FINITE RESOURCES: EXPLORING DESIGNER'S COMMUNICATION AND DISSEMINATION PREFERENCES DURING DESIGN RESEARCH

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ABSTRACT

The value of research to design is increasingly apparent. Strategic processes of design thinking (Lockwood, 2009) and Evidence-based design (EBD) strategies have increased the call for empirical evidence as antecedents to design decision making. While evidence suggest American interior designers by and large value research (Birdsong & Lawlor 2001; Dickinson, et al., 2012); their good intentions might be stymied by impending deadlines, client demands, or shear information overload. To effectively communicate findings, researchers should seek understanding of what motivates research efforts and why designers might abandon those efforts. Using constructs of Dual Processing Theory (Evans, 2003; Stanovich & West, 2000;) and motivational orientation (Deci, Koesterner, & Ryan, 1999); this study explores American interior designers who both do and do not conduct design research, and their reasons for these decisions. Data was analysed through descriptive statistics (e.g. percentages, frequencies) and *Chi-*square testing. Open-ended responses were inductively coded and quantified. Evidence suggests of those who do not conduct design research, many would do so, if not for time constraints. Further, both groups stated intrinsic and extrinsic motivations for conducting design research. Implications from this study may help design researchers to better communicate their findings by having foreknowledge of how designers might value their research efforts.

Keywords: design research, motivation, interior design

1 INTRODUCTION

Strategic processes of design thinking (Lockwood, 2009) and Evidence-based design (EBD) strategies (Nussbaumer, 2009) have increased the demand for usable empirical evidence as an antecedent to design decision making. Many American design firms (Cannon Design, 2013; Gensler, 2014, Perkins & Will, 2013) and contract furniture manufacturers (Herman Miller, 2013, Knoll, 2013, Steelcase, 2013) are engaging internal scholars to generate their own proprietary research. However, an understanding of how designer's internalize research findings and apply information in project problem solving remains elusive. While, evidence suggest designers by and large value research (Birdsong & Lawlor 2001; Dickinson, et al., 2012); their good intentions might be overshadowed by impending deadlines, client demands, or shear information overload. To effectively communicate findings, researchers should build an understanding of what motivates research efforts and why they might abandon those efforts. This study explores American interior designers who both do and do not conduct design research, and their reasons for doing so.

2 LITERATURE

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There are several precedent studies which have examined American interior designer's perception of research, and resulting evidence does suggest practitioner's increasingly value research efforts. Dickinson, Anthony, and Marsden's (2012) survey of design practitioners indicated 93% agreed that undergraduate students should know how to use research in the designs of their projects. The same study found younger, more educated designers who practiced in commercially orientated firms were significantly more likely to value research. In an earlier survey of interior designers' perceptions relative to *professionalism*, Birdsong and Lawlor (2001) found 64.9% of their sample felt research was an important component of the design profession; in fact, no one in their sample indicated research as *not important.* However, this valence placed on research within interior design is a relatively recent phenomena; in Dickson and White's (1993) survey, only 34% of the sample indicated they researched a design problem 100% of the time, and another 27% indicated they researched a design problem less than 25% of the time. These studies suggest how research manifests in the interior design process likely depends on the size, scope, and specific needs of the project, or perhaps due to the individual's specific motivations for conducting research. While, the value of research in design is likely to continue increasing, there remain many differences in how research is approached.

2.1 TYPES AND LEVELS OF RESEARCH.

Previous studies have indicated that interior design practitioner's research paradigms are largely pragmatic, with little focus on the expansion of knowledge (Dickson & White, 1993). As such, definitions of design research vary greatly (Dickinson et al., 2012; Dickinson et al., 2007; Groat & Wang, 2009). Some interior designers may strictly utilize existing research (i.e. gathering information), while others may conduct inquiries intended to generate new knowledge (i.e. creating information). Hamilton and Watkins (2009) delineated four levels of increasing rigor in design-based research methodologies.

1. Level 1- reviewing literature and connecting findings to projects;
2. Level 2-defining a hypothesis and measuring outcomes;
3. Level 3-sharing what was learned; and
4. Level 4- submitting outcomes to peer review.

