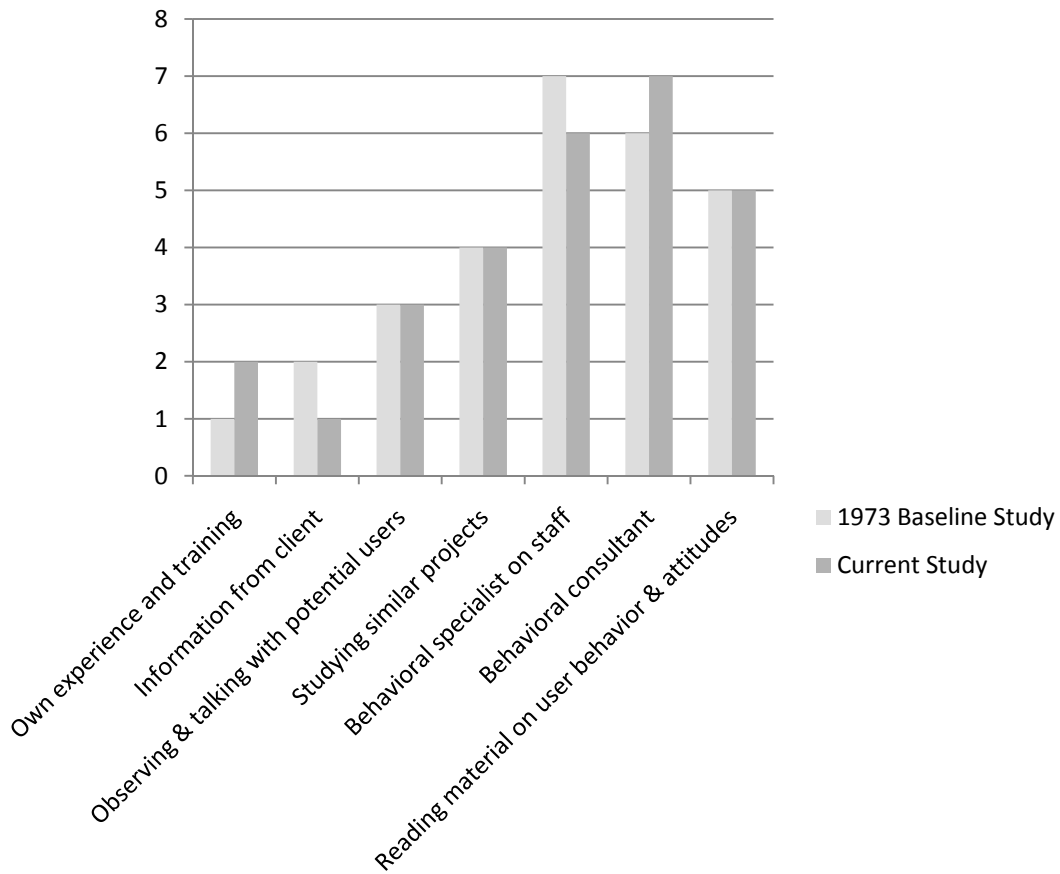
Rank: 1 = Highest Use; 7 = Lowest Use

How Often Respondent Uses Item to Obtain Client Information
Frequency Distribution Across Studies

Figure 5.14. Comparison of findings between the current study and the 1973 study, show little difference in the rank of each statement between the studies, but, in both studies, *Your own experience and training* and *Information provided by the client* ranked higher than *Behavioral specialists on your own staff*, and *Behavior consultant*.

81

Overview of Comparison Studies

This study on the application gap - a disconnect between EBR and its use by the design profession - is a follow-up to a previous study by Fred Schmidt (1984) and includes relevant findings from a study by John Merrill (1973), and to a lesser extent, relevant findings from a study by Cynthia Karpan (2005), the 2002 AIAS (American Institute of Architectural Students) Studio Culture Task Force Report, and, from Joshua Oliver (2005) who acknowledges the existence of the application gap in his study. The current survey mimics selected survey questions originally developed by Merrill for his 1973 study and duplicated by Schmidt in his 1984 study. This duplication included not only wording of questions but also wording of response choices. The current survey can be found in *Appendix A* (p. 97), the 1984 survey in *Appendix B* (p. 105), and the 1973 survey in *Appendix C* (p. 110).

Schmidt (1984), stated responses in the utility component of his study show architects to be convinced of the usefulness of EBR. From his findings, Schmidt concludes that "researchers need to understand that architects are not blind to new opportunities to improve their designs" (p. 108). He goes on to say, the use of any new approach (to bridge the application gap) must fit the restrictions of professional and business practices. In other words, the utilization of EBR in design must demonstrate that it is a useful tool "that can be used without a substantial loss of cash or control" (p. 108). Since the status quo of the architectural profession does not require the use of EBR, the onus of application falls to the researchers. Schmidt believes researchers could claim the same - the status quo of their profession will continue without efforts (on the part of

architects) at application. He adds that architects say they would use EBR if it was in a design guide format, but researchers say that their job is to produce research, not design guides. Schmidt cites Seidel (1980) who believes there are actually disincentives for researchers to produce design guidelines because such work would not get credit in peer reviewed publications, and therefore does little to increase the researcher's professional status.

Schmidt (1984) goes on to suggest, since neither architects nor researchers feel directly responsible for the translation of EBR findings into forms that are useable by architects, perhaps schools of architecture could develop specific programs of study for training EBR translators. The creation of an EBR translator role would likely result in future practitioners who are more receptive to using EBR ultimately resulting in more EBR translations, an improved market and end product, and more practitioners. Schmidt goes on to suggest that EBR findings, in the design guide format, should be disseminated in architectural journals – the preferred method of communication by architects surveyed. Schmidt infers, as time goes by, and more EBR is translated into usable forms, other forms of preferred communication will be identified and implemented; such as continuing education programs, which ranked third in his study. Schmidt concludes, if EBR was emphasized in more architectural schools, a parallel rise in awareness will occur among the general public, which includes clients, and as clients become more aware of the benefits of using EBR, the demand for its use will increase.

Merrill, in his 1973 dissertation, states the chief purpose of his study "was to contribute to a clearer definition of the so-called application gap" (p. 101). He indicated

respondents, architects, rated a variety of different research findings as useful and various

functions of EBR in design as important indicating their attitude toward EBR was

generally positive. Merrill cited, "over two-thirds of the sample strongly agreed that there

should be more emphasis on behavioral factors during architectural education" (p. 101).

However, he comments, these same respondents state they rarely use EBR even though

they feel that information provided by EBR can help them. Merrill attributes this

affirmation of usefulness is likely based primarily on a sense of need for EBR

information rather than actual qualities of research information. He did note that a few

respondents, who had actual experience with environmental behavior researchers, did

register somewhat more positive feelings toward EBR indicating that experience appears

not to have an adverse effect on attitudes about EBR.

Additional findings of interest in Merrill's study (1973) indicate two-thirds of the

"respondents strongly agreed that EBR was not readily available to architects" (p. 102).

And, "behavioral research information was seen as full of jargon and excess verbiage" (p.

