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# Introduction

Over the past decade there have been occasional suggestions that the term “design” is worn out from overuse by writers who snatched onto a trend without really understanding its meaning or dynamic and now want to move on to another trend, which they also do not understand. The term is no longer suitable/ acceptable/ desirable/ persuasive/ relevant/ attractive for general use. It may be too dangerous or threatening, requiring too much thought or explanation for the wider audiences that are now involved in the work of design, whether as makers or consumers. It may not fit the current trend of popular conversation in this year or that year of business publications or academic programs or social programs. The term should be discarded or disguised or hidden from view, avoided in company names, book titles, journal articles and on business cards in favor of terms that are less challenging or difficult to understand, in favor of terms that are more vague and euphemistic. Readers may make a list [ here ].

For the design community, however, there is less ambivalence about the term. Popular trends may come and go, but the core of design remains in the mind and imagination—and in the discipline of professional practice. This takes us to *Design Issues*, whose goal is to provide a forum for the discussion of the role of design in contemporary life, involving, as it must for deeper understanding, the interplay of history, theory and criticism as well as the pluralistic interplay of contrasting perspectives and approaches among those who practice design as well as those who study it. This goal is evident in the selection of articles for this edition of the journal. They address a wide range of issues that demonstrate not the decline of a term but its growing significance and maturity as a key concept of cultural life.

One of the terms often substituted for design without careful thought is “innovation.” In the first article of this edition, however, Mike Hobday, Anne Boddington, and Andrew Grantham explore the relationship of design and innovation, offering an “innovation studies” perspective on design. As they explain, this is part of “a broader question of where design could be positioned within the social sciences as the subject expands across an increasingly wide range of business and social activity.” This is the first of a two-part series in which they provide valuable definitions of key terms and show how innovation papers have, indeed, revealed the central importance of design in business innovation. In the second part of this series, to be published in the next issue of the journal, they examine “the emerging field of design thinking” in relation to innovation studies.

The next article, “The Design Stance in User-System Interaction,” addresses the issue of how users interact with designed systems. In addition to discussing situated interactions and the humane approach of treating people as active, intelligent human beings and not simply passive elements in complex systems, the author, Nathan Crilly, addresses the issue of sophisticated users who have the capacity to recognize that designed systems have been designed. He develops the idea of a “design stance,” a term coined by philosopher Daniel Dennett. This is a novel approach to interaction design that suggests a subtle and complex relationship between designer and user in situations where the designer has been more like the Cheshire cat, invisible but for his smile.

From the user’s recognition of the designer in the system, we move to “The ‘Designer’—the 11th Plague”: Design Discourse from Consumer Activism to Environmentalism in 1960s Norway.” The central theme of this historical study by Kjetil Fallan is the transformation of critical design discourse in Norway in the 1960s, where Victor Papanek’s concern for “design for the real world” became part of a broader effort to move design “out of its comfort zone” in postwar Scandinavian work. It is a move from consumer activism toward environmentalism, pointing toward, in the words of novelist Dag Solstad, a change in modernity “from aesthetics to politics.”

The origins of design in craft, where the designer and maker are one and the same person, are echoed in the contemporary world, where craft continues to take a variety of forms of practice ranging from crafting of software to shaping objects of everyday needs and rituals. In “Subtle Technology: The Design Innovation of Indian Artisanship,” Ken Botnick and Ira Raja suggest this as a point of departure: “Looking closely at craft-driven cultures still alive in the world can provide remarkable insights into contemporary problem-solving. For models of sustainability and economy, nothing could improve on the working methods of the craftsman, sourcing his materials locally, wasting nothing, delivering custom goods made to order—again, locally.” This is the beginning of a discussion of craft in Indian culture and of several themes that cross between design and craft. The goal of their study is to challenge what they call the hierarchy separating professional design from craftsmanship as well as the opposition that privileges individual identity above undifferentiated communal identity.

In “Gestalt and Graphic Design: An Exploration of the Humanistic and Therapeutic Effects of Visual Organization,” Julia Moszkowicz questions the overall assessment of the effect of Gestalt theory on the discipline of graphic design. Recognizing the connection of Gestalt psychology and the origins of graphic design in the twentieth century, she challenges a tendency in later interpretations, including postmodernist writing, to view the connection in negative terms. She argues that the negative view comes from a reductive view of Gestalt theory, shaped around the isolated study of abstract

form. Instead, she counters “the negative impressions of Gestalt theory with detailed historical work, revisiting the primary texts of its early proponents and highlighting its development into a recognized therapy. At a time when graphic design is engaging actively with notions of interactivity and audience participation, Gestalt theory offers productive ways of thinking about possible structures for orchestrating positive human experiences.” This suggests a useful reassessment of the nature and role of the Gestalt approach in design.

In the next article, “Indigenous Knowledge and Respectful Design: An Evidence-Based Approach,” Norman W. Sheehan introduces a theme that some in design have considered only at a distance, the theme of indigenous knowledge and indigenous knowledge systems. Indigenous knowledge is defined variously as knowledge that is unique to a given culture or society or an information base that facilitates communication and decision-making in local circumstances. It is regarded as dynamic and constantly influenced by experimentation and creativity at the local level, contrasting with external or universal knowledge systems generated through institutions such as universities. Sheehan, an Aboriginal designer, educator, and researcher, introduces the concept of indigenous knowledge as an ontological concept because it situates inquiry “within an intelligent and intelligible world of natural systems, replete with relational patterns for being in the world.” With echoes of the dialectical method of physicist and philosopher David Bohm, he explains that indigenous knowledge understandings “arise in partnership with these existent and sustaining patterns of relation.” The goal of the paper is to promote a more socially responsible and environmentally engaged vision for design. One of the features of the approach that is explored in the paper is the concept of “respectful design.” For Sheehan, respect “is based on this ancestral understanding that we all stand for a short time in a world that lived long before us and will live for others long after we have passed.” In turn, respectful design “is founded on how design positions itself in relation to natural systems and the social world.” Sheehan discusses different aspects of this concept and gives special attention to the process of conversation or discussion that grounds design in a local community and also to the importance of “visual dialogue.” At first, this article may seem remote in its references and applications, grounded as they are in Aboriginal culture in Australia. As reading unfolds, however, one may well begin to understand how closely connected this approach is to some emerging ideas about participatory design and co-designing, related to the design of systems and environments grounded in community—sometimes in this journal called fourth order design.

The final article is Per Galle’s “Foundational and Instrumental Design Theory.” The author focuses on the relationship between these two approaches to design theory and then, based on that

relationship, moves on to explore more closely the nature of foundational design theory. The initial step is to consider three works in design literature, classic works by Herbert Simon and Donald Schön and then Klaus Krippendorff's more recent book. Though none of these authors employ the theme of foundational and instrumental, as Galle acknowledges, he seeks to compare the works in the light of that distinction. Following a useful and insightful discussion of these works, the author then discusses the features of a "good" foundational theory of design. This discussion includes insights into the nature of a possible convergence of definitions in such a theory. This essay is a meaningful contribution to investigations of the theory of design, and the discussion of important works by design theorists is, in itself, a contribution that should encourage others to engage in further treatment of important texts in the field.

Following the articles in this edition, we have a review by Kipum Lee of a recent service design conference held in Boston in October 2010 and organized by the Service Design Network. This review is valuable for its contextualization of service design as well as for its assessment of the recent conference held in Boston. It is clear that service design is an emerging practice, and one that stands in need of more theory and reflection. Lee provides an extensive review of previous conferences in this area held in Europe and the United States. He identifies key concepts as well as the evolving themes of practice and theory.

We are also pleased to offer several book reviews that will interest many readers. Nathaniel Boyd and Jack Henrie Fisher review *Uncorporate Identity*, Metahaven by Daniel van der Velden. Kjetil Fallan reviews *Design and Truth* by Robert Grudin. Brian Donnelly reviews *Unimark International: The Design of Business and the Business of Design* by Jan Conradi. Jesse O'Neill comparatively and in combination reviews *The Transformer: Principles of Making Isotype Charts* by Marie Neurath and Robin Kinross and *From Hieroglyphics to Isotype: A Visual Autobiography* by Otto Neurath, edited by Matthew Eve and Christopher Burke. Laura Forlano reviews *A Fine Line: How Design Strategies are Shaping the Future of Business* by Hartmut Esslinger. Finally, Erik Stolterman reviews *Vibrant Matter: A Political Ecology of Things* by Jane Bennett.

Bruce Brown  
Richard Buchanan  
Dennis Doordan  
Victor Margolin

In the *Design Issues* Introduction of the Spring 2011 issue, the editors made a mistake in the pronoun usage when referring to Ashley Hall. We regret the mistake and apologize sincerely for it.

# An Innovation Perspective on Design: Part 1

Mike Hobday, Anne Boddington,  
Andrew Grantham

## Introduction

This paper analyzes innovation and design from a management and economic perspective. The management sciences, innovation studies, economics, and the social sciences in general have, traditionally, paid little attention to design as a core creative industrial and economic activity. This situation is now changing as innovation and management studies increasingly recognize the technical and wider role of design in business and economic activity. Within the social sciences, including management studies, one might think that one of the natural “homes” of design research and teaching would be innovation studies—a well-established subject area that focuses on the role of research and development (R&D), engineering, science, and technology in the economy. However, with the exception of a stream of important product development and design management research, this expectation is not fulfilled.<sup>1</sup> As this paper makes clear, within mainstream innovation studies, design has been largely absent from theory, teaching, textbooks, and research.

The purpose of this paper is therefore to provide an “innovation studies” perspective on design, focusing on design in business and the economy. This approach can be seen as part of a broader question of where design could be positioned within the social sciences as the subject expands across an increasingly wide range of business and social activity. Design potentially might thrive in many areas within the social sciences, including strategy, entrepreneurship, and marketing in the business management area, as well as in sociological, organizational science, and economic fields.