Relative to interior design, Phares'(2011) survey asked American healthcare designers if they *usually* conducted design research according to the aforementioned levels, 79% reported Level 1, 68% Level 2, 29% Level 3, while only 12% indicated they conducted research in accordance to Level 4. Traditionally practitioner research has been directly to a project at hand. Dickson & White's (1993) survey showed that practitioners generally conducted research that reviewed the technical aspects of design (88%), drew on traditional and past experiences (84%), examined workflow processes (77%), or productivity requirements (80%). This may indicate that while practitioners are apt to use research in their design process, their methods are aimed at direct application to projects; thus, may likely be extrinsically motivated to conduct research efforts.

However, contemporary cross-disciplinary paradigms have increased the value placed on more rigorous design research efforts. The popularization of the Design Thinking movement (Brown, 2009; Dohr & Portillo, 2011, Dorst 2011, Lockwood, 2009) has provided designers with an approachable, yet systematic methodology in data collection. Additionally, Evidence-Based Design (EBD)

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(Hamilton & Watkins, 2009; Nussbaumer, 2009) strategies have increased demand for useable empirical evidence as precursors to design decision-making (Bosch & Nanda, 2011; Cama, 2009).

As a result of new communication platforms and changing research paradigms; today there are numerous information sources available. In addition to research produced at universities, large design firms (Cannon Design, 2013; Gensler, 2014, Perkins & Will, 2013) and contract furniture manufacturers (Herman Miller, 2013, Knoll, 2013, Steelcase, 2013) are engaging internal scholars to generate research. Their findings are often disseminated through graphic white papers, presentations, and at trade shows. Additionally, American professional organizations (IIDA Knowledge Network, AIA Knowledge Net, ASID Knowledge Center) and strategic partnerships (InformeDesign) have attempted to enhance practitioner's connection to academic findings by providing directories hosting concise descriptions of empirical studies. However, the extent to which these are currently used by designers is unclear.

In his seminal writing, Cross (2001) called for a rigorous understanding of *designerly ways of knowing* (p. 49). Studies of the design process have focused on idea generation (Dorst, 1995; Lawson, 2005), antecedents to the creative process (Amabile, 1996; Csikszentmihalyi, 1996), and the dichotomy between systematic and heuristic processes (Daalhuizen, Person, & Gattol, 2013). Subsequently emphasis has been placed on researching the synthesis tasks of design, resulting in multiple frameworks relative to ideation. However, far less is known about tasks performed and value placed within analysis and evaluation phases of design; including knowledge on the strategies interior designers may employ while conducting research and their motivations for doing so.

Cognitive science has helped to illustrate information processing preferences. Empirically-based models assume that individuals want to form accurate beliefs, and use one of two systems to reach those conclusions. These models include Dual Process Theories (Evans, 2003, Stanovich & West, 2000), which suggest individuals use two forms of processing information; System 1 and 2. System 1 is gut-level processing which relies on intuitive associations requiring little mental effort (e.g. heuristics); while, System 2 is cognitive level processing which is more deliberate, systematic, and requires the use of central working memory (Evans, 2003). The System and individual employs is largely situational and including the individual's background knowledge and desired level of precision (Chaiken 1980, 1987, Chaiken, Gener-Sorolla & Chen, 1996), and the individual's desire to maintain beliefs that are compatible with current interests (Lord, Ross, & Lepper, 1979, Ditto & Lopez, 1992) or their social goals (Chaiken et al., 1996). Suggesting the value individual's place on efforts can impact how they process information.

