

# **Strategies for Research in Healthcare Settings: Challenges and Opportunities**

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# EXECUTIVE SUMMARY OF PAPERS

## 1. Ann Sloan Devlin

*Ann Sloan Devlin is the May Buckley Sadowski '19 professor emerita of psychology at Connecticut College and EDRA 2020 Career Award recipient. Her current areas of research include the role of architecture in health-care outcomes, perceived control as a mediator of stress in health-care settings, and perceptions of therapists' offices.*

The first paper in this compendium examines how the small laboratory experiment can be used as a platform on which to base larger field experiments and studies. Measured on any dimension, field research in healthcare environments is expensive. Before moving into the field, small, tightly controlled experimental research can provide evidence about which healthcare design interventions may be advantageous for healthcare outcomes, setting the stage to test the interventions in situ. Drawing on a body of research dealing with inpatient and outpatient settings, this paper by Ann S. Devlin emphasizes the benefits and drawbacks in three areas: research design, approaches to use of visual stimuli, and participants in online studies. In 1966, Rachel Kaplan, a methodological pioneer, published an article in the EDRA Proceedings focusing on what can be learned from small experiments. This paper returns to the small experiment to focus on the benefits (and challenges) of doing laboratory work with implications for real world applications in healthcare.

## 2. Rebecca Davis & Margaret Calkins

*Rebecca Davis is a Professor at Grand Valley State University, Kirkhof College of Nursing in Grand Rapids, MI. Through grants from the National Institutes on Aging and the John A. Hartford Foundation, she conducts research on purposeful environmental design to improve wayfinding and overall functioning for older adults with cognitive impairment.*

*Dr. Calkins is internationally recognized as a creative, dynamic leader, trainer and researcher in the field of environments for elders. She is Board Chair of IDEAS Institute, an independent research institute dedicated to exploring the therapeutic potential of the environment--social and organizational as well as physical--particularly as it relates to frail and impaired older adults.*

In the second paper, Rebecca Davis and Margaret Calkins tackle the challenges of measuring the impact of environmental features on wayfinding. Specifically, the work of their Wayfinding Study Team focuses on methods to develop a wayfinding intervention for older adults in long-term care settings. With an emphasis on the importance of environmental cues, specifically signage and landmarks, they explain their approach to testing methods first in the laboratory through virtual reality and then extending their work to the field. The paper discusses the advantages and disadvantages of such VR testing and the design of their current work evaluating the interventions in the field in a randomized controlled study. The paper further explains the challenges of measuring environmental complexity, a critical feature in wayfinding.

### 3. Kara Freihoefer & Renae Rich

*Kara Freihoefer, PhD, is the Director of Research at HGA Architects and Engineers where she focuses on building a research-driven practice to better inform and educate clients and colleagues on the human impact of design decisions. In 2021, Kara was recognized as Healthcare Design magazine's researcher of the year as part of the HCD10 class.*

*Renae Rich, as the Occupant Evaluation Manager at HGA, oversees a program within the Design Insight Group to build HGA's reputation for research and measured results through the systematic evaluation of design projects in terms of occupant experience and satisfaction across all our market sectors.*

In the third paper, Freihoefer and Rich from HGA Architects and Engineers argue that firms and their clients will benefit by prioritizing occupancy evaluations as a strategic initiative. The emphasis on occupancy evaluation has the potential to differentiate the firm as a "curious, research-driven organization," reflecting its use of data, evidence, and ultimately original insights to inform design. The paper looks at the history of occupancy evaluation (formerly post-occupancy evaluation) and the value of such research strategies to improving design. The authors highlight the numerous challenges to incorporating occupancy evaluation as a component of design, given that such research is not viewed as part of the normal design process. The authors present an argument that occupancy evaluation can range from the simple (e.g., building walk-through) to the multi-faceted (e.g., triangulated multi-method approach) and include a range of data gathering approaches (subjective, objective, retrospective, and prospective). The paper demonstrates how to make clear the value of occupancy evaluation to both firms and clients.

### 4. Saif Haq

*Dr. Saif Haq is an award-winning researcher, educator, administrator, and design professional. He is the founder-director of the Design for Health program at Texas Tech University and a board member of 'Architecture Research Centers Consortium'. At EDRA he is the co-founder of EDRAMOVE.*

One of the techniques mentioned in a number of papers in the compendium is space syntax, a technique that allows researchers to measure environmental properties arising from the connections of a given space to every other space in the same layout. Saif Haq's paper explains space syntax in an understandable way and identifies the five fundamental decisions a researcher must make in a methodological approach to space syntax. Starting with the theoretical concepts that underly space syntax, he moves to how space syntax is used as a methodology of measurement. The paper uses numerous figures to illustrate the principles being discussed. Concepts include unit spaces, axial lines, the spatial system, accessibility, visibility, closeness, and betweenness. The paper explains how space syntax captures a synchronous model of movement through space, which is an asynchronous experience.