In this paper we argue that by developing an innovation perspective on design, and a design perspective on innovation, both fields stand to gain. The idea of the paper is to critically examine the role of design in business and the economy from an innovation viewpoint. First, we provide definitions and perspectives on the terms, “design” and “innovation,” helping to define the boundary conditions of both subjects. Second, we assess the treatment of design in innovation studies. More often than not, design is either treated in passing or entirely overlooked. This section also asks why this neglect happens, given the recognized importance of design in innovation. Finally, we assess the design discourse from an innovation and social science perspective, showing how design

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1 The classic product development studies include K. B. Clark, “The Interaction of Design Hierarchies and Market Concepts in Technological Evolution,” *Research Policy*, 14:5 (1985), 235–51; K. Ulrich, “The Role of Product Architecture in the Manufacturing Firm,” *Research Policy*, 24:3 (1995), 419–40; and C. Y. Baldwin, and K. B. Clark, *Design Rules, Vol. 1: The Power of Modularity* (Cambridge, MA: MIT Press, 2000). Design management texts include, for example, R. Cooper, and M. Press, *The Design Agenda: a Guide to Successful Design Management* (Chichester: John Wiley and Sons, 1995); and M. Bruce and J. Bessant, *Design in Business: Strategic Innovation Through Design* (Essex: Pearson Education, 2002). Also see two recent practice-oriented teaching textbooks on design management and strategy K. Best, *Design Management: Managing Design Strategy, Process and Implementation* (Lausanne: AVA/Academia Publishing SA 2006); B. von Stamm, *Managing Innovation, Design and Creativity* (Chichester, John Wiley and Sons, 2008). These are discussed in Part 2 of this article (forthcoming).

as a human-centered, core creative activity in business challenges the overly scientific, rational view of the firm and many of the standard intervention tools of innovation management. Part 2 of this paper (in an upcoming issue of *Design Issues*) builds on this analysis to illustrate the gains that can be achieved by bringing the fields of innovation studies and design/design thinking closer together.

### Definitions and Perspectives

Clearly defining the terms “design” and “innovation” is important for achieving the purposes of this paper, as well as for establishing the boundary conditions of the paper. Neither term is unproblematic, and both have changed over time. In innovation studies, innovation has traditionally been defined as the successful introduction of a new or improved product, process, or service to the world or marketplace.<sup>2</sup> However, this definition does not capture the incremental innovations that can lead to large gains in productivity and product quality. These innovations are often a major source of structural change and economic growth.<sup>3</sup> In developing countries, and sometimes in advanced nations, incremental innovation tends to occur from “behind the technology frontier,” defined by leading firms in the advanced countries and usually measured by the ratio of R&D to sales. Therefore, following Nelson and Rosenberg and Schmookler, we define innovation as a product, process, or service new to the firm—and not just new to the world or marketplace.<sup>4</sup> This broader definition encompasses the stream of minor innovations that follow from radical new products and processes. Thus, innovation is not only a product but also a *process*—one that involves the lengthy development and application of new knowledge and skills, rather than being an easily identifiable event. In this paper, we stick mainly to this “Schumpeterian” definition. However, it should be noted that, in recent times, the definition is often reduced and simplified into “the application of a new idea to create value.” Sometimes, the term is broadened beyond technological innovation to include organizational innovation<sup>5</sup>—because the two often go hand in hand.<sup>6</sup>

The meaning of design has also changed over time. Tether<sup>7</sup> provides a review of dozens of, often contradictory, definitions. One key agreement is that design should no longer be seen as “styling,” but as a core technical element or activity, central to industry and services throughout the economy. Herbert Simon’s general definition is useful as foundation: “Design is the transformation of existing conditions into preferred ones.”<sup>8</sup> However, this paper follows Sir George Cox’s definition because it also involves the needs of the customer or user: “Design... shapes ideas to become practical and attractive propositions for user or customers. Design may be described as creativity deployed to a specific end.”<sup>9</sup> Also note that the concept of design, like innovation, has recently broadened to include non-technical areas of human activity, such as policy, organization, and social issues.

- 2 N. S. Dorfman, *Innovation and Market Structure: Lessons from the Computer and Semiconductor Industries* (Cambridge, MA: Ballinger, 1987); M. I. Kamien and N. L. Schwartz, *Market Structure and Innovation* (Cambridge: Cambridge University Press, 1982).
- 3 R. R. Nelson: “The Simple Economics of Basic Scientific Research,” *Journal of Political Economy* 67:3 (1959): 297–306; A. Phillips, “Patents, Potential Competition and Technical Progress,” *The American Economic Review*, 56:1/2 (1966): 301–10.
- 4 R. R. Nelson and N. Rosenberg, “Technical Innovations and National Systems,” in *National Innovation Systems: A Comparative Analysis*, ed. R. R. Nelson (New York: Oxford University Press, 1993); J. Schmookler, *Invention and Economic Growth*, (Cambridge, MA: Harvard University Press, 1966).
- 5 Organizational innovation can include beneficial changes to structure, finance, marketing and distribution, and human resources. However, this paper focuses mainly on technological issues, including R&D and value-enhancing changes to products, services, and processes.
- 6 R. Stata, “Organisational Learning—the Key to Management Innovation,” *Sloan Management Review*, Spring (1989), 63–74; D. A. Garvin, “Building a Learning Organization,” *Harvard Business Review*, July–August (1993), 78–92.
- 7 B. S. Tether, “Think Piece” on the Role of Design in Business Performance (London: Department of Trade and Industry (DTI), HM Government, 2005).
- 8 M. Jahnke, *Innovation Through Design Thinking: an Experimental Study of the Implementation of Design Thinking in Non-designerly Firms; Report for the Doctoral Education Seminar on 25% Level* (Gothenburg, HDK, School of Design and Crafts, Business & Design Lab, The Faculty of Fine, Applied and Performing Arts University of Gothenburg, 2009), 13.
- 9 G. Cox, *Cox Review of Creativity in Business: Building on the UK’s Strengths* (London, HM Treasury, 2005), 2.



Juxtaposing these two sets of evolving definitions is useful in that there is clearly considerable overlap, with design as a technical activity playing a central role in the broader innovation process. Indeed, by any reasonable modern definition, design is a central part of industrial innovation.

### The Treatment of Design by Innovation Studies

When we examine innovation studies as a medium-sized subject area that conducts research and teaches innovation around the world, we see that design is either treated in passing or, more often, is entirely overlooked, apart from within specialized groups.<sup>10</sup> This oversight applies not only to teaching (e.g., there are 156 post-graduate Business Management courses in the UK alone that include innovation in their title or module content), but also to research, textbooks, theorizing, and other educational activities.<sup>11</sup> To answer “why should this be,” it is helpful to look briefly at the way innovation studies has evolved.

The field of innovation studies developed after World War II and has now spread to most corners of the world.<sup>12</sup> It has two main sources: (1) economists and other social scientists, frustrated with the way mainstream economics deals with the economy (e.g., usually in highly theoretical, abstract models, with little notion of history, institutions, science, or technology); and (2) engineering schools that began by teaching the management of technology to their students. Both sources now teach technology and/or innovation management, with masters courses proliferating during the past 20 years or so.

The theoretical and research side of innovation studies is dominated by “renegade” economists. They look in detail at the role and effect of technological innovation in the wider economy, in the industrial sector, and in individual firms. Joseph Schumpeter, the pioneer of the idea of creative destruction, attributed a paramount role to technology in economic cycles. Professors Richard Nelson, Sidney Winter (in the United States), and Christopher Freeman (in the United Kingdom) followed in Schumpeter’s footsteps, providing us with a much better understanding of the importance of innovation in economic activity of all kinds. There are now dozens of scholarly journals and hundreds of social scientists working on almost all aspects of innovation. Today, innovation studies goes beyond technology, looking at innovation in organizations, business strategy, and government policy.

However, when we look for a sensible or systematic treatment of design, we find it curiously absent. Design is sometimes mentioned, usually as one of the sequences of productive activity running from R&D to engineering, manufacturing, branding, marketing, and finally to distribution. Often it is not even mentioned in this sequence. Sometimes it is treated as a subset of the “D” of R&D, or more often, as one of the engineering sub-tasks that goes on within firms. Research and R&D are given prominence in research,

10 The classic product development studies include K. B. Clark, “The Interaction of Design Hierarchies and Market Concepts in Technological Evolution,” *Research Policy*, 14:5 (1985), 235–51; K. Ulrich, “The Role of Product Architecture in the Manufacturing Firm”, *Research Policy*, 24:3 (1995), 419–40; and C. Y. Baldwin, and K. B. Clark, *Design Rules, Vol. 1: The Power of Modularity* (Cambridge, MA: MIT Press, 2000). Design management texts include, for example, R. Cooper, and M. Press, *The Design Agenda: a Guide to Successful Design Management* (Chichester: John Wiley and Sons. 1995); and M. Bruce and J. Bessant, *Design in Business: Strategic Innovation Through Design* (Essex: Pearson Education, 2002). Also see two recent practice-oriented teaching textbooks on design management and strategy K. Best, *Design Management: Managing Design Strategy, Process and Implementation* (Lausanne: AVA/Academia Publishing SA 2006); B. von Stamm, *Managing Innovation, Design and Creativity* (Chichester, John Wiley and Sons. 2008). These are discussed in Part 2 of this article (forthcoming).

11 There are many “pockets” of design and new product development management research (e.g., the management of design/new product development and design management in small and medium-sized firms). However, these pockets tend not to feed into mainstream innovation theory, management, or policy.