As such, an examination of value for design research would be incomplete without understanding constructs of motivation. Parallels can be drawn between research activities and learning, and educational psychology has gleaned evidence regarding the many complex facets of motivation relative to learning. Empirical evidence suggests attaining efficacy is a product of one's perception of *value* and *possibility of success* (Ambrose, Bridges, DiPietro, Lovett, Norman, & Mayer, 2010). Research expanding and refining our understanding of human motivation has greatly increased in the last century. Motivational orientation in terms of extrinsic and intrinsic influences is important to distinguish. Early work such as Skinner's (1953) experiments, were rooted in operant conditioning

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systems; where behaviour was viewed as being modifiable using environmental reinforcements (e.g. incentive systems or punitive actions). Later studies suggested that while operant conditioning methods can increase short-term extrinsic motivation; this motivation typically diminishes once the incentive has been obtained (Amabile, 1993; Deci, Koesterner, & Ryan, 1999). Further, higher levels of intrinsic motivation for discovered problems over those that were predetermined were noted by Csikszentmihalyi (1996), and for learning-oriented individuals (Button, Mathieu, & Zajac, 1996). Additionally, studies have illustrated the detrimental effects of external motivators (Amabile, 1982, 1987), but the issue of whether reward helps or hinders output remains controversial in across many domains.

While designers often cannot determine the scale, scope, and schedule of their projects; their learning orientation and motivations can impact their choice of whether or not to conduct research, and if they value these efforts. Additionally if stymied by communication impediments on processing preferences, designers may de-value research efforts.

3 METHODS

This study utilized an online survey questionnaire (e.g., Qualtrics) for data collection. The survey was sent to members of the American Society of Interior Designers, as this organization is the largest professional design association in the United States, and represents practitioners from both residential and commercial market sectors. The survey took less than 20 minutes to complete, and gathered demographic information as well as research activities. The following definition was used for research; "the identification of important design questions and the development and use of organized problem-solving methods" (Asher Thompson, 1992 p. 47). While more contemporary definitions of design research have been offered, this was used by the researcher as it was rooted in interior design, and inclusive of both information gathering and information creation approaches to research. This was important as previously noted, definitions of design research vary amongst interior designs (Dickinson et. al, 2007) and prior research indicated interior designers do not typically associate research with new discovery (Dickinson et. al, 2012). If participants indicated they did not conduct project related research they were asked reasons why, and if they would prefer to do so. Those that indicated they did conduct research answered questions about those research activities. Survey items were both quantitative and qualitative and several items allowed for open-ended responses to expand upon answers.

4 LIMITATIONS & SAMPLING

As with any exploratory research design, this study has its own limitations that should be acknowledged. These include: lack of a previously tested survey instrument, and limited internal consistency testing. However, to minimize possibility for error, this instrument was reviewed by two distinguished researchers, a statistical consultant, American Society of Interior Designers' Director of Market Research, and subsequently pilot-tested by three discrete sets of either design practitioners or design researchers.

The researcher sought to establish content, predictive, and construct validity (Creswell, 2009, p 149) through the writing of the questions and subsequent series of pilot tests and revisions. Additionally, when appropriate, questions

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allowed for both closed and open-ended responses to test for predictive validity and several items retested the same research question. However, to maintain brevity, not all questions were retested. Pilot responses by the practitioner group allowed for establishing predictive validity by examining responses against previously published research findings where possible, and comparing their responses to known information about their research practices. Following final revisions to the instrument, construct validity was verified through a final crosscheck of the instrument with the research questions.

Following testing of the survey instrument, a recruitment email was sent to a random sample of 6,849 Associate, Allied, and Professional members. These membership types assume that the participant has obtained compulsory educational requirements and/or work experience to qualify for these membership types; thus, helping the researcher to better target practicing designers actively engaged in design projects. The invitation email included a link to the survey. After the initial email was sent to the selected sample two email reminders were sent if no response was received. The only identifier to each completed questionnaire was an IP address, unless participants opted to share their email addresses for a follow-up interview.

5 PARTICIPANT CHARACTERISTICS

Three hundred and sixty-six ASID members responded to the survey (5.3% response rate). Fifty-nine percent of participants were over 51 and 63% percent of respondents had over 10 years of professional design experience. Forty-seven percent reported that they were principals/owners of their firm, and consequently 47% indicated they worked in a sole proprietorship. Participants were primarily residential designers 67%. Most respondents held a design-related Bachelor's degree 51%, and another 19% had advanced degrees. Table 1 provides a summary of demographic information of the survey respondents.