102). While Merrill's study was not aimed at developing solutions to the application gap,

he indicated his immersion in the problem led to some strong convictions about the

directions in which solutions lie. In exploring possible solutions to the application gap

Merrill queries the possibility that access and communication problems may be

symptoms of more basic reasons for the application gap. And puts forth the idea that

perhaps the disconnect between how designers view the world and their need for EB

information is a mismatch to "the way EBR construes behavior" or that EBR is presented

in a way "that is incompatible with the designer's information acquisition and evaluation

style" (p. 103). Another issue addressed by Merrill is the immediate need designers have for EBR information versus the timeframe an environmental behavior researcher needs to design and conduct a research study.

Merrill (1973) suggests that possibly the logical point at which to begin to reduce the application gap is during the education of designers since this is a time "they are still formulating their professional paradigm . . . if architecture is truly designing for people . . . then it seems necessary that architectural design education should emphasize behavioral issues equally with other design issues" (p. 115). He also suggests researchers must develop a better match between their output and designer information needs through mechanisms that would join research and design. The mechanisms suggested were the development of a design extension service where behavioral information would be made available to design practitioners, on a low cost or free basis, through a system similar to the Cooperative Extension Service of the U.S. Department of Agriculture. And, as another mechanism to join research and the design practitioner needs, a network for designer-researcher collaboration where the designer and the researcher work together on common problems over an extended period of time. Merrill notes a side benefit to this mechanism is that direct contact during collaboration would allow the researcher to develop an understanding of the designer's needs. Merrill concludes by stating that others who may wish to continue the exploration of the application gap should include questions addressing criteria used by respondents in determining usefulness of EBR or ask respondents to distinguish between items they rate as most useful and those they rate as least useful in a written explanation.

85

The 2002 Report of the AIAS Studio Culture Task Force: *The Redesign of Studio Culture*, states the task force was charged with researching the current practices in architectural education and also targeting opportunities for positive change in studio culture. In the *A Call to Action* section of the report the task force members clearly state ". . . a need for change in order for architecture to develop and reach its potential" (p. 25). The report concludes by stating that now their challenge is to design a studio culture that promotes a wide range of goals and objectives – as listed in bullet form on page 26 of the report. A few of the bulleted items, which support the concept for the need to increase emphasis on behavioral factors in architectural schools as imperative, are as follows; "Design-thinking skills; Design process as much as design product; The importance of people, clients, users, communities, and society in design decisions; Understanding of the ethical, social, political, and economic forces that impact design" (p. 26). This challenge, to design a studio culture to address needed changes in the profession, fits with AIAS's mission, "to promote excellence in architectural education, training, and practice . . . and to organize students and combine their efforts to advance the art and science of architecture" (p. 1).

Karpan, in her 2005 dissertation, states the purpose of her study was "to investigate the nature and purpose of research in interior design" with "the objectives of developing a theoretical framework for research in interior design, and to describe the implications of the framework for post-secondary interior design programs in Canada and the United States" (p. 218). Karpan purports her findings "are consistent with those of Dickson and White's (1993), who found educators and practitioners 'speak different

languages'" (p. 219). Once Karpan ascertained participants' perceptions about research, she determined further analysis was necessary. The key form of analysis that took place was the generation of what Karpan called a Synoptic of Themes – eight themes that provided insight as to why it has been so difficult for interior design to establish a widespread research culture emerged. According to Karpan, "These eight themes led to the conclusion that in order for research to become a more significant part of the interior design profession, there needed to be a stronger, more developed research culture: a culture that not only academics and researcher would acknowledge, but that practitioners would acknowledge and embrace as well" (p. 221).

The identification of these themes led Karpan (2005) to develop the goals for the Theoretical Framework and to determine the need for three unique cultures – design, research and knowledge management. Karpan concluded that the establishment of a third culture – that of knowledge management – would go a long way in guaranteeing the profession would gain recognition as an evidence-based profession. Karpan recommends further research to test the Theoretical Framework to produce the kind of evidence needed in order to generalize the study findings to a larger population, and enable the evolution of the Framework from the level of substantive to practice theory. Additionally, she suggests further investigation in the area of curriculum content for the knowledge management program. And as a final suggestion, research the link between perceptions about the value of interior design and relevant research – "what kinds of topics do stakeholders believe need to be researched" (p. 227).

Although the body of theoretical and applied literature has grown considerably in EBR since 1973; there does not seem to be a corresponding evolution in its use - as confirmed by research findings from Schmidt (1984), Merrill (1973), and Karpan (2005). When you look at these selected findings and those from the current study, you discover several common threads – a consensus on the usefulness of EBR to the design profession, acknowledgement of the existence of a disconnect in communication between researchers and designers, and the role secondary education can play in reducing the application gap. And, when considering the span of time that has evolved between Merrill's 1973 study and the current study, one could say the application gap still exists, still causes concern in the profession, and that very little has been put in to place to reduce this gap. Even these studies show little evolution in their general survey queries indicating there has been little change recognized by the profession in closing the application gap.

Findings from Schmidt (1984), Merrill (1973) and the current study (2008) agree that each study shows architects to be convinced of the usefulness of EBR but rarely use it. Merrill suggests the designers believe EBR useful because of a sense of need and felt, as Schmidt does and as shown in the current study, practitioners rarely use it for several reasons – behavioral research information was seen as overly wordy and full of jargon; EBR information was not readily available to the designer. All three studies suggest research findings need to be translated in to forms more easily used by designers. Schmidt suggests schools of architecture develop specific programs of study for training EBR translators. Merrill suggests more emphasis on behavioral factors during architectural education as well as offering the subject in continuing education. And the

88

current study suggests a new paradigm in design education. Karpan (2005) suggests a similar solution, in order for research to become a more significant part of the design profession, a third culture in the secondary education process – beyond designer and researcher - is needed; that of knowledge management.

How does the current study add to or advance the previous studies? The current study confirms there is still a recognizable application gap and confirms designers – be they researchers or practitioners - still see a need to close that gap. However, this researcher recognizes the need for a more in-depth study that would go beyond reconfirming the application gap to exploring the issues that are preventing EBR from making an effective contribution to design practice. Although it is reasonable to believe, as Schmidt (1984), Merrill (1973) and this researcher concluded, including more EBR curriculum in secondary and post secondary education as well as presenting EBR in a more user-friendly format and making it more readily accessible to design practitioners adds value to the profession – designer and researcher alike – other reasons for non-use must still exist. In addition to raising awareness of EBR among design practitioners, the collateral professions and clients, there still exists a need to specifically identify the preferred vehicle(s) as well as preferred format(s).

Conclusion

To date, as noted earlier, it has been found that not all architects will be equally receptive to the use of EBR information in design, nor do they share the same preferences for communication methods. Previous studies by Schmidt (1984), Merrill (1973) and others (Karpan, 2005; Oliver, 2005) have indicated that architects are receptive to EBR

information but rarely use it. Widely accepted by designers are the three components of well building - "Firmness", "Commodity", and "Delight" (Wotton, 1624, p. 1xxxvii) which are considered to be of equal importance. At the turn of the previous century, when technology, taste, and economic forces converged and made it necessary to drop the conventional styles of the past - meaning the shape of a building could no longer be chosen out of the old pattern book - it was determined that the purpose of the building would dictate the form of the building. Hence architects began to adopt and profess the principal, credited to Sullivan (1896), "form ever follows function" (p. 104). Adherence to this belief by designers should lead to the use of EBR. Even Alexander (1964) noted that although ideally the form should reflect all the known information relevant to a design, the intuitive resolution of all this input in a contemporary design problem is beyond any individual's abilities. And now, in the twenty-first century, technology and the complexity of problems continue to grow at an even more rapid pace emphasizing a greater need for EBR and the use of EBR by architects and designers.