12 No single agreed-on title is used for this field of study. It began as science and technology policy studies and now overlaps considerably with evolutionary and institutional economics, as well as energy, environmental, management, and organizational studies.

measurement, theory, teaching, and policy. The Frascati Manual of the Organisation for Economic Cooperation and Development (OECD) traditionally has provided agreed upon international definitions and measurements of R&D, and within it, government policies (more often than not) are all about research, with R&D usually synonymous with innovation.<sup>13</sup> For example, the main EU policy for innovation and competitiveness, to which member states agreed and then enshrined in the Lisbon Treaty, called for EU investment in R&D to increase to 3% of GDP by 2010. There is no mention of design.

As a result, the social sciences in general and innovation studies in particular have a very poor conceptualization of design as a creative economic activity at the firm, industry, and wider economic levels. We have few systems of measurement (especially compared with, say, R&D), and in leading innovation texts, we find scant treatment of design, which is reflected in most graduate and post-graduate innovation courses. For this paper, we reviewed ten of the most highly cited recent textbooks on innovation. None has a chapter exclusively on design, and most have only a few references to design in the index pages. Design is certainly researched and taught in other subject areas (e.g., especially in design schools). But surely a subject called “innovation studies,” which purports to teach, consult, educate, and advise business and government, should also deal systematically with design—and place design at the heart of theory and research.

One source of this problem may be the theoretical orientation of innovation studies. As Hatchuel points out,<sup>14</sup> the dominant approach to innovation is based on Herbert Simon’s idea of human problem-solving within “bounded rationality.”<sup>15</sup> This Nobel Prize-winning idea was a breakthrough at the time in that it overturned the mainstream economic assumption of perfect rationality. However, by treating innovation in general and design in particular as processes of solving problems, design as a core creative activity seems to have been left on the sidelines. As a result, much of innovation theory and teaching is appropriate for operational (e.g., routine) activities, but not for understanding creative and routine-breaking activities—of which design is one of the most important. Several important contributions now make this point in different ways.<sup>16</sup>

However, just noting this absence does not provide the whole picture. Identifying why design is not dealt with properly in innovation studies is actually quite hard. There is certainly no opposition to the idea of design, and there are, in fact, a few extremely good innovation papers on design that stress its central importance in business innovation.<sup>17</sup> In addition, a tradition of design management research and teaching is centered on product and process design in large and small firms.<sup>18</sup>

One possibility is that, in the face of hostility from educational structures and single-discipline subjects, innovation studies (which

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- 13 This perspective is changing with the OECD Oslo manual, which introduces non-technical and non-R&D innovation measures, such as marketing and organizational innovation. In fact, a recent study shows that design contributes 17% to innovation, compared with only 11% for R&D in the UK, during the period from 2000 to 2007, with innovation accounting for two thirds of UK private sector labor productivity (see, NESTA, *The Innovation Index: Measuring the UK's Investment in Innovation and its Effects* (London: National Endowment for Science, Technology and the Arts, 2009).
- 14 A. Hatchuel, “Towards Design Theory and Expandable Rationality: the Unfinished Programme of Herbert Simon,” *Journal of Management and Governance*, 5:3–4 (2002), 260–73.
- 15 H. A. Simon, “A Behavioral Model of Rational Choice,” in *Models of Man, Social and Rational: Mathematical Essays on Rational Human Behavior in a Social Setting*, ed. H. A. Simon (New York: Wiley, 1957).
- 16 For example, R. Buchanan, “Wicked Problems in Design Thinking,” *Design Issues*, 8:2 (Summer 1992), 5–21; F. Collopy, *Firing on All Eight Cylinders, Position Statement for the Conference: Convergence: Managing and Designing* (Cleveland: Weatherhead School of Management, June 2010), 17–9; R. J. Boland, F. Collopy, K. Lyytinen and Y. Yoo, “Managing as Designing: Lessons for Organization Leaders from the Design Practice of Frank O. Gehry,” *Design Issues* 24:1 (Winter 2008), 10–25.
- 17 V. Walsh, “Design, Innovation and the Boundaries of the Firm,” *Research Policy* 25:4 (1996), 509–29; Tether, “Think Piece.”

- 18 In the context of innovation studies, Walsh offers "...a first attempt at analysing the design function from a variety of disciplinary perspectives: economic, sociological and management" (509). This study remains one of the few design studies that offers a social science/innovation perspective. For design management teaching and research, see R. Roy and S. Potter, "The Commercial Impacts of Investment in Design," *Design Studies*, 14:2 (1993), 171–93; von Stamm, "Managing Innovation"; For new product development studies, see Bruce and Bessant, "Design in Business"; R. Cooper and E. Kleinschmidt, "Benchmarking Firm's New Product Performance and Practices," *Engineering Management Review* 23:3 (1995), 12–20; and R. Cooper, M. Bruce, A. Wootton, D. Hands and L. Daly, "Managing Design in the Extended Enterprise," *Building Research and Information* 31:5 (2003), 367–78. Research on design in small firms includes: S. Brazier, "Walking backward into Design: Support for the SME," *Design Management Review* 15:4 (2004), 61–70; G. Cawood, A. Lewis and G. Raulik, "International Perspectives on Design Support for SMEs," *Design Management Review*, 15:4 (2004), 71–6. M. Bruce, R. Cooper, and D. Vazquez, "Effective Design Management for Small Businesses," *Design Studies* 20:3 (1999), 297–315 and K. Jeffrey and D. Hunt, "Design in small manufacturing companies in Scotland," *Design Studies* 6:1 (1985), 18–24.
- 19 K. Pavitt, "Sectoral Patterns of Technical Change: Towards a Taxonomy and a Theory," *Research Policy* 13:6 (1984), 343–73.
- 20 R. R. Nelson and S. G. Winter, *An Evolutionary Theory of Economic Change*, (Cambridge, MA: The Belknap Press of Harvard University Press, 1982); for review, see M. C. Becker, N. Lazaric, R. R. Nelson, and S. G. Winter, "Applying Organisational Routines in Understanding Organisational Change," *Industrial and Corporate Change* 14:5 (2005), 775–91.
- 21 G. Dosi, R. R. Nelson and S. G. Winter, eds.: *The Nature and Dynamics of Organizational Capabilities* (Oxford: Oxford University Press, 2000).

is inherently multi-disciplinary) took to focusing on and modelling what could be more easily measured. R&D spending as an input to innovation is recorded by firms and governments internationally, while patents as a major output of R&D are also filed and recorded, leading to a great deal of theorizing, measurement, and techno-economic modelling of R&D performance at the firm, sector, and economic levels.<sup>19</sup> Perhaps the popular notion of organizational "routines"<sup>20</sup> and capabilities (defined as bundles of routines), drew attention away from design as a creative process, central to business success and renewal.<sup>21</sup>

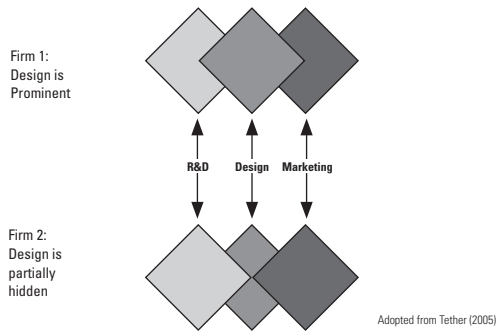
At the business practice level, there is little research on how designers work together creatively to develop solutions to complex, seemingly intractable, multi-disciplinary problems. One exception is Bucciarelli, who delves inside the real world of designers.<sup>22</sup> Another insightful book on engineering design is Vincenti, who shows how engineering knowledge differs fundamentally from scientific knowledge but is no less valid.<sup>23</sup> Conklin reveals how successful design teams work together.<sup>24</sup> They do not "rationally" plan in advance a complex new product or system, beginning with a concept or specification and choosing among solutions, in a Herbert Simon problem-solving fashion.<sup>25</sup> On the contrary, by recording and analyzing the discussions of designers at work, Conklin shows that multi-disciplinary design teams tend to begin with a very rough approximation of the "problem" (e.g., a new product) and then "leap" forward to generate possible solutions. They then move rapidly back to re-framing and re-specifying the problem, repeating this process again and again. Not only do they not move forward in a rational, linear fashion; they also design within teams, in a social process, which includes other specialists and potential users who provide immediate feedback, negative and positive, so they can all eventually arrive at a practical, agreed-upon way forward.

### Design and Innovation Management Studies

Increasingly, management scientists and organizational theorists are recognizing and so re-conceptualizing the role of design and design thinking in business, generating a new sub-field of academic inquiry and graduate and post-graduate teaching.<sup>26</sup> Few take an explicit social science innovation perspective, although organizational psychologists, notably Karl Weick, historians of technology such as Vincenti and others have much to say about the creative, ambiguous, and "messy" processes of design.<sup>27</sup> Within innovation studies, the role of design in business is typically viewed as a technical activity, rather than as a strategic activity of wider relevance to management. Even in this narrower domain, design is poorly understood. As Tether shows, design is usually treated as a sub-function in firms (e.g., within engineering), sometimes "hidden" within R&D or between the R&D and marketing functions (see Figure 1).