5.1 TABLE. 1 DEMOGRAPHIC INFORMATION

BACKGROUND	FREQUENCY	PERCENTAGE
Current age (n=358)		
20-30 years	57	16%
31-50 years	93	26%
51-65 years	163	46%
Over 65 years	45	13%
Years of experience (n=358)		
Less than 2	35	10%
2-5	43	12%
6-10	54	15%
11-20	68	19%
Over 20	158	44%
Current position (n=358)		
Junior Designer/Architect	26	7%
Interior Designer/Architect	105	29%
Senior Designer/Architect	38	11%
Design Director	7	2%
Project Manager	7	2%
Principal/Owner	143	40%
Other	32	9%

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Size of firm (n=350)		
Sole Proprietorship	164	47%
2-5 Designers	124	35%
6-20 Designers	40	11%
21-50 Designers	11	3%
51-200 Designers	6	2%
Over 200 Designers	5	1%
Primary Market Sector (n=356)		
Commercial/Corporate Interiors	58	16%
Health & Wellness	15	4%
Residential	237	67%
Retail/Hospitality	15	4%
Education	10	3%
Other	21	6%
Level of Education (n=352)		
No degree	11	3%
Certificate	14	4%
Associates Degree (non-design)	1	0%
Associates Degree	35	10%
Bachelor's Degree (non-design)	46	13%
Bachelor's Degree	179	51%
Master's Degree (non-design)	14	4%
Master's Degree	47	13%
Ph.D. (non design)	2	1%
Ph.D.	3	1%

Following demographic inquiries, participants were asked questions regarding their current research practices. Eighty-nine percent of respondents indicated they conducted design research in accordance with the aforementioned Asher Thompson definition.

In order to determine if there was any association between demographic variables to whether or not research was conducted, cross tabulation analysis with *Chi*-square statistics were used. As indicated by Table 2, there were no significant associations, suggesting that research tasks were conducted similarly across the varying cohorts.

5.2 TABLE 2. ASSOCIATIONS BETWEEN RESEARCH ACTIVITIES.

CONDUCTING OF PROJECT RELATED RESEARCH	*CHI*-SQUARE	p-value
Age	.17	.98
Firm Size	1.97	.85
Education	2.42	.99
Market Sector	2.24	.82
Years of Experience	1.90	.75
Current Title	5.23	.51

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5.3 PARTICIPANTS WHO DO NOT CONDUCT RESEARCH

As previously mentioned 11% of the sample indicated they did not conduct project related research. As such, reasons for this avoidance are worth exploring. As indicated on Table 3, issues relative to the value placed on research-either by client or themselves-was frequently attributed.

5.4 TABLE 3. ASSOCIATIONS BETWEEN RESEARCH ACTIVITIES.

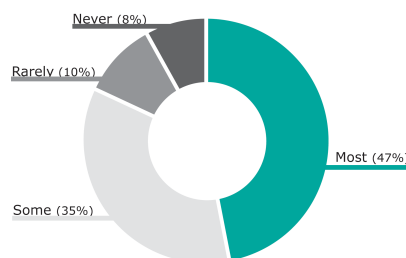| REASONS FOR NOT CONDUCTING RESEARCH	FREQUENCY
Time pressures	15
I don't see value in research for my current projects	14
My client's do not see the value for it	4
My client's will not pay for these services	4
Other *Not applicable to my current position*	5

However, if given more time 64% of those respondents indicated they would conduct research. When asked why key reasons include:

— Improved design practice or design outcomes (intrinsic/extrinsic motivation),
— To build understanding or increase knowledge (intrinsic motivation),
— Increase possibilities (intrinsic motivation),
— Maintain currency (intrinsic motivation),
— For new discovery (intrinsic motivation),
— To publish (extrinsic motivation),
— To add credibility (extrinsic motivation), and
— For marketing purposes (extrinsic motivation).

These responses align with intrinsic and extrinsic motivations, as noted above.