## 5. Matthew Browning & Fu Li

*Matthew Browning* is the Virtual Reality & Nature Lab Director and Associate Professor in the Department of Parks, Recreation and Tourism Management at Clemson University. His research examines the effects of physical and simulated environments on human health. His Lab's mission is to strengthen the frequency and richness of human-nature interactions.

*Fu Li* is a Ph.D. student in the Department of Parks, Recreation and Tourism Management at Clemson University. His research interests include topics in Environmental Perception, Behavior Studies, and Landscape & Urban Planning. He is the former Senior Research Associate in the College of Architecture and Landscape Architecture, Peking University.

The paper by Browning and Li presents strategies for studying human health through the use of virtual nature. Including a summary of the systematic reviews available on VR as they relate to restorative environments, the paper reviews what is now known about the impact on human users of exposure to nature imagery and the kinds of dependent variables that are used (e.g., subjective assessments such as mood; objective indices such as blood pressure or alpha waves). The authors discuss the sources of content for VR studies (e.g., professional photographs, drone capture, gaming engines) and examine the gaps in the literature and important directions for future research, including five methodological implications (e.g., developing better recruitment methods).

## 6. Nicholas Watkins, April Spivack, Kyle Sellers & Anita Grabowska

As Gensler's Health Sector Research Lead, *Nicholas Watkins*, PhD, seeks out hidden dimensions of humane settings. The work focuses on the interactions between humans and their built environments that reflect excellence in design and contribute to health wellness and well-being. He has served as an EDRA board member and Chair.

*April J. Spivack* is an Associate Professor of Entrepreneurship, Management, & Organisation at Hanken School of Economics. Her research uses quantitative and qualitative methods to examine first-person experiences, the interplay of context and person, and creativity and well-being outcomes for entrepreneurs and other organizational members.

*Kyle Sellers* works in design research, exploring an array of issues related to urban planning, commercial real estate, workplace dynamics, and healthcare. He holds a Master's Degree from the Johns Hopkins University, and he is currently pursuing a Master's of Science in Population Health Informatics from the City University of New York.

*Anita Grabowska* is a research strategist for Gensler, who specializes in people-centric research to understand the human experience, with expertise in quantitative and qualitative methodologies. She holds a Master's Degree from the University of Virginia.

The paper by Watkins, Spivack, Sellers, and Grabowska from Gensler moves us from examples that deal with relatively small samples to a discussion of a nationwide study of a US sample of over 3500 outpatients. Because the authors argue that the choice of the panel provider to obtain participants is the

most important step in the research process, they examine the criteria for that selection in depth. A useful aspect of this examination is to evaluate such possibilities as Amazon Mechanical Turk and Kantar Profiles. A second focus of the paper is the issue of questionnaire development and administration and how the quality of data submitted by participants can be improved, especially given the problem of professional survey takers who may not be attentive to the questions being asked in the survey. The paper concludes with an explanation of their outpatient experience index project (O-EXI) and the particular type of analysis (fuzzy set qualitative comparative analysis) that was used (and why).

## 7. Lorissa MacAllister

*Dr. Lorissa MacAllister is a researcher, architect, founder, and President of Enviah a consulting company in healthcare that uses a pioneering approach to aligning operations and building environments around an organizational strategy for success. Her work applies research to practice and revolves around using the environment to improve occupants' experiences.*

In Lorissa MacAllister's paper, she tackles the complex idea of brand value and how it can be defined and quantified. She discusses the ways in which qualitative research can be used to document the patient's experience as a series of encounters with healthcare professionals and the healthcare environment itself. Relying on a framework provided by Kahneman, the paper helps the reader understand that the patient's healthcare journey is comprised of a series of peak moments of encounter, such as when a nurse enters the patient's room. The compilation of these peak moments in turn creates a perspective about the quality of care the patient experienced. Research can help to document which encounters deserve more attention in building brand value.

## 8. Ellen Taylor

*Ellen Taylor is the Vice President for Research at The Center for Health Design. She has a BArch from Cornell University, Global Executive MBAs from Columbia University and London Business School, and a PhD from Loughborough University in England. She was recognized as the HCD10 Researcher in 2017.*

The final paper -- the values of secondary research -- essentially provides a bookend to the first paper on tightly controlled laboratory research. This paper by Taylor on the role of secondary research in helping the practitioner speaks to the realities of time pressures in the design field and what we can expect practitioners to digest, given the point Taylor makes that "rigorous research is being published at a rate that no one can realistically follow." The paper is laid out to present a challenge, such as "Time Searching" with a matched opportunity, in this case "Summarizing Evidence." There are five such challenge-opportunity sections in the paper, and in illustrating the solutions or opportunities, Taylor makes use of various tools developed by the Center for Health Design, such as the interactive design diagrams available on the Center website. The paper contextualizes secondary research in a way that challenges its connotation for academics as a shortcut of questionable value; readers will come away appreciating the ways in which secondary research provides opportunities for not only healthcare designers and practitioners, but for academics as well.