- 22 L. L. Bucciarelli, *Designing Engineers* (Cambridge MA: The MIT Press, 2004).
- 23 W. G. Vincenti, *What Engineers Know And How They Know It: Analytical Studies From Aeronautical History* (Baltimore: John Hopkins University Press, 1993).
- 24 J. Conklin, "Wicked Problems and Social Complexity" Chapter 1 in *Dialogue Mapping: Building Shared Understanding of Wicked Problems*, J. Conklin (London, Wiley, 2005).
- 25 Interestingly, rational and linear models also dominate in industry; e.g., in software engineering and quality improvement programs. See M. Hobday, and T. Brady, "Rational vs. Soft Management in Complex Software: Lessons from Flight Simulation," *International Journal of Innovation Management*, 2:1 (1998), 1–43.
- 26 H. Clark and D. Brody, eds. *Design Studies: a Reader* (Oxford: Berg, 2009); C. L. D Ym, A. M. Agogino, O. Eris, D. D. Frey and L. J. Leifer, "Engineering Design Thinking, Teaching and Learning," *Journal of Engineering Education* 94:1 (2005), 103–20; R. J. Boland and F. Collopy, "Design Matters for Management" in *Managing as Designing*, eds. R. J. Boland and F. Collopy (Stanford, CA: Stanford Business Books, 2004).
- 27 K. E. Weick, "Rethinking Organizational Design," in *Managing as Designing*, eds. R. J. Boland and F. Collopy (Stanford, CA: Stanford Business Books, 2004); K. E. Weick, "Designing for Thrownness," in *Managing as Designing*, eds. R. J. Boland and F. Collopy (Stanford, CA: Stanford Business Books, 2004).
- 28 B. S. Tether, "Think Piece" on the Role of Design in Business Performance (London: Department of Trade and Industry (DTI), HM Government, 2005).
- 29 R. Rothwell, "Towards the Fifth-generation Innovation Process," *International Marketing Review* 11:1 (1994), 7–31.
- 30 E. von Hippel, "Lead Users: a Source of Novel Product Concepts," *Management Science* 32:7 (1986), 791–806.
- 31 G. M. P. Swann and T. Watts, "Visualisation Needs Vision: the Pre-Paradigmatic Character of Virtual Reality," *The Virtual Society? Technology, Cyberbole, Reality*, ed. S. Woolgar (Oxford: Oxford University Press, 2002).

**The Importance of Design—A Matter of Perspective?**



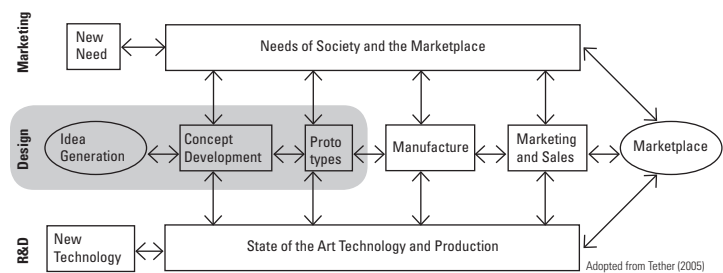
Tether presents evidence to argue that companies that invest in design perform better against most indicators.<sup>28</sup> He also notes that design activities within firms are underreported because “who does design” is often unclear: Is design strictly a professional activity, or is it undertaken by a range of non-recognized and unqualified personnel?

Tether also shows how design maps onto so-called Third Generation innovation “coupling” models,<sup>29</sup> whereby a role for lead users is envisaged for product specification, design, and re-design (see Figure 2).<sup>30</sup> Here again, design is viewed as a bridging function, located somewhere between R&D and manufacturing/marketing.

Using data from the UK Design Council’s National Survey of Firms, Tether shows that, in the UK, only 33% of firms view design as a strategic business tool (e.g., for company differentiation) and a contributor to bottom-line performance.

Tether provides an interesting collection of modern definitions of design; however, a commonly agreed-on definition or a clear taxonomy of different kinds of design (e.g., architecture, product design, service design, and graphic design) is not yet apparent. No doubt, each category has its own professional trajectory and stage of maturity. The design fields appear mostly to be at a pre-paradigmatic (or pre-disciplinary) stage.<sup>31</sup> This interpretation is confirmed by Poggenphol et al., who show that little agreement emerges on the meaning of key design terms,<sup>32</sup> or on what constitutes core

**The “Coupling Model” of Innovation with Design as a Bridging Function**



knowledge, and that a reasonably coherent research infrastructure is lacking. However, because design is so human-centered and situated in practice, one possibility is that some fields of design may never become a professional discipline in the sense of engineering or accountancy.<sup>33</sup> It may always be subject to evolution, diversity, and inter-disciplinarity, relying on human imagination, rather like software engineering.<sup>34</sup>

A key omission in the field is an understanding of how different design fields map onto various sectors and industries, including the many service sectors. Much of the design management literature focuses on manufacturing, whereas the service sector is a far larger proportion of most economies. To illustrate, manufacturing accounts for around 13% of GDP in the United Kingdom, 12% in the United States, and 13% in France, compared with around 75% for services.

In addition, a highly significant literature on design has emerged in the product development field, a branch of innovation management. Clark<sup>35</sup> introduces a new theoretical framework to examine the relationship between design decisions and choice of customers, using examples from automobiles and semiconductors. Clark argues that the logic of problem solving leads to a hierarchical structure for the evolution of design, which, in turn, has a shaping influence on the dynamics of competition.

Building on the work of Clark and others, Ulrich<sup>36</sup> integrates ideas from design theory, software engineering, and other fields to illustrate how product architecture operates as a scheme by which the functions of the product are allocated to physical components. Ulrich examines, in depth, the far-reaching implications of the role of product architecture across manufacturing, showing how it relates to various aspects of firm performance.

Design and innovation are also approached from a product platform perspective in the product development literature. For example, Baldwin and Clark develop the concept of design rules,<sup>37</sup> whereby design occurs within a product or system, and the design limits imposed by the increasing complexity of artifacts are overcome through the product or system's modularization. In their study of computer design, using the case of IBM's System/360, they attribute design evolution to the application of six modular operators: splitting a system into two or more modules, substituting one module design for another, augmenting (or adding a new module to a system), excluding a module from a system, inverting to create new design rules, and porting a module to another system.<sup>38</sup> Innovation occurs when a design becomes "truly modular," in that changes in one module do not affect other modules. In other words, as long as designers follow design rules pertaining to the architecture of the artifact, they are free to innovate without reference to the product architecture.

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- 32 S. H. Poggenpohl, P. Chayutshakij and C. Jeamsinkul, "Language Definition and its Role in Developing a Design Discourse," *Design Studies* 25:6 (2004), 579–605.
- 33 L. Kimbell, "Manifesto for the M(B)A in Designing Better Futures," forthcoming in *The Handbook of Design Management*, eds. R. Cooper, S. Junginger and T. Lockwood (Oxford: Berg, 2010).
- 34 M. Hobday and T. Brady, "Rational vs Soft Management in Complex Software: Lessons from Flight Simulation," *International Journal of Innovation Management*, 2:1 (1998), 1–43.
- 35 K. B. Clark, "The Interaction of Design Hierarchies and Market Concepts in Technological Evolution," *Research Policy*, 14:5 (1985), 235–51.
- 36 K. Ulrich, "The Role of Product Architecture in the Manufacturing Firm," *Research Policy*, 24:3 (1995), 419–40
- 37 C. Y. Baldwin, and K. B. Clark, *Design Rules*, Vol. 1: The Power of Modularity (Cambridge, MA: MIT Press, 2000)
- 38 *Ibid.*, 12–3.

Baldwin and Clark's contribution is significant in that they also seek to quantify the effect of modularization in terms of system value. They introduce the concept of the modular cluster to represent firms and markets that are host to the "evolution of a set of modular designs."<sup>39</sup> Such firms benefit from reductions in transaction and agency costs and from collaboration and distributed working.

Another notable body of research in information systems deals with design science. One prominent example is Hevner et al.,<sup>40</sup> who show how the field of design science tries to extend the boundaries of organizational and human capabilities through the creation of designed artifacts. Hevner et al. show how design science can produce artifacts in the form of a construct, a model, or a method, with the goal of creating technology-based solutions to business problems. In effect, this move provides a rigorous, research-based approach to process innovation through the use of information systems in organizations.

In the field of innovation management, some researchers have tried to show how design can be more effectively deployed in business, treating design as a definable resource that needs purposeful management. Meanwhile, Walsh points to the diffuseness and variety of design types, which renders the conversion of design into a strategic asset for firms very difficult. Design clearly covers a wide range of fields, activities, and tasks, including product performance, process efficiency, cost, ease of manufacturing, aesthetics, user friendliness, durability, and ergonomics. It remains an ill-defined activity in terms of organizational boundaries, often resulting in difficulties for managers as they try to coordinate it and for teams as they try to work together effectively.

In contrast, Whyte et al. argue that design can be used as a strategic resource within a firm;<sup>41</sup> they draw from new models of innovation management, central to which are advanced simulation and prototyping tools. They argue that the latter can enable design teams—particularly those working on complex, large-scale projects—to coordinate development activities inside and outside the firm, engaging clients in the design process and presenting ideas to end-users, clients, managers, funding institutions, and planners.

In an effort to identify key factors that work against the effective use of design in businesses, Whyte et al. offer an extensive checklist drawn from innovation studies, including continuous improvement, lean manufacturing, teamwork, and new product development tools.<sup>42</sup> Whyte et al. argue that there is no guaranteed recipe for success in design,<sup>43</sup> but there is consistency among researchers about the kinds of factors that support the management of any process, including design. These factors include:

- Top management commitment;
- Clear concept definition;
- Voice of the customer (e.g., dedication to the market and customer inputs throughout the project);

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39 Ibid., 16.

40 A. Hevner, S. March, J. Park, and S. Ram, "Design Science in Information Systems Research," *Management Information Systems Quarterly* 28:1 (2004), 75–105.

41 J. Whyte, J. Bessant and A. Neely, *Management of Creativity and Design Within the Firm* (London: DTI, 2005).

42 Their list is drawn from: J. Bessant and S. Caffyn, "High Involvement Innovation Through Continuous Improvement," *International Journal of Technology Management* 14:1 (1997), 7–28; Bruce and Bessant, "Design in Business:" Cooper, et al "Managing Design in the Extended Enterprise."