The use of EBR in the design process can increase the relevance of practitioners' work. In recent decades, a number of processes and procedures developed by EBR are regularly used today; such as, programming, advancements in the design for the elderly, advancements in the design of hospitals, post-occupancy evaluations, wayfinding, sick building syndrome, and many more. This development of processes and procedures confirms the relevance of EBR. The lack of use seems to stem from lack of knowledge about EBR, or possibly how to use EBR, or how to access and interpret EBR; this leads to lack of demand of EBR. As confirmed by such processes and procedures, as cited

90

above, where there has been a great need (demand) for EBR and its application, research has been done, processes and procedures developed, and put into use.

As the economic conditions of a society become restricted, the need for buildings to be more enduring increases. Because of these restricted economic conditions, clients or the general populace may apply (have already begun to apply) more pressure on the design profession to use EBR – because of the restricted economic conditions clients see a need for more sustainable buildings thus their awareness of EBR has been raised. And, again because of these restricted economic conditions, if any type of environmental sustainability/longevity is to be achieved, the complexity of design will increase, thus requiring architects and designers to access a wider swath of information across a greater number of disciplines. Because EBR is one vehicle with which designers have some familiarity, reluctance to delve in to EBR than to seek information in areas where they have not had some exposure may be mitigated.

AIAS's 2002 Task Force Report: *The Redesign of Studio Culture* states how studio culture is directly affected by rapidly changing technology, the fast flow of information, and the globalization of our society. They recommend redefining studio culture in design education as a means of addressing these changes stating design must be defined more broadly and be viewed as a process depending less on skill-based learning and more on the dissemination of knowledge as these design-thinking skills would then allow designers to build on their knowledge base and apply their abilities to an infinite number of applications. This change in studio culture can bridge or, at the very least, impact the practitioner-researcher gap by depending more on the dissemination of

91

knowledge and less on skill-based learning. The ability to apply knowledge and perspectives from multiple disciplines is integral to a foundation of sustainable design ethic. Design education needs to offer students a broader base of ideas from which to draw, different ways of knowing, different methods of research and analysis, and different approaches and attitudes. Simply stated, design education needs to put more emphasis on teaching problem solving skills. This is a paradigm shift from an almost absolute emphasis on synthesis to a more balanced approach achieved by increasing the student's analysis skills without sacrificing synthesis skill development.

Recommendations

Findings from the current study confirm findings from the research conducted by Merrill (1973), Schmidt (1984), Karpan (2005), Oliver (2005), and the AIAS Task Force Report (2002). All agree – and respondents surveyed agree - more emphasis on EBR is needed at the secondary education level if the practitioner-researcher gap is to be closed. Given the consistency of the findings to this particular survey item, one could conclude that future studies should focus more on how to change or enhance design education to embrace, what would be, a new paradigm in the design education process.

Change in design curriculum is an obvious choice to address the issue of bridging the design practitioner-researcher gap. However, change in design education curriculum is but one piece of bridging the gap. During the transition - of determining what's needed to change the educational process, putting the needed changes in place, then educating and graduating designers (professional architects, interior designers, landscape designers) with this new paradigm in place - there is still a gap. What is needed during this time of

transition is an integration of the new paradigm into the thinking and practice of professional designers currently in the design field, as well as those in collateral fields; such as current design students, educators, producers of design publications, psychologists, sociologists and environment-behavior researchers.

Additionally, changing the curriculum does not eliminate the need for environment-behavior researchers. As designers become more knowledgeable about the benefits of environment-behavior research, the need for EBR will increase. Schmidt (1984), Merrill (1973) found designers did not use EBR for several reasons – as cited in this survey - *The form in which behavioral research findings are presented is overly wordy and full of jargon*, *Behavioral research costs too much considering what it has to offer* and *Clients do not understand the point of using behavioral research*. Behavioral research findings are often difficult to interpret even by the most research savvy designer and when it is not required – as would be when building codes, such as post-occupancy evaluation, require certain methods or procedures - the effort is often not made. Too often clients do not understand the point of using behavior research. Although, their lack of understanding may be attributed to the designer not understanding the value of using behavior research or being unable to explain the value and benefit of including EBR as a necessary part of the design process.

As pointed out by Karpan (2005), Friedman (2005), and in the AIAS Task Force Report (2002), changes in technology and application occur on almost a daily basis making it difficult to stay current. It is argued here that many designers would agree with their findings - changes or new regulations and codes occur on a regular basis making it

93

difficult to stay current. With this fast rate of change and additions to technology and codes it is almost impossible for one person to design with the confidence of being fully compliant or at a level of expertise to provide the client with the best end product. However, with the new paradigm in teaching design education, students will graduate with a greater ability to problem solve, with a greater knowledge resource base, and, one would hope, with a greater appreciation of the importance of EBR.

For this shift in design education paradigm to occur, the primary audience – professional designers and design educators – must embrace this change in thinking and consciously work towards shaping the new paradigm. Both groups will play an important role in the transition from today's standards to tomorrow's view of the design profession. This shift in paradigm will go a long way in changing how designers are viewed by their clients, government regulators, peers in collateral organizations and the general populace - to be viewed with greater credibility by these collateral groups. With more environment-behavior research being conducted and used, the more designers will be associated with other professions whose practices are based on the results and findings of empirically based research.

If higher education is the place where the form of EBR needs to be relevant, then it is suggested here that higher education should place a higher value on where EBR researchers disseminate their work. It can be said that publishing for other researchers is the fast track to success in academia. While that is certainly prevalent in many academic disciplines, it remains a monumental impediment when researchers in academia opt to disseminate their findings in an applied manner to practitioners rather than in the more

familiar academic theoretical milieu for other researchers in the design disciplines. A shift in the academic paradigm has the potential to contribute to a more responsive professional use of EBR as well as elevate how the design profession is viewed by its constituents; such as, clients, peers in collateral organizations, government regulators, and even the general public. And it is argued here that two components in the system could benefit from a closer examination.

The body of theoretical and applied literature has grown considerably in EBR since 1973; still, there does not seem to be a corresponding evolution in its use - as confirmed by research findings from Schmidt (1984), Merrill (1973), 2002 AIAS Task Force Report, Karpan (2005), this study and others. As part of the paradigm shift, environment-behavior researchers need to take their research findings to the architects. Simultaneously, if researchers actually go to architectural conferences and AIA sponsored workshops they, and their research, need to be recognized for this scholarship at a level commensurate with other academic disciplines. But, what does this mean, what would it look like, and how do we make it happen? It means change is needed. Change in how design is taught. Change in how research is conducted, presented and rewarded. Change in how the design profession and design educators think about EBR and its use in the design process.