5.5 PARTICIPANTS WHO DO CONDUCT RESEARCH

To understand how value is placed on research for those who reported they did conduct project research, the survey asked respondents how much of their research time they billed to respective clients. Most billed their time directly to their client. While this is not a conclusive measurement of intrinsic or extrinsic value, it does suggest that designers generally feel their clients will value their

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research energies; thus, were comfortable in billing for these efforts.

Figure 1 –Billing of research efforts.

When examining what types of research activities practitioners conducted, most utilized pragmatic approaches allowing for the application of knowledge directly to a project at hand (i.e. gathering relevant information).

5.6 TABLE 4 – TYPES OF RESEARCH CONDUCTED.

GATHERING INFORMATION	FREQUENCY	CREATING INFORMATION	FREQUENCY
Client research *Examining a client's business plan, strategic goals and/or lifestyles to inform programming*	191		
		Interviews/Focus Groups *Meeting with key stakeholders to better understand project requirements*	129
		Ethnographic Observation *Observing patterns, preferences, workflows, etc. of a client or end-user while within their current space*	95
Precedent studies *Systematic analysis of previous projects*	51		
Human Behaviour & Theory *Exploring relevant psychological, behavioural, or sociological phenomena*	95		
Business/Lifestyle Trends *Exploring broad topics that may influence your designs*	151		
Design trends *Understanding what is being done on other projects by competitors*	206		
Sustainability Issues *Exploring improved outcomes, methods, or product specifications with a goal of sustainable outcomes*	147		
Product Research/Prototyping *Reading product literature, building or fabricating mockups for a project*	190		
Post Occupancy Evaluations *Formalized research regarding project success and failures after project move in*			84
Other *Visual research* *Color* *Aging in Place*	8		
Total	**1039** (77%)		**308**

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			(23%)

5.7 OPEN ENDED RESPONSES.

Upon coding open ended responses relative to information processing preferences, evidence suggest that System 1 processes are used to initially evaluate sources of information (i.e. determine its value) After value was established, respondents did cite the use of analytical systems to ascertain information. When those who conduct design research were asked what other ideas they may have in terms of sharing research, participants at times offered suggestion relative to communication and processing:

> For most designers the heavier on images [sic] the better we will retain most information. I find that 85% to 90% of designers learn more easily and retain more information from visual information.

Others took the opportunity to reinforce the value they place on design research aligning with extrinsic motivations.

> The more you can educate a client, the better off you make them look - and that's really why they hired you.

Others offered statements that would indicate are apt to conduct research based on intrinsic motivations.

> I'm constantly "in the hunt" for information that I can use to provide better service to my clients and stay up on the trends in design and lighting.

6 DISCUSSION

This study confirms earlier findings, while providing new insights relative to American interior design practitioner's values in terms of design research. However, more research needs to be conducted. Dickson & White's (1993) findings relative to pragmatic approaches is supported by this study. Responses suggest this is due to factors including time pressures, or the perceived value of research efforts.

As discussed earlier, this sample represents primarily experienced, residential designers. Existing literature would lead one to believe that even higher percentage would have indicated they conducted research had the representative sample been comprised of younger and more commercially oriented designers, in accordance to Dickinson et al.'s (2012) findings. Further, anecdotal evidence may suggest experienced designers may feel less likely to value research due to their relatively high pre-existing levels of domain knowledge. However, *Chi*-square testing suggested no significant relationships between the tested variables and whether or not they conducted project research.

Open ended responses by both practitioners who conduct research and those who do not, but would like to, indicate both intrinsic and extrinsic drivers. Some attributed research to the generation of knowledge and building of understanding (intrinsic), while others indicated they would use it to add credibility or market themselves (extrinsic). When determining value of discrete

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information sources, open ended responses indicated a preference toward visual and concise bits of information.

This study, while exploratory in nature, begins to develop discussions surrounding what designer's value about research and their motivations in pursuing research efforts. Implications from this study may be important to researchers interested in sharing findings with design practitioners, in order to be better armed with foreknowledge relative to what designer's value, and thus better reach their intended audience.

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