43 J. Whyte, J. Bessant and A. Neely, *Management of Creativity and Design Within the Firm* (London: DTI, 2005).

- Product advantage (e.g., differentiated unique benefits, superior customer value);
- Well-planned and adequately resourced launch;
- Tough decision points and stage gate model, with close monitoring at each stage;
- Overlapping/parallel working;
- Concurrent or simultaneous engineering to aid faster development, while retaining cross-functional involvement;
- Choice of structure (e.g., matrix, line, project) to suit conditions and task; and
- Cross-functional team working, involvement of different perspectives, use of team-building approaches to ensure effective team working and to develop capabilities in flexible problem-solving.

Best and separately von Stamm recommend similar tools from innovation studies, treating design as a function within a firm that can be managed and exploited to good effect and recommending structured processes, stage gate models, and other management processes and tools.

One limitation of this fairly standard innovation perspective is that it tends, implicitly at least, to privilege a particular view of “the firm”—typically a large manufacturing firm or service provider characterized as a rational, “machine-like” entity amenable to process improvement and fine tuning. However, as noted—and paradoxically, from the design field itself—modern design thinking challenges this view of the firm as a decision-making, rational entity.

Also, from a broader social science perspective, we should also acknowledge other competing metaphors for representing business organizations. For example, Morgan compares the dominant “organizations as machines” view with other metaphors of the firm (e.g., as intelligent “organisms” responding to their environment in an open system, rather than as a sealed unit of machinery).<sup>44</sup> He, and many others, point to organizational leadership, intelligence, learning, motivation, ambiguity, informality, power, conflict, and “anxiety” in shaping organizational culture and performance. Indeed, “the firm as a machine” view has its roots in the scientific management approach, pioneered by Frederick W. Taylor.<sup>45</sup> This view has long had its critics, beginning with Mary Parker Follett who, even as a member of the Taylor society, criticized Taylor’s perspective, arguing that firms were deeply social and no strictly economic units.<sup>46</sup>

This critical analysis is not to say that structure, order, and management tools cannot be useful. However, they need to be appreciated and deployed within a more holistic, “human” appreciation of the firm, and their limits require acknowledgement, as well as study. Hobday and Brady and Davies and Hobday,<sup>47</sup> in

44 G. Morgan, *Images of Organization* (London: Sage Publications, 1986); R. R. Nelson, “The Simple Economics.”

45 F. W. Taylor, *Principles and Methods of Scientific Management* (New York: Harper and Row, 1911).

46 The debate between Taylor and Follett (1918) is discussed by Peter Drucker, who credits many of his own ideas to Follett (see P. Graham, *Mary Parker Follett - Prophet of Management* (Boston, MA: Harvard Business School Press, 1995), 24–31).

47 Hobday and Brady, “Rational vs Soft Management”; A. Davies, and M. Hobday, *The Business of Projects: Managing Innovation in Complex Products and Systems* (Cambridge: Cambridge University Press, 2005).

their work on complex software processes and other major high technology projects, argue that management tools and systems need to be combined with practitioner engagement (e.g. in the development of tools), empowerment, motivation, and leadership if the firm is to succeed. Much of the failure of software projects, for example, stems from an overly rational approach to project management.

In the case of small and medium-sized enterprises (SMEs) and micro-entrepreneurial activity, the problems of adopting a process/machine-based analogy is intensified because such firms typically operate much less formally than large firms do. In this context, a “managing the process” approach is even less appropriate. Recognizing this lack of fit is important because these firms actually make up the vast majority of business organizations and account for the vast majority of the employed population.<sup>48</sup>

Unfortunately, research into design and new product development tends to assume a process/rational approach, rather than looking deeply into the social and cultural nature of different kinds of SMEs and the “universe” they inhabit. As Woolgar and Vaux show from an ethnographic perspective,<sup>49</sup> this world is a vastly different from that of the typical perception of an SME. SMEs are typified by limited capabilities and informal character, compared with the model of the rational large firm. Small firms cannot be treated solely as decision-making entities any more than large firms can (and perhaps much less).

Indeed, the idea of design as a human-centered, core creative activity in business challenges the overly scientific, rational view of the firm and, with it, the standard intervention tools of innovation management. The design approach to tackling complex or “wicked” problems raises considerable doubts about the validity of process-based, rational approaches to organizational improvement—calling instead for a human-centered approach that emphasizes leadership, informality, and ambiguity in the organization. From a management perspective, if organizations do not conform to the rational, decision-making view, then standard management tools can be ineffective or even counterproductive. Instead, management approaches should focus on understanding the social life of firms, learning how they manage the “white spaces” between the boxes on the organization chart so as to harness the power of informal organization.<sup>50</sup> At the very minimum, a rebalancing in favor of human-centered management is needed, as shown by the design thinking movement, as we discuss in detail in Part 2 of this article.

## Conclusion

In general, design has been poorly conceptualized, researched, and taught by innovation studies. Although the meanings of both innovation and design have changed over time, one key agreement is that design is a core technical and creative activity, central to

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48 Typically, around 70% of the employed population works for an SME, and SMEs represent 98% of all enterprises.

49 S. Woolgar and J. Vaux, “Abilities and Competencies Required, Particularly by Small Firms, to Identify and Acquire New Technology,” *Technovation* 18:8/9 (1998), 575–84.

50 M. Maletz and N. Nohria, “Managing in the Whitespace,” *Harvard Business Review* 79:2 (2001), 102–11; C. I. Barnard, *The Functions of the Executive* (Cambridge, MA: Harvard Business Press, 1938).



industrial and service innovation throughout the economy. However, if we examine innovation studies, design is either treated superficially or entirely overlooked, apart from specialized pockets of research and teaching. This “gap” applies to innovation teaching, research, textbooks, theorizing, and other educational activities. As a result, the social sciences in general, and innovation studies in particular, have a very poor conceptualization of design as a creative economic activity at the firm, industry, and wider economic levels. In addition, few systems of measurement have been developed and applied, especially compared with R&D.

One possible reason is that the dominant approach to innovation conceptualization is based on Herbert Simon’s idea of human problem-solving within “bounded rationality,” which treats innovation in general and design in particular as processes for solving problems. As a result, design as a creative, generating, change-inducing activity has been “left on the sidelines.” Nevertheless, a few extremely good innovation papers on design do reveal its central importance in business innovation and there is also a long tradition of design management research and teaching centered on product and process design which accepts the significance of design.

From an innovation and social science perspective, the treatment of design as a human-centered, core creative activity in business challenges the overly scientific, rational view of the firm and, with it, many of the standard intervention tools of innovation management. In the next segment of this article, we examine the emerging field of design thinking, showing how it promises not only to deal with the creative, ambiguous, and “messy” processes of design but also other domains of complex or “wicked” problems. We also argue that, by combining some of the frameworks and insights of innovation analysis with new approaches to design, both areas stand to gain.

# The Design Stance in User-System Interaction

Nathan Crilly

## Introduction

Ideas about what users think and do have always had an important place in the theory and practice of design.<sup>1</sup> These ideas are especially important when trying to understand how users interact with designed systems, whether those systems are physical products, digital interfaces, or more abstract services. In recent years, traditional concerns for the users' efficiency, safety, and satisfaction have expanded to also include issues like meaning, engagement, and fulfilment.<sup>2</sup> Consequently, attention is now focused on how interactions are situated in contexts of use,<sup>3</sup> how users are constructed during interaction,<sup>4</sup> and how interaction can itself be aesthetic.<sup>5</sup> These broader concerns reflect a more humane approach to users, respecting them as active, aware, and intelligent people rather than just viewing them as being less predictable than the designed systems with which they interact.<sup>6</sup>

This article suggests that fully respecting users' sophistication means acknowledging that they have the capacity to recognize that designed systems *have been designed*. That is, as users interact with systems, they may reason about the design processes from which these systems result. Such reasoning may help users predict the behavior of systems, especially when they consider how designers might have expected users to act. Furthermore, this reasoning may also influence other aspects of how users experience a system, including the meaning that it holds for them, their engagement with it, and the fulfillment that it brings. This article refers to these phenomena as users adopting a design stance towards the system.

The term "design stance" was coined by philosopher Daniel Dennett, who proposed that an effective way for users to reason about how a system will behave is to think about what it was designed to do.<sup>7</sup> The design stance and other related concepts have received a great deal of attention from philosophy, psychology, and a broad range of other disciplines that are concerned with the interpretation and use of artifacts. Despite Dennett's prominence, and despite the relevance of the design stance to how people interact with designed systems, this concept has attracted relatively little discussion in the literature on interaction and design. This literature also contains very few empirical studies that can be related to the design stance, and in any case, those studies that are relevant primarily focus on other phenomena. Consequently, the role of the

- 1 Victor Margolin, "Getting to Know the User," *Design Studies* 18:3 (1997): 227–36; Phillip E. Agre, "Conceptions of the User in Computer Systems Design," in *The Social and Interactional Dimensions of Human-Computer Interfaces*, ed. Peter J. Thomas (Cambridge, UK: Cambridge University Press, 1995), 67–106; Geoff Cooper and John Bowers, "Representing the User: Notes on the Disciplinary Rhetoric of Human-Computer Interaction," in *The Social and Interactional Dimensions of Human-Computer Interfaces*, ed. Peter J. Thomas (Cambridge, UK: Cambridge University Press, 1995), 48–66.
- 2 Daniel Fallman, "Persuade Into What? Why Human-Computer Interaction Needs a Philosophy of Technology," in *Proceedings of the 2nd International Conference on Persuasive Technology* (Palo Alto, CA: Springer-Verlag, 2007), 295–306.
- 3 Lucy Suchman, *Plans and Situated Actions* (Cambridge, UK: Cambridge University Press, 1987).
- 4 Johan Redström, "RE: Definitions of Use," *Design Studies* 29:4 (2008): 410–23.
- 5 Caroline Hummels and Kees Overbeeke, "Special Issue Editorial: Aesthetics of Interaction," *International Journal of Design* 4:2 (2010): 1–2; Paul Locher, Kees Overbeeke, and Stephan Wensveen, "Aesthetic Interaction: a Framework," *Design Issues* 26:2 (Spring 2010): 70–9.
- 6 Liam Bannon, "From Human Factors to Human Actors: the Role of Psychology and Human-Computer Interaction Studies," in *Design at Work: Cooperative Design of Computer Systems*, ed. Joan M. Greenbaum and Morten Kyng (Hillsdale, NJ: Lawrence Erlbaum Associates, 1991), 25–44.
- 7 Daniel C. Dennett, *The Intentional Stance* (Cambridge, MA: The MIT Press, 1987).