What would it look like? The change begins with a shift in the academic paradigm. Design educators need to teach, do research, and mentor students – undergraduate as well as graduate students. In a fast pace, constantly changing, global society and given the current economic conditions, it is insufficient to merely teach or to

only conduct research. More emphasis needs to be put on teaching problem solving, which allow designers to build on their knowledge base and apply their abilities to a more comprehensive number of applications. Design education needs to focus more on how to conduct research that is less esoteric and more applied. In the course of teaching how to conduct research, students would learn how to find and use research by others. And design educators need to make the research component relevant. Research should be undertaken that focuses on real-world problems. Architects, government regulators, peer organizations, and clients can provide these real world research opportunities – creating ample opportunities for conducting useful applied research. Environment-behavior researchers should embrace collaborative opportunities with other disciplines and seek peer review of their work through professional journals, professional societies, government agencies, professional conferences and workshops. Researchers should seek patents and copyrights on new and significant research discovered.

The design profession needs to change how they think about EBR use and how it can benefit the profession and their clients. They need to become a *willing* partner with design educators and environment-behavior researchers. Relevant research should be an area of focus at AIA conferences and workshops as well as at those also held by peer organizations. More internships focusing on real world environment-behavior issues should be offered to undergraduate and graduate students. The design profession along with industry can acknowledge EBR contributions by granting awards, of varying significance, to researchers; ranging from Young Investigator awards to Lifetime Achievement awards.

How can this happen? It can happen by embracing the need for change and proactively working towards the needed changes. If architects, designers and educators do not embrace and take the lead in facilitating this paradigm shift, the status quo will continue.

Lessons Learned and Directions for Future Research

When reviewing the findings from the current study, it became clear how much insight is gained at the end, or when almost at the conclusion of a project. One goal of this research was to construct an index of receptivity across the three conceptually linked constructs – awareness, communication, and propensity – believing that these three issues are relevant to gaining an increased understanding of EBR use. Results from such an index could have been used as an exploratory tool. By reducing a large body of data to a few meaningful summary measures, one could then identify key features and any interesting patterns in the data. This in turn could have helped generate hypotheses of interest as well as determining, more clearly, designer attitudes or views on the use of EBR.

However, in order to create a valid index, a much larger sample was required. Because of the constraints of the study – mostly time, accessibility to additional AIA member email addresses, and limited responses by members surveyed – it was not possible to obtain sufficient data to construct such an index. The same can be said for the 1973 and 1984 studies - the sampling sizes were insufficient to allow for the construction of an index by Merrill (1973) and Schmidt (1984), hence, were not part of their projects. It could easily be argued that the profession continues to be driven primarily by what has

worked in the past and is not particularly receptive to the potential benefits of EBR, especially if it means leaving the profession's comfort zone.

However, it can be said, when comparing responses to the awareness, communication, and propensity survey items from all three studies, one can still conclude that architects and designers are more aware of EBR -- but still do not use it.

In retrospect, a greater number of AIA member email addresses could have been solicited in order to survey a larger representation of the designer population yielding a potentially more robust statistical understanding of the relationships among the research variables. The greater breadth of data collected for each survey item and survey section would have allowed for more in-depth data analyses; one such analysis would have been an index of receptivity.

REFERENCES

Alexander, C. (1964). *Notes on the Synthesis of Form*. Cambridge: Harvard University Press.

Association of Collegiate Schools of Architecture (2010). From acsa.org, under heading: Membership-School Membership-*Full Members*. Retrieved from: https://www.acsa-arch.org/membership/

American Institute of Architecture Mission Statement and Covenants. (n.d.) AIA.org. Originally retrieved fall 2008, from AIA.org Web site: http://aia.org/aiaucmp/groups/aia/documents/pdf/aias078156.pdf

American Institute of Architecture Students (2002). AIAS Studio Culture Task Force Report: *The Redesign of Studio Culture*. Copyright 2002 American Institute of Architecture Students, Inc. Retrieved from: http://www.aiasnatl.org

Anthony, K. & Grant, B. (1993). *Gender and Multiculturalism in Architectural Education*. Journal of Architectural Education 47(1), 2.

Barker, Roger G. (1968). *Ecological Psychology*. Stanford: Stanford University Press.

Bechtel, R.B. (1997). *Environment & Behavior: An Introduction*. California: Sage Publications.

Boyer, E. & Mitgang, L. (1996). *Building Community: A New Future for Architectural Education and Practice*. Princeton, N.J.: The Carnegie Foundation for the Advancement of Teaching.

Cantril, H. (1966). The Human Design. In S. Kaplan & R. Kaplan (Eds.). *Humanscape: Environments for People* (pp. 94-102).

Churchill, W. (October 28, 1943). WinstonChurchill.org. Retrieved August 4, 2010, from WinstonChurchill.org Web site: http://www.winstonchurchill.org/learn/speeches/quotations

Deasy, C. M. (August 1973). People Patterns in the Blueprints. *Human Behavior*, 2(8), 8-15.

Deasy, C. M. (1974). *Design for Human Affairs*. New York: John Wiley.

Dickson, A.W., & White, A.C. (1993). Are We Speaking the Same Language?

Practitioners' Perceptions of Research and the State of the Profession. *Journal of Interior Design*, 19(1), 3-10.

Dutton, T. (1991). The Hidden Curriculum and the Design Studio. *Voices in Architectural Education*. New York: Bergin & Garvey.

Farber, S. M. (1966). Quality of Living – Stress and Creativity. In S. Kaplan & R. Kaplan (Eds.). *Humanscape: Environments for People* (pp. 109-110).

Fisher, Thomas R. (2000). *In the Scheme of Things: Alternative Thinking on the Practice of Architecture*. Minneapolis: University of Minnesota Press.

Friedman, Thomas L. (2006). *The World is Flat 3.0*. New York: Picador.

Gans, Herbert J. (1968). *People and Plans*, New York: Basic Books, Inc.

Groat, L. & Wang, D. (2002). Architectural Research Methods, New York: Wiley & Sons, Inc.

Gutman, Robert (1972). The Questions Architects Ask, *People and Buildings*, New York: Basic Books, Inc.

Hillier, Musgrove, & O'Sullivan (1972). *Knowledge and Design*, in Environmental Design: Research and Practice, 2(3), 2.

Kaplan, S. & Kaplan, R., (Eds.), (1982). *Humanscape: Environments for People.* Ann Arbor, Michigan: Ulrich's Books, Inc.

Karpan, C.M. (2005). *A Theoretical Framework for Research in Interior Design: Implications for Post-Secondary Interior Design Education in Canada and the United States*. Unpublished doctoral thesis. Manitoba, B.C., Canada: University of Manitoba. Lawson, Bryan (1990). *How Designers Think*. London: The Architectural Press.

Korobkin, B. (1975). *Images for Design: Communicating Social Science to Architects*. Washington DC: American Institute of Architects, p. 2.

Lawson, B. (1990). *How Designers Think*, 2nd ed. Cambridge: University Press.

Lawton, M. P. & Nahemow, L. (1973). Ecology and the Aging Process, from C. Eisdorfer and M.P. Lawton, *Psychology of Adult Development and Aging*. Washington, D.C.: American Psychological Association.

Lewin, K. (1936). *Principles of Topological Psychology*. New York: McGraw Hill.

Lewis, C.A. (1975). Nature City. In S. Kaplan & R. Kaplan (Eds.). *Humanscape: Environments for People* (pp. 448-453). Ann Arbor, Michigan: Ulrich's Books, Inc.

Lipman, A. (June 1969). The Architectural Belief System and Social Behavior, *The British Journal of Sociology*.
McCue, G. M., Ewald, W.R. & The Midwest Research Institute (1970). A Report of the American Institute of Architects. *Creating the Human Environment*. Urbana: University of Illinois Press.

Merrill, J. L. (1976). *Factors Influencing the Use of Behavioral Research in Design*. Unpublished doctoral dissertation. Ann Arbor: The University of Michigan.

Nickerson, R. (2003). *Psychology and Environmental Change*. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Oliver, J.M.L. (2005). *Environmental Analysis of Pathology Laboratory Patient Service Centers: A Pattern Language Approach*. Unpublished masters thesis. Columbia: The University of Missouri.

Rice University (2008). School of Architecture. Originally retrieved fall 2008, from Rice University Web site: http://arch.rice.edu/modules/indexwin.php

Royal Institute of British Architects (RIBA) Research Committee (May 1970). *Strategies for Architectural Research*. Architectural Research and Teaching, p. 4.

Schmidt, F.J. (1984). *The Preferences of Practicing Architects for the Communication of Environment Behavior Research Information in Design*. Unpublished master's thesis. Manhattan: Kansas State University.

Seidel, Andrew D. (1980). *Factors Influencing Conceptions of Information Quality in the Production and Utilization of Environment and Behavior Research*. Buffalo, New York: State University of New York at Buffalo, School of Architecture and Environmental Design, Monographs.

Seidel, Andrew D. (1981). *Teaching Environment and Behavior: Have We Reached the Design Studio?* Journal of Architectural Education, 24 (3), 8-13.

Schön, Donald (1983). *The Reflective Practitioner: How Professionals Think in Action*. New York: Basic Books, Inc.

Sullivan, L. (1896). The Tall Office Building Artistically Considered. In R. Twombly (Ed.), *Louis Sullivan: The Public Papers* (pp.103-105). Chicago: The University of Chicago Press.

University of Oregon (2008). School of Architecture & Applied Arts, About A&AA. Originally retrieved fall 2008, from University of Oregon Web site: http://aaa.uoregon.edu/info

UT-Austin (2008). School of Architecture, Studio Culture, Background. Originally retrieved fall 2008, from UT-Austin Web site: http://soa.utexas.edu/architecture/culture

Wright, F.L. (1898). Frank Lloyd Wright Foundation. (n.d.) FrankLloydWright.org. Retrieved July 2010, from FrankLloydWright.org Web site Biography section, third paragraph titled *The Chicago Years*: http://www.franklloydwright.org/fllwf_web_091104/Biography.html

Wotton, Sir Henry (1624). *The Elements of Architecture*. A Facsimile Reprint of the First Edition (London, 1624) with Introduction and Notes by Frederick Hard. Published for The Folger Shakespeare Library, Charlottesville: The University Press of Virginia.

Zeisel, John (1975). Sociology and Architectural Design. *Social Science Frontiers*. New York: Russell Sage Foundation.

Zeisel, John (2006). *Inquiry By Design*. New York: W.W. Norton & Company, Inc.

APPENDIX A

Cover Letter

Dear Colleague:
Attached please find a survey which is being conducted through the Department of Architectural Studies at the University of Missouri to determine how behavioral research findings may better meet the needs of architects and designers.

Your name was randomly selected from the membership roles of the American Institute of Architects (AIA). Because we are contacting only a small number of architects, your response is particularly important. You can be assured of the complete confidentiality of your responses. Establishing a functional relationship between behavioral research and architectural practice is a growing concern in the profession. In order to do so, it is important that the researcher understand what types of information the architect needs. It is only from architects like yourself that this information can be obtained.

Whether you have used behavioral research or not your responses will greatly aid in developing better research products and programs for the benefit of the design profession.
Please take 10 minutes to complete the following survey. I ensure that your participation in this research is voluntary and completely confidential. Clearly, the entire survey with all of its items completed is most useful and preferred. However, you have the option to skip any question or quit participating at any point in time. You will not be penalized for the decision you make. Your responses will in no way be linked to your name or contact information, and all data will be presented in aggregate form.

By completing this survey, you ensure that you are at least 18 years of age.

Please respond by October 6, 2008. Your response can be emailed to: wamplerjs@missouri.edu or faxed to: 573.884.4948.

If you have questions, concerns or complaints about this research, please contact Susan Wampler (wamplerjs@missouri.edu) or Dr. Ronald Phillips (phillipsr@missouri.edu). You can learn more about your participation, and your rights as a human research subject at: http://research.missouri.edu/cirb/index.htm, or contact the University of Missouri Campus Institutional Review Board at 573.882.9585.

Thank your for your time and valuable in put.

Sincerely,

Ronald Phillips, ArchD   Susan Wampler, BS
MU Department of Architectural Studies   Project Director

INTRODUCTION This survey is about the uses architects and interior designers make of environment - behavior research (EBR) and how such research can make their work more relevant per their clients need(s). By behavioral research we mean the work of architects, interior designers, landscape architects, sociologists, psychologist and others who study how the characteristics of the physical environment affect human behavior and attitudes.
Try to answer the questions on the basis of your first reading. Any comments you wish to add will be helpful and appreciated. Please respond to each item.

1 The items listed below include ideas, books, organizations and people that are associated in some way with the field of environment – behavior research. Indicate your level of familiarity with each by circling or marking an "X" over the number most closely associated with your level of familiarity.

Not Very   Very
Familiar   Familiar

1	2	3	4	5	a) EDRA (Environmental Design Research Association)
1	2	3	4	5	b) *A Pattern Language*
1	2	3	4	5	c) behavior based design programming
1	2	3	4	5	d) CM Deasy
1	2	3	4	5	e) barrier free design
1	2	3	4	5	f) Kevin Lynch
1	2	3	4	5	g) behavior based post occupancy evaluations
1	2	3	4	5	h) John Zeisel
1	2	3	4	5	i) design for the elderly
1	2	3	4	5	j) AIA Research Corporation
1	2	3	4	5	k) Leon Pastalan
1	2	3	4	5	l) architectural legibility and wayfinding
1	2	3	4	5	m) *The World is Flat*

1	2	3	4	5	n) Christopher Alexander
1	2	3	4	5	o) behavioral issues in school design
1	2	3	4	5	p) Caudill Rowlett Scott
1	2	3	4	5	q) *Progressive Architecture* research awards
1	2	3	4	5	r) Edward Hall
1	2	3	4	5	s) behavioral issues in public housing design
1	2	3	4	5	t) Clare Cooper Marcus
1	2	3	4	5	u) behavioral issues in health care design
1	2	3	4	5	v) Ezra Eherencrantz
1	2	3	4	5	w) *Personal Space*
1	2	3	4	5	x) Henry Sanoff
1	2	3	4	5	y) Coolfont Model
1	2	3	4	5	z) Oscar Newman

2 The following tasks are generally considered to be among the important goals of architecture. **Please rank them in order of their importance to you** with "1" indicating the most important and "4" least important.

_____ a) Creating environments that match the needs of the people who use them.

_____ b) Creating more efficient buildings through innovative technology.

_____ c) Translating information in to physical forms.

_____ d) Creating appropriate visual forms.

3 Circle or mark an "X" over the number that best describes **how often you use each of the following** in obtaining information about the people for whom you design.