- 8 For example, Stephen J. Payne, "Users' Mental Models: the Very Ideas," in *HCI Models, Theories, and Frameworks*, ed. John M. Carroll (San Francisco, CA: Morgan Kaufmann, 2003); Martina A. Sasse, "Users' Models of Computer Systems," in *Models in the Mind*, ed. Yvonne Rogers, Andrew Rutherford, and Peter A. Bibby (London, UK: Academic Press, 1992), 225–40; Richard M. Young, "The Machine Inside the Machine: Users' Models of Pocket Calculators," *International Journal of Man-Machine Studies* 15:1 (1981): 51–85; Nancy Staggers and A. F. Norcio, "Mental Models: Concepts for Human-Computer Interaction Research," *International Journal of Man-Machine Studies* 38:4 (1993): 587–605.
- 9 This capacity for theory of mind may actually be a basic requirement for designing. Andy Dong, "Biological First Principles for Design Competence," *AI EDAM* 24:04 (2010): 460–1.
- 10 For example, see Klaus Krippendorff and Reinhart Butter, "Product Semantics: Exploring the Symbolic Qualities of Form," *Innovation: The Journal of the Industrial Designers Society of America* 3:2 (1984): 6; Donald A. Norman, *The Psychology of Everyday Things* (New York, NY: Basic Books, 1988), 16.

design stance in user-system interaction has still not been thoroughly explored, either conceptually or empirically.

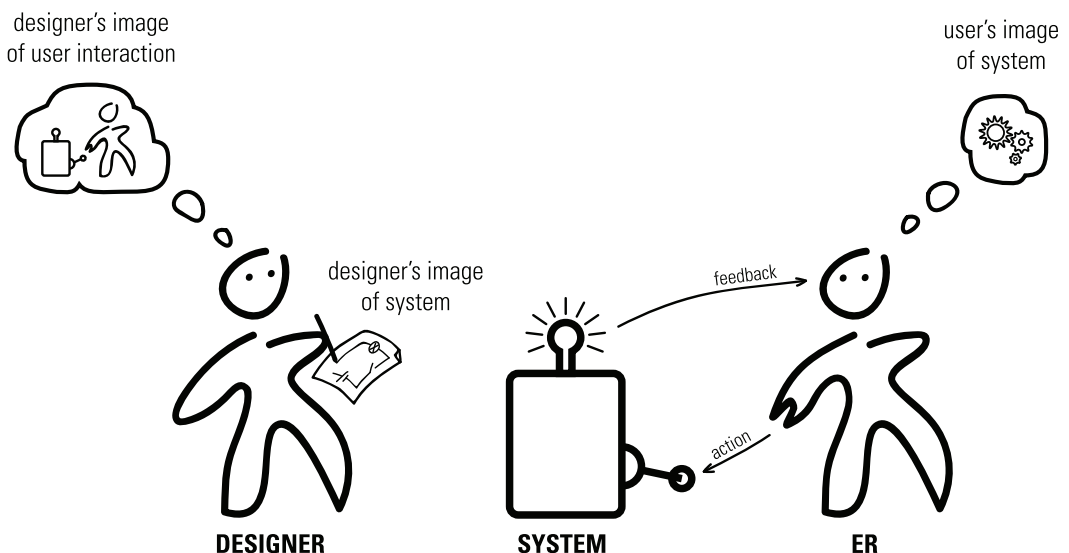
The objective of this article is to encourage a focus on the design stance so that its relevance to user-system interaction might be better understood. To support this goal, the relationship between designers, users, and systems is presented, first as it is conventionally understood and then in the way it is considered here. Next, the design stance is outlined in the terms in which Dennett introduced it, but it is then strengthened and broadened through references to other related work. Attending to this other work demonstrates that the design stance holds implications for studying not only how things are used, but also how they are experienced. It further shows how the design stance is related to—and yet distinct from—other concepts with which interaction researchers have been concerned. With the design stance defined and contextualized, its analytic value is then illustrated by applying it to a detailed account of an interaction episode.

### The User's Image of the Designer

In an effort to understand how people interact with designed systems, cognitive studies have traditionally emphasized the idea that users construct a "mental model" of how a system works, and that they use that model to interact with the system.<sup>8</sup> This perspective is often represented with a diagram (see Figure 1) that depicts three key things: (1) The designer has an image of how a system will work and how the user will interact with it,<sup>9</sup> (2) the system presents the user with certain opportunities for actions and offers feedback in response to those actions, and (3) the user forms an image of how the system works based on their interactions with it.<sup>10</sup> This diagram exists in various forms, but all forms depict how users

Figure 1

The designer thinks about the system and the user, and the user thinks about the system.



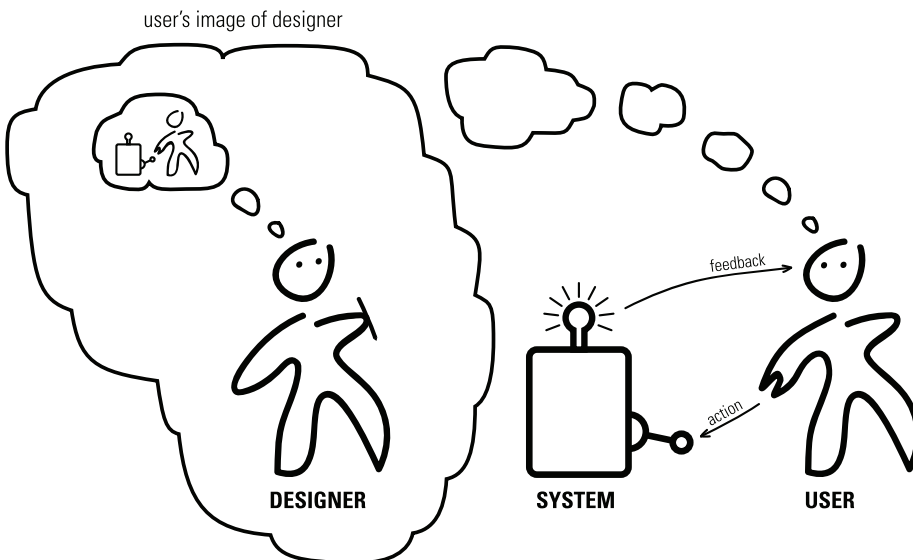
- 11 Nathan Crilly, David Good, Derek Matravers, and P. John Clarkson, "Design as Communication: Exploring the Validity and Utility of Relating Intention to Interpretation," *Design Studies* 29:5 (2008): 425–57; Nathan Crilly, Anja Maier, and P. John Clarkson, "Representing Artefacts as Media: Modelling the Relationship Between Designer Intent and Consumer Experience," *International Journal of Design* 2:3 (2008): 15–27.

interact with systems independently of designers, and how designers communicate with users through the systems they design.<sup>11</sup>

In the traditional mental models approach, the user's understanding of the system seemingly develops without the user being aware that the system has been designed. There is no explicit acknowledgement that users have the capacity to recognize *that they are users*—users whose interactions with the system will have been anticipated. As such, in Figure 1 the designer is viewed as having an image both of the system and of the user's interaction with it, but the user is viewed simply as having an image of the system. What is not shown is that through interaction with the system the user might also form an image of the designer, and also an image of the designer's image of the user. This image that the user holds of the designer need not be well formed and need not be accurate for it to influence the user's response to the system (see Figure 2). Note that unlike Figure 1, which presents acts of design and acts of use in the same view, Figure 2 only presents acts of use; the designer is imagined by the user, and only the system, the user, and the user's thoughts are actually depicted.

If users were to view technological systems as a consequence of human thought and action, they could reason about those systems on the grounds that they result from intentional design processes. This orientation towards the design process might allow users to better explore, discover, and anticipate the behavior of technological systems because they would recognize that use of those systems has been considered and designed for. For example, such awareness of design might help users to determine where a particular feature could be ("*where would the designer have put it?*") or how something might be operated ("*how was I expected to use it?*"). In approaching technology in this way, users could exploit their wealth of experience

Figure 2  
The user thinks about the designer of the system, and also about the designer's thoughts about the user.



in social interactions, leveraging their knowledge of how people think about people to understand how a designer might have thought about them. Where this social knowledge is more developed than users' technical knowledge, their awareness that the system has been designed might promote interactions that are more effective and more rewarding. In other words, it may be better for users to think about *why* the system is the way it is, rather than to just think about *what* the system is or *how* it works.