Not At   Strongly
  All   Agree

1	2	3	4	5	a) Your own experience and training.
1	2	3	4	5	b) Information provided by the client.
1	2	3	4	5	c) Observing and talking with potential users.
1	2	3	4	5	d) Studying similar projects.
1	2	3	4	5	e) A behavioral specialist on your own staff.
1	2	3	4	5	f) A behavioral consultant.
1	2	3	4	5	g) Reading material on user behavior and attitudes.

4 Listed below are some statements about environment-behavior research and design. **Circle or mark an "X" over the number that best indicates the degree to which you agree with each of the following statements.**

Strongly   Strongly
Disagree   Agree

1	2	3	4	5	a) The form in which behavioral research findings are presented is overly wordy and full of jargon.
1	2	3	4	5	b) Government codes and regulations allow the architect / designer the latitude to apply behavioral research findings.
1	2	3	4	5	c) There are already too many things of at least as great importance as behavioral research for the architect / designer to consider.
1	2	3	4	5	d) Behavioral research is of marginal importance since the architect / designer can generally do an adequate job when interpreting user needs for himself.

1	2	3	4	5

e) Clients do not understand the point of using behavioral research.

1	2	3	4	5

f) Behavioral research costs too much considering what it has to offer.

1	2	3	4	5

g) Behavioral information is readily available to the architect / designer.

1	2	3	4	5

h) There should be more emphasis on behavioral factors during architectural / design education.

5 There have been many proposals for increasing the communication of environment-behavior research information to architects / designers. Some proposed communication methods are listed below. **Indicate your level of preference for each item** by circling or marking an "X" over the appropriate number. Please respond to each item.

Not Very
Preferable

Very
Preferable

1	2	3	4	5

a) Hiring an employee to specifically act as "in-house" EBR translator.

1	2	3	4	5

b) Public or privately funded EBR service agency, providing consulting and information dissemination on an "as need" basis.

1	2	3	4	5

c) Professional behavioral consultants subcontracted for specific projects.

1	2	3	4	5

d) Changes in architectural / designer training with increased emphasis on design for behavioral factors.

1	2	3	4	5

e) Continuing education programs for practicing architects / designers; such as short courses, workshops and conferences.

1	2	3	4	5

f) EBR information published in architectural / designer journals.

1	2	3	4	5

g) EBR information in a new journal written specifically for architects / designers, not for researchers.

1	2	3	4	5	

h) AIA and IDA handbooks, supplements and contract documents dealing with EBR use in design.

1	2	3	4	5	

i) Design guide books with EBR information organized by building type.

1	2	3	4	5	

j) Computer access to EBR information retrieval system.

6 Circle or mark an "X" over the number that best indicates **how important you think each of the possible uses of behavioral research listed below is** to the architect / designer.

Not Important				Very Important

1	2	3	4	5	

a) Provide support for hunches.

1	2	3	4	5	

b) Provide evidence with which to convince clients.

1	2	3	4	5	

c) Spark new ideas.

1	2	3	4	5	

d) Prevent possible errors in programming.

1	2	3	4	5	

e) Provide an advantage in competing for work.

1	2	3	4	5	

f) Help define and describe user groups.

Background Information

_____ Age

_____ Gender

Professional Training: Degree _____ Year _____ School _____

Degree _____ Year _____ School _____

Degree _____ Year _____ School _____

Years in professional practice _____

Current Position: Principal _____ Associate ____ Employee _____

              Other _____

Rank the primary area(s) of professional specialization in accordance with the proportion of your professional effort for which the following account; "1" should go beside the activity taking the greatest part of your effort with "2" as the next greatest part of your effort and so on. Use "0" if it does not apply:

_____ Research (not project related)

_____ Programming

_____ Design

_____ Production / Supervision

_____ Client contact

_____ Other (specify)_____

Number of design professionals in firm _____

Type of organizational setting:

_____ Private professional architectural practice / design firm

_____ Public agency

_____ Commercial / Manufacturing

_____ Educational / Teaching

Type(s) of projects undertaken by firm:

_____

_____

_____

_____

Email your completed survey to: wamplerjs@missouri.edu or fax to: 573.884.4948

By October 6, 2008

Thank you for your valuable in put!

KSU
KANSAS
STATE
UNIVERSITY

Department of Architecture

College of Architecture and Design
Seaton Hall
Manhattan, Kansas 66506
913-532-5953

June 20, 1983

Dear Colleague:

This survey is being conducted through the Department of Architecture at Kansas State University, as part of a study designed to determine how behavioral research may better meet the needs of architects.

Establishing a functional relationship between behavioral research and architectural practice is a growing concern in our profession. In order to do so, it is important that the researcher understand what types of information the architect needs. It is only from registered architects like yourself that this information can be obtained.

Your name was randomly selected from the membership roles of the American Institute of Architects. Since we are contacting only a small number of architects, your response is particularly important. You can be assured of the complete confidentiality of your responses.

Whether you have employed behavioral research or not your responses will greatly aid in the development of better research products and programs, for the benefit of the architectural profession. Would you please take a few minutes to complete the enclosed questionnaire and return it to us at your earliest convenience? A postage-paid return envelope has been provided for your convenience.

Thank you for your kind cooperation.

Sincerely,

Eugene Kremer, AIA
Head, Department of Architecture

Frederick J. Schmidt
Project Director

ck

INTRODUCTION

This survey is about the uses architects make of environment-behavior research (EBR) and how such research can be made more relevant to their work. By environment-behavior research we mean the work of architects, psychologists, sociologists and others who study how characteristics of the physical environment affect human behavior and attitudes.

Try to answer the questions on the basis of your first reading. Any comments you wish to add will be greatly appreciated. Please respond to each item and return the completed questionnaire in the enclosed postage paid envelope.

1 The items listed in this section include ideas, books, organizations and people that are associated in some way with the field of environment-behavior research. Indicate your level of familiarity with each item by marking the appropriate boxes on the left. Please respond to each item.

NOT VERY
FAMILIAR

VERY
FAMILIAR

1	2	3	4	5		
1	2	3	4	5	A)	ecological psychology
1	2	3	4	5	B)	Christopher Alexander
1	2	3	4	5	C)	E.D.R.A. (Environmental Design Research Association)
1	2	3	4	5	D)	C. M. Deasy
1	2	3	4	5	E)	A.I.A. Research Corporation
1	2	3	4	5	F)	Progressive Architecture Research Awards
1	2	3	4	5	G)	Clare Cooper Marcus
1	2	3	4	5	H)	barrier free design
1	2	3	4	5	I)	Coolfont Model
1	2	3	4	5	J)	Edward Hall
1	2	3	4	5	K)	Personal Space
1	2	3	4	5	L)	behavior based design programming
1	2	3	4	5	M)	Leon Pastalan
1	2	3	4	5	N)	design for the elderly
1	2	3	4	5	O)	Oscar Newman
1	2	3	4	5	P)	behavioral issues in school design
1	2	3	4	5	Q)	Kevin Lynch
1	2	3	4	5	R)	behavior based post occupancy evaluations
1	2	3	4	5	S)	architectural legibility and wayfinding
1	2	3	4	5	T)	Henry Sanoff
1	2	3	4	5	U)	Caudill Rowlett Scott
1	2	3	4	5	V)	behavioral issues in public housing design
1	2	3	4	5	W)	A Pattern Language
1	2	3	4	5	X)	John Zeisel
1	2	3	4	5	Y)	Ezra Eherencrantz
1	2	3	4	5	Z)	behavioral issues in health care design

Appendix B

2 Listed in this section is a sampling of actual research findings available for one population group: The elderly. Similar information is available for other groups. Assume for a moment that you are writing an architectural design program for a retirement housing project and mark the box at the left of each statement that best indicates how useful you think the information would be to you in such a task.

NOT VERY USEFUL ... VERY USEFUL

1	2	3	4	5		
[1]	[2]	[3]	[4]	[5]	A)	As hearing and vision decline, the older person depends increasingly on his sense of touch.
[1]	[2]	[3]	[4]	[5]	B)	A lounge should be provided adjacent to dining areas to allow for socializing while awaiting meals.
[1]	[2]	[3]	[4]	[5]	C)	Older persons dislike larger, open spaces.
[1]	[2]	[3]	[4]	[5]	D)	Limitations in health, skills and other resources leave a person more vulnerable to environmental constraints.
[1]	[2]	[3]	[4]	[5]	E)	A standup garden built waist high and with access to all points from the perimeter worked well in one retirement home.
[1]	[2]	[3]	[4]	[5]	F)	An optimal life space for the aged should allow the person to select his own combination of privacy and involvement with social groups.
[1]	[2]	[3]	[4]	[5]	G)	It is recommended that walks designed for the elderly have resting places no more than 150 feet apart.
[1]	[2]	[3]	[4]	[5]	H)	Efficiency apartments are undesirable for the elderly because they often create confusion about the functions of spaces.
[1]	[2]	[3]	[4]	[5]	I)	In one retirement home a small lounge crowded with furniture was just as popular as one 5 times larger with more space between furnishings.
[1]	[2]	[3]	[4]	[5]	J)	Since a person can respond only to those aspects of the environment experienced through his senses, age-related sensory losses affect very real changes in the world in which the elderly live.
[1]	[2]	[3]	[4]	[5]	K)	Older persons find great satisfaction in observing the activity outside their quarters. To this end low window sills and unobstructed views are desirable.
[1]	[2]	[3]	[4]	[5]	L)	Colors tend to appear faded to the older person, particularly cool shades of blue and green.
[1]	[2]	[3]	[4]	[5]	M)	Providing easy access to activities and services and encouraging friendships are important means of prolonging an older person's independence.
[1]	[2]	[3]	[4]	[5]	N)	It is more difficult for an older person to locate and identify sounds, for example to tell if a sound comes from a few feet away or from down the hall.
[1]	[2]	[3]	[4]	[5]	O)	The physical environment can be compared to a language in that it offers a system of cues to tell a person how to respond in a particular situation.
[1]	[2]	[3]	[4]	[5]	P)	The elderly reduce their attention to the environment because the previously automatic movements of eating and walking need to be watched.

113

Appendix B

3 Listed here are some statements about environment-behavior research and design. Mark the box which best indicates the degree to which you agree with each of the following statements.

STRONGLY DISAGREE [1] [2] [3] [4] [5] STRONGLY AGREE

A) The form in which behavioral research findings are presented is overly wordy and full of jargon.

[1] [2] [3] [4] [5]   B) Government codes and regulations allow the designer the latitude to apply behavioral research findings.

[1] [2] [3] [4] [5]   C) There are already too many things of at least as great importance as behavioral research for the designer to consider.

[1] [2] [3] [4] [5]   D) Behavioral research is of marginal importance since the designer can generally do an adequate job if interpreting user needs for himself.

[1] [2] [3] [4] [5]   E) Clients see the point of using behavioral research.

[1] [2] [3] [4] [5]   F) Behavioral research costs too much considering what it has to offer.

[1] [2] [3] [4] [5]   G) Behavioral information is readily available to the architect.

[1] [2] [3] [4] [5]   H) There should be more emphasis on behavioral factors during architectural education.

4 There have been many proposals for increasing the communication of environment-behavior research (EBR) information to designers. Some proposed communication methods are listed below. Indicate your level of preference for each item by marking the appropriate box. Please respond to each item.

NOT VERY PREFERABLE [1] [2] [3] [4] [5] VERY PREFERABLE

A) Hiring new, specifically trained employees to act as "in-house" EBR translators.

[1] [2] [3] [4] [5]   B) Public or privately funded EBR service agency, providing spot consulting and information dissemination.

[1] [2] [3] [4] [5]   C) Professional behavioral consultants, subcontracted for specific projects.

[1] [2] [3] [4] [5]   D) Changes in architectural school training with increased emphasis on design for behavioral factors.

[1] [2] [3] [4] [5]   E) Continuing education programs for practicing architects, such as short courses, workshops, and conferences.

[1] [2] [3] [4] [5]   F) EBR information published in architectural journals.

[1] [2] [3] [4] [5]   G) EBR information in a new journal written specifically for architects, not researchers.

[1] [2] [3] [4] [5]   H) A.I.A. handbooks, supplements and contract documents dealing with EBR use in design.

[1] [2] [3] [4] [5]   I) Design guide books with EBR information organized by building type.

[1] [2] [3] [4] [5]   J) Computer access to EBR information retrieval system.

114

5 Please fill in the following background information.

1) Age _____

2) Gender _____

3) Professional Training: Degree _____ Year _____ School _____
                          Degree _____ Year _____ School _____

4) Years in professional practice _____

5) Position: Principal _____ Associate _____ Employee _____ Other _____

6) Primary area of professional specialization (check one):
   _____ Research (not project related)
   _____ Programming
   _____ Design
   _____ Production/Supervision
   _____ Client contact
   _____ Other

7) Number of design professionals in firm _____

8) Type of organizational setting:
   _____ Private professional architectural practice
   _____ Public agency
   _____ Commercial/Manufacturing
   _____ Educational/Teaching

9) Type(s) of projects undertaken by firm: _____
   _____
   _____

Please return this questionnaire in the envelope provided as soon as possible.
Thank you.

Gerontological Society

Suite 520 • One Dupont Circle, Washington D. C. 20036 • 202 659-4698

November 15, 1973

As Gerontological Society Director of Architecture and Environment, I have been working closely with John Merrill of the Department of Architecture, University of Michigan, to determine how behavioral research can be made more _useful_ to designers.

One of the Society's major approaches toward the improvement of the housing and the environmental condition of this nation's elderly (and all age groups for that matter) is through the application of research findings to the design process.

Since you have exhibited an interest in this area, I am asking you to assist us by providing the necessary feedback as to how you use behavioral information and how you feel it can be made more appropriate. Your input will greatly aid us in the development of more relevant future material and programs for the benefit of the design profession.

Please take a few minutes to complete the enclosed questionnaire and mail it to John at your earliest convenience.

Sincerely,

THOMAS O. BYERTS, M Arch
Director of Architecture and
   Environment

ANN ARBOR, MICHIGAN 48104
TEL. 313 764-1300   17 1 2129

November 9, 1973

Dear

This survey is part of a study to determine how research from psychology
and sociology can be brought to bear on problems of architectural and
planning practice. A growing number of researchers are focusing their
attention on the effects of the physical environment on man's behavior.
One of their goals is to contribute to improving the quality of the
architectural environment. In order for them to do so it is important
that they understand the needs of the designer who is to use their findings.