### The Design Stance

The perspective illustrated in Figure 2 can be related to Dennett's design stance. This is just one of three stances that Dennett claims people adopt when they are making predictions about how things will behave.<sup>12</sup> On Dennett's account, for relatively simple things (e.g., doors and chairs), people can predict the behavior of objects purely on the basis of physical structures obeying physical laws. In adopting this "physical stance" toward objects, people use some intuitive grasp of physics to predict that, for example, pushing the back of a chair beyond a certain point will cause it to topple over. (Compare the adoption of this stance with the perception of "affordances," a concept that is typically used to emphasize a relational capacity for *action* rather than an intuitive means of *prediction*.)<sup>13</sup>

For things that are more complicated than doors and chairs (e.g., clocks and calculators), most people have insufficient knowledge of the physical structure and workings to reliably predict how those objects operate simply by adopting the physical stance. Instead, people adopt a "design stance" toward such objects, which allows them to make these predictions based on the assumption that the object will behave *as it is designed to behave*. Having some idea of what a calculator *is supposed to do* when a button is pressed gives people some clues as to what it might actually do. Or, with respect to computers, and in Dennett's own words,

[M]ost users of computers have not the foggiest idea what physical principles are responsible for the computer's highly reliable, and hence predictable, behaviour. But if they have a good idea of what the computer is designed to do (a description of its operation at any one of the many possible levels of abstraction), they can predict this behaviour with great accuracy and reliability, subject to disconfirmation only in cases of physical malfunction.<sup>14</sup>

Although Dennett refers to the users' ideas about design, in recent discussions of the design stance, considerable debate has arisen as to whether design stance reasoning is based simply on knowledge of the system's function (without reference to the designer's intentions) or whether it is based on knowledge of the designer's *intended* function.<sup>15</sup> However, in contrast to the biological organisms with which Dennett is primarily concerned, the functions of

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- 12 Daniel C. Dennett, "Intentional systems," *The Journal of Philosophy* 68:4 (1971): 87–106; Dennett, *The Intentional Stance*; Dennett, "The Interpretation of Texts, People and Other Artifacts," *Philosophy and Phenomenological Research* 50 (1990): 177–94.
- 13 James J. Gibson, *The Ecological Approach to Visual Perception* (Boston, MA: Houghton Mifflin, 1979); Joanna McGrenere and Wayne Ho, "Affordances: Clarifying and Evolving a Concept," in *Proceedings of Graphics Interface 2000* (Montreal, Canada: ACM Press, 2000), 179–96; Norman, *The Psychology of Everyday Things*.
- 14 Dennett, *The Intentional Stance*, 17.
- 15 Matthew Ratcliffe, "A Kantian Stance on the Intentional Stance," *Biology and Philosophy* 16:1 (2001): 29–52; Giacomo Romano, *Thoughtful Things: an Investigation in the Descriptive Epistemology of Artifacts* (PhD Thesis: Technische Universiteit Eindhoven, 2009); Krist Vaesen and Melissa van Amerongen, "Optimality vs. Intent: Limitations of Dennett's Artefact Hermeneutics," *Philosophical Psychology* 21:6 (2008): 779–97.

technical systems are generally taken to depend on the intentions of the system's creator. Therefore, to adopt a design stance toward a technical system is to reason about what the designer wanted and about how the designer acted. Throughout this article, it is this stronger version of the design stance (or the "designer stance") with which we are concerned.<sup>16</sup>

If the behavior of simple things can be predicted with the physical stance, and more complicated things with the design stance, Dennett suggests that a third stance is adopted for things that are yet more complicated still. For things like animals and people, neither the physical stance nor the design stance is effective; instead we must adopt an "intentional stance." Here, intentions are attributed to the things themselves, and their behavior is predicted on the basis that they will behave in ways that suit their own goals. For example, if we recognize that an animal is hungry, then we can predict how that animal will behave when it is presented with food by expecting that it will act to satisfy its drives.

The adoption of the intentional stance need not be reserved just for truly intentional systems; someone might predict the behavior of a computer by adopting the intentional stance (e.g., if its sophistication suggests that it is taking goal-directed actions). Similarly, someone might adopt the physical stance to predict the behavior of a calculator (e.g., if it were being dropped), and someone might predict the behavior of an animal's heart by adopting the design stance (e.g., if Mother Nature were thought to have designed it to serve some function). As such, although it might at first seem that the stance a person adopts is determined by the type of entity with which they interact, it is really determined pragmatically by some trade-off between the reliability of the predictions that a stance permits and the efforts required to make those predictions from that stance.<sup>17</sup>

### The Scope of the Design Stance

Dennett's three stances have been very influential and have particularly attracted the attention of philosophers concerned with the mind, its workings, and its evolution.<sup>18</sup> However, psychologists have also taken an interest in Dennett, and the design stance is now explicitly associated with a significant stream of experimental work.<sup>19</sup> This work has shown that people name and categorize artifacts according to what they believe the designers' intentions were. For example, a collection of things called "clocks" might all be considered *to be* clocks even if those things take different physical forms (e.g., analogue and digital clocks), and even if they do not all tell the time (e.g., because they are broken or need a new battery). This is because these things were all intended to be clocks, and their form and behavior are just clues to this intention. Conversely, something might very well resemble a clock (perhaps a child's drawing) and something might accidentally permit the time to be read (perhaps the

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- 16 Stefano Borgo, Massimiliano Carrara, Pawel Garbacz, and Pieter E. Vermaas, "The Design and the Designer Stance," in *Vol. 1 of Copenhagen Working Papers on Design*, ed. Helle Hove and Per Galle (presented at the CEPHAD 2010: The Borderland between Philosophy and Design Research, Copenhagen, Denmark: Danish Design School Press, 2010), 39–40. Also see Pieter E. Vermaas, Massimiliano Carrara, Stefano Borgo, and Pawel Garbacz, "The Design Stance and Its Artefacts," *Synthese* (2011). doi:10.1007/s11229-011-9885-9.
- 17 John Heil, *Philosophy of Mind: a Contemporary Introduction*, 2nd ed. (New York, NY: Routledge, 2004), 157–8.
- 18 For example, see notes 15 and 16, and also contributions in Don Ross, Andrew Brook, and David L. Thompson, eds., *Dennett's Philosophy: A Comprehensive Assessment* (Cambridge, MA: MIT Press, 2000). Dennett's three stances have also concerned those interested in design cognition. Charles Burnette, "Intentionality and Design," in David Durling and John Shackleton, *Common Ground: Design Research Society International Conference*, London, UK (2002): 12; Udo Kannengiesser and John S. Gero, "Understanding Situated Design Agents," in *CAADRIA'05*. (TVB, New Delhi, 2005): 277–87.
- 19 See review in Deborah Kelemen and Susan Carey, "The Essence of Artifacts: Developing the Design Stance," in *Creations of the Mind: Theories of Artifacts and Their Representation*, ed. Eric Margolis and Stephen Laurence (Oxford: Oxford University Press, 2007), 212–30.

moving shadow from a building), but if people don't think those things were intended to be clocks, then those things won't be thought of as being clocks.<sup>20</sup>

Beyond psychological research, and independently of Dennett, the inference of creative intentions is considered to be of central importance to the interpretation of many acts and media.<sup>21</sup> This perspective is notably influential in the study of spoken and written communication,<sup>22</sup> but it also is important when considering paintings,<sup>23</sup> prehistoric relics,<sup>24</sup> architecture,<sup>25</sup> cinema,<sup>26</sup> consumer products,<sup>27</sup> branding,<sup>28</sup> and advertising.<sup>29</sup> Although the disciplines that study these various kinds of artifacts use different terminology (e.g., "intent attribution," "inference of intention," "persuasion knowledge"), they all describe phenomena closely related to the design stance, and all consider those phenomena to strongly influence how artifacts are experienced. The attribution of design intention therefore affects not only what an artifact is, but also what it means and how it is responded to.

Those disciplines that focus on how people construct an image of an artifact's creator implicitly invoke the idea that people have beliefs about other people's thoughts. More formally, the concept of folk psychology (or naïve psychology) is used to describe this common-sense knowledge of cognition that lay people use to predict and explain the behavior of others.<sup>30</sup> This knowledge is not always correct and does not always permit accurate predictions,<sup>31</sup> but it is still influential in determining how people interact socially.<sup>32</sup> In these terms, we might consider whether people possess a folk knowledge of design that tells them how a technical system came into existence, what decisions have been made about it, and what drove those decisions. Such reasoning involves folk psychology being applied through abduction: Rather than predicting human behavior on the basis of some naïve understanding of psychology, people explain the results of human behavior (the system) on the basis of some more or less naïve understanding of the design process and the psychology behind it.<sup>33</sup>

From across the range of disciplines that have been concerned with something like Dennett's design stance, we see that when people reflect on the agent responsible for a system, these reflections might influence more than just predictions about that system's behavior. Instead, these reflections might also influence the way in which people categorize what a system is, understand why it is there, and assess its aesthetic and symbolic value. To cover this range, the term "design stance" is here used in a broader sense than Dennett himself used it. However, there is good precedent for this expansion in the large body of psychological work that is conducted under the heading of "design stance" research.<sup>34</sup> Consequently, in this article, "design stance" is used to refer to the way in which users' engagement with systems is mediated by their conception of the design activities from which those systems result.