It is only from practicing architects like yourself that we can obtain
information on these needs. We would be most appreciative if you would
assist us by completing the enclosed questionnaire. Since we are contacting
only a small number of architects in this first stage of the study your
response is particularly important.

As you may already know the Research Committee of the American Institute of
Architects is concerned with establishing a functional relationship between
behavioral science research and architectural practice. Our findings will
be made available to them.

Thank you,

John L. Merrill
Project Director

INTRODUCTION
This survey is about the uses architects and planners make
of behavioral research and how such research can be made more relevant to their work.
By behavioral research we mean the work of architects, sociologists, psychologists and
others who study how characteristics of the physical environment affect human behavior
and attitudes.

TRY TO ANSWER THE QUESTIONS OFF THE CUFF, on the basis of your first read-
ing. Any comments you wish to add will be appreciated. Whether you complete the
questionnaire or not please return it to us with your comments in the enclosed envelope.

1 The information in the statements below is a sampling of research findings available
to designers for one population group: the elderly. Similar information is available
for other groups. ASSUME FOR A MOMENT THAT YOU ARE DOING THE DESIGN
PROGRAM FOR A RETIREMENT HOUSING PROJECT, CIRCLE THE NUMBER AT THE
LEFT OF EACH STATEMENT THAT BEST INDICATES HOW USEFUL YOU THINK THE
INFORMATION WOULD BE TO YOU IN SUCH A TASK.

The statements are all based on actual research. Nevertheless, you may disagree
with the information and so find the statement not useful. You may also consider a
statement not useful because it is too general, too specific, only common sense, or has no
apparent connection to design.

Not useful ▼   Very useful ▼

1 2 3 4 5 6   a) As vision and hearing decline the older person depends in-
creasingly on his sense of touch.

1 2 3 4 5 6   b) A lounge should be provided adjacent to dining areas to
allow for socializing while awaiting meals.

1 2 3 4 5 6   c) Older persons dislike larger, open spaces.

1 2 3 4 5 6   d) Limitations in health, skills and other resources leave a
person more vulnerable to environmental constraints.

1 2 3 4 5 6   e) A standup garden built waist high and with access to all
points from the perimeter worked well in one retirement home.

1 2 3 4 5 6   f) An optimal life space for the aged should allow the person
to select his own combination of privacy and involvement with
social groups.

118

1 2 3 4 5 6   g) It is recommended that walks designed for the elderly have resting places no more than 150 feet apart.

1 2 3 4 5 6   h) Efficiency apartments are undesirable for the elderly because they often create confusion about the functions of spaces.

1 2 3 4 5 6   i) In one retirement home a small lounge crowded with furniture was just as popular as one 5 times larger with more space between furnishings.

1 2 3 4 5 6   j) Since a person can respond only to those aspects of the environment experienced through his senses, age-related sensory losses affect very real changes in the world in which the elderly live.

1 2 3 4 5 6   k) Older persons find great satisfaction in observing the activity outside their quarters. To this end low window sills and unobstructed views are desirable.

1 2 3 4 5 6   l) Colors tend to appear faded to the older person, particularly cool shades of blue and green.

1 2 3 4 5 6   m) Providing easy access to activities and services and encouraging friendships are important means of prolonging an older person's independence.

1 2 3 4 5 6   n) It is more difficult for the older person to locate and identify sounds, for example to tell if a sound comes from a few feet away or from down the hall.

1 2 3 4 5 6   o) The physical environment can be compared to a language in that it offers a system of cues to tell a person how to respond in a particular situation.

1 2 3 4 5 6   p) The elderly reduce their attention to the environment because the previously automatic movements of eating and walking need to be watched.

2 CIRCLE THE NUMBER that best indicates the amount of experience you have had with design and planning problems for special groups such as the elderly or mentally handicapped.

Very little ▶ 1 2 3 4 5 6 ◀ A great deal

With which groups have you had the most experience? _____

3 The following tasks are generally considered to be among the important goals of architecture. PLEASE RANK THEM IN ORDER OF THEIR IMPORTANCE TO YOU with "1" indicating the most important, . . "4" least important.

_____ a) Creating appropriate visual forms.

_____ b) Translating information into physical forms.

_____ c) Creating more efficient buildings through innovative technology.

_____ d) Creating environments that match the needs of the people who use them.

4 CIRCLE THE NUMBER THAT BEST DESCRIBES HOW OFTEN YOU USE EACH OF THE FOLLOWING IN OBTAINING INFORMATION ABOUT THE PEOPLE FOR WHOM YOU DESIGN.

Not at all ➤   Very often ➤

1	2	3	4	5	6	a) Your own experience and training.
1	2	3	4	5	6	b) Information provided by the client.
1	2	3	4	5	6	c) Observing and talking with potential users.
1	2	3	4	5	6	d) Studying similar projects.
1	2	3	4	5	6	e) A behavioral specialist on your own staff.
1	2	3	4	5	6	f) A behavioral consultant.
1	2	3	4	5	6	g) Reading material on user behavior and attitudes.

5 CIRCLE THE NUMBER WHICH BEST INDICATES THE DEGREE TO WHICH YOU AGREE WITH EACH OF THE FOLLOWING STATEMENTS.

Strongly disagree ➤   Strongly agree ➤

1 2 3 4 5 6   a) The form in which behavioral research findings are presented is overly wordy and full of jargon.

1 2 3 4 5 6   b) There are already too many things of at least as great importance as behavioral research for the designer to consider.

1 2 3 4 5 6   c) Behavioral research is of marginal importance since the designer can generally do an adequate job of interpreting user needs for himself.

1 2 3 4 5 6   d) Government codes and regulations do not allow the designer the latitude to apply research findings.

1 2 3 4 5 6   e) Clients do not see the point in using behavioral research.

1 2 3 4 5 6   f) Behavioral information is not readily available to the arch-
itect.

1 2 3 4 5 6   g) Behavioral research costs too much considering what it has
to offer.

1 2 3 4 5 6   h) There should be more emphasis on behavioral factors during
architectural education.

6 CIRCLE THE NUMBER THAT BEST INDICATES HOW IMPORTANT YOU THINK
EACH OF THE POSSIBLE USES OF BEHAVIORAL RESEARCH LISTED BELOW IS
TO THE DESIGNER.

Not
important

Very
important

1 2 3 4 5 6   a) Provide support for hunches.
1 2 3 4 5 6   b) Provide evidence with which to convince clients.
1 2 3 4 5 6   c) Spark new ideas.
1 2 3 4 5 5   d) Prevent mistakes in programming.
1 2 3 4 5 6   e) Provide an advantage in competing for work.
1 2 3 4 5 6   f) Help define and describe user groups.

BACKGROUND INFORMATION

Number of years practicing architecture: _____

Professional training: { Degree _____ Year _____ School _____

Degree _____ Year _____ School _____

Position: ___ Owner/principal ___ Associate ___ Designer ___ Other _____

Rank the following in accordance with the proportion of your professional effort for
which they account. "1" Should go beside the activity taking the greatest part of your
effort.

_____ Programming   ___ Production/supervision

_____ Research - not project related   ___ Client contact

___ Design   ___ Other _____

Number of design professionals in firm: _____

Types of projects with which firm deals: _____