- 20 H. Clark Barrett, Stephen Laurence, and Eric Margolis, "Artifacts and Original Intent: a Cross-Cultural Perspective on the Design Stance," *Journal of Cognition and Culture* 8:1 (2008): 1–22; Paul Bloom, "Intention, History, and Artifact Concepts," *Cognition* 60:1 (1996): 1–29; Tim P. German and Susan C. Johnson, "Function and the Origins of the Design Stance," *Journal of Cognition and Development* 3:3 (2002): 279–300.
- 21 Raymond W. Gibbs, *Intentions in the Experience of Meaning* (Cambridge: Cambridge University Press, 1999).
- 22 Raymond W. Gibbs, Julia M. Kushner, and W. Rob Mills, "Authorial Intentions and Metaphor Comprehension," *Journal of Psycholinguistic Research* 20:1 (January 1991): 11–30; Raymond W. Gibbs, "Authorial Intentions in Text Understanding," *Discourse Processes* 32:1 (2001): 73–80; H. P. Grice, "Meaning," in *Philosophical Logic* (London: Oxford University Press, 1967), 39–48; John R. Searle, *Speech Acts: An Essay in the Philosophy of Language* (Cambridge, UK: Cambridge University Press, 1969); Dan Sperber and Deirdre Wilson, *Relevance: Communication and Cognition* (Oxford, UK: Blackwell, 1986).
- 23 Richard Kuhns, "Criticism and the Problem of Intention," *The Journal of Philosophy* 57:1 (1960): 5–23; Jerrold Levinson, "Defining Art Historically," *British Journal of Aesthetics* 19:3 (1979): 232–50; Jerrold Levinson, "Refining Art Historically," *The Journal of Aesthetics and Art Criticism* 47:1 (1989): 21–33.
- 24 Cameron Shelley, "Visual Abductive Reasoning in Archaeology," *Philosophy of Science* 63:2 (1996): 278–301; Elizabeth Slater, "Studying Artefacts," in *Companion Encyclopedia of Archaeology (Volume 1)*, (London, UK: Routledge, 1999), 344–88.
- 25 Juan Pablo Bonta, *Architecture and Its Interpretation: A Study of Expressive Systems in Architecture* (New York, NY: Rizzoli, 1979).
- 26 David Bordwell, *Making Meaning: Inference and Rhetoric in the Interpretation of Cinema* (Cambridge, MA: Harvard University Press, 1989).

## The Design Stance in Human-Computer Interaction

Although concepts like the design stance have excited those disciplines concerned with the *interpretation* of artifacts, this emphasis on interpretation disguises a lack of attention given to the design stance in studies of *interaction*. Because of its emphasis on man-machine relations, a natural place to look for such work is the field of human-computer interaction (HCI). However, Dennett's stances—and especially his design stance—have attracted much less attention in the HCI field than might be expected. For example, there are only a few general HCI texts in which Dennett is mentioned, and in those texts it is typically his intentional stance which is emphasized.<sup>35</sup> Dennett's three stances are distinguished from each other in some more specific theoretical discussions,<sup>36</sup> where they are related to alternative categorizations of reasoning offered by Rasmussen,<sup>37</sup> Pylyshyn,<sup>38</sup> and Zuboff.<sup>39</sup> However, in none of these works is a concept like the design stance offered as a challenge to conventional ways of understanding how users might appraise or interact with systems.

Moving away from general HCI theory, Dennett's stances appear to be of most interest to those studying how humans interact with robots, animated characters, and other, seemingly sentient devices.<sup>40</sup> In particular, Terada and colleagues have conducted experiments to discern which stances people adopt when responding to different types of robots,<sup>41</sup> artifacts,<sup>42</sup> and entities.<sup>43</sup> In these laboratory-based studies, the researchers applied verbal and non-verbal self-report techniques to elicit the stances that users adopted with respect to the systems they interacted with or observed. Although all three of Dennett's stances were considered (and ostensibly revealed), Terada and colleagues interpreted the design stance as simply requiring consideration of a system's function, rather than as requiring the attribution of intentions to the system's creator. Their perspective is therefore fundamentally different from that developed in this article, but in any case, it is actually the user's adoption of the intentional stance that they are promoting.

While HCI robotics promotes the intentional stance, there is work in HCI semiotics that seems to promote something like the design stance, albeit without reference to Dennett. In an independent argument, de Souza says that technology users may recognize that they are not interacting with autonomous machines, but with the product of a rational human mind.<sup>44</sup> This recognition allows users to interact with technology by exploiting their expectations about the intellectual and creative behavior of other people—the designers. In this sense, de Souza views the designed system as a designer-to-user message, the meaning of which is: "Here is my [the designer's] understanding of who you [the user] are, what I've learned you want or do, in which preferred ways, and why."<sup>45</sup> de Souza and Leitão thus propose that designers follow a process of "semiotic engineering,"

- 27 Crilly et al., "Design as Communication;" Kevin Malkewitz, Peter A. Bibby, and Marian Friestad, "Persuasion by Design: the State of Expertise on Visual Influence Tactics," in *Persuasive Imagery: a Consumer Response Perspective*, ed. Linda M. Scott and Rajeev Batra (Mahwah, NJ: Lawrence Erlbaum and Associates, 2003), 3–15; Thomas J. L. Van Rompay, "Product Expression: Bridging the Gap Between the Symbolic and the Concrete," in *Product Experience*, ed. Hendrik N. J. Schifferstein and Paul Hekkert (San Diego, CA: Elsevier, 2008), 333–51.
- 28 Douglas Rushkoff, *Coercion: The Persuasion Professionals and Why We Listen to What They Say* (London, UK: Little Brown, 2000).
- 29 Marian Friestad and Peter Wright, "The Persuasion Knowledge Model: How People Cope With Persuasion Attempts," *Journal of Consumer Research* 21 (1994): 1–31; Amna Kirmani and Margaret C. Campbell, "Taking the Target's Perspective: The Persuasion Knowledge Model," in *Social Psychology of Consumer Behavior*, ed. Michaela Wänke (New York, NY: Psychology Press, 2009), 297–316; Linda M. Scott, "The Bridge From Text to Mind: Adapting Reader-Response Theory to Consumer Research," *Journal of Consumer Research* 21:3 (1994): 461–80.
- 30 Alvin I. Goldman, "The Psychology of Folk Psychology," *Behavioral and Brain Sciences* 16:1 (1993): 15–28; Stephen P. Stich and S. Nichols, "Folk Psychology," in *The Blackwell Guide to Philosophy of Mind*, ed. Stephen P. Stich and Ted A. Warfield, Blackwell philosophy guides 10 (Oxford, UK: Blackwell, 2003), 235–55. Dennett explicitly relates his work to such ideas. Dennett, *The Intentional Stance*, 8–11 and Chapter 3.
- 31 Lee Ross, "The Intuitive Psychologist and His Shortcomings: Sistortions in the Attribution Process," in *Advances in Experimental Social Psychology: Volume 10*, ed. Leonard Berkowitz (New York, NY: Academic Press, 1978).



- 32 Joshua Knobe, "The Concept of Intentional Action: a Case Study in the Uses of Folk Psychology," *Philosophical Studies* 130:2 (8, 2006): 203–31. Note that this folk psychology is used in the intentional stance just as some form of naïve physics is used in the physical stance. Patrick J. Hayes, "The Second Naive Physics Manifesto," in *Readings in Qualitative Reasoning About Physical Systems*, ed. Daniel S. Weld and Johan De Kleer (San Francisco, CA: Morgan Kaufmann Publishers, 1989), 46–63.
- 33 Peter Kroes, "Technological Explanations: the Relation Between Structure and Function of Technological Objects," *Philosophy and Technology* 3:3 (1998): 18–34.
- 34 For example, see Barrett, et al. "Artifacts and Original Intent," Margaret Anne Defeyter and Tim P. German, "Acquiring an Understanding of Design: Evidence from Children's Insight Problem Solving," *Cognition* 89:2 (2003): 133–55; German and Johnson, "Function and the Origins of the Design Stance," Kelemen and Carey, "The Essence of Artifacts: Developing the Design Stance."
- 35 For example, see John M. Carroll, ed., *HCI Models, Theories, and Frameworks* (San Francisco, CA: Morgan Kaufmann, 2003); Terry Winograd and Fernando Flores, *Understanding Computers and Cognition: a New Foundation for Design* (Norwood, NJ: Ablex, 1986).
- 36 David Benyon and Dianne Murray, "Adaptive Systems: from Intelligent Tutoring to Autonomous Agents," *Knowledge-Based Systems* 6:4 (1993): 197–219; Michael Lewis, "Designing for Human-Agent Interaction," *AI Magazine* 19:2 (1998): 67–78; Peter Pirulli, *Information Foraging Theory: Adaptive Interaction with Information* (Oxford, UK: Oxford University Press, 2007).
- 37 Jens Rasmussen, *Information Processing and Human-Machine Interaction* (New York, NY: North-Holland, 1983).
- 38 Zenon W. Pylyshyn, *Computation and Cognition: Toward a Foundation for Cognitive Science* (Cambridge, MA: MIT Press, 1984).
- 39 Shoshana Zuboff, *In the Age of the Smart Machine: the Future of Work and Power* (Oxford, UK: Heinemann Professional, 1988).

which can guide users toward inferring the design rationale from which the system results.<sup>46</sup>

Although work on semiotic engineering has suggested that something like the design stance is adopted by users, the focus of that work is quite different from what is proposed here. First, semiotic engineering originates in linguistics, and the interfaces to which it has been applied predominantly use conventional symbols in the form of verbal instructions, menu lists, and graphical icons. Second, this attention to explicit communication leads to asking questions primarily about *voice*: Who is seen to be saying what to whom? Third, it is the designer who is emphasized, including the messages that the designer can send and the interpretations that the designer can encourage. Consequently, there is no focus on how users might respond to interfaces that are less explicitly communicative (e.g., physical interfaces), and the reported qualitative studies do not reveal that users have some conception of the designer.<sup>47</sup> Therefore, although semiotic engineering promotes the idea that users adopt something like the design stance, it is actually that this idea is assumed; it is not elaborated on or investigated directly.

The idea that users adopt the design stance, and that this should be encouraged, stands in opposition to the work of researchers who have focused on "the media equation," a theory which proposes that people respond to media (e.g., computers) in a manner equivalent to how they respond to people. For example, in considering how people orient to sources, Reeves and Nass assert that consumers do not think of advertisers (but compare this with modern marketing theory),<sup>48</sup> and that computer users do not consider computer programmers.<sup>49</sup> To test this theory, Sundar and Nass conducted an experiment in which one group of participants interacted with computers that were labeled and referred to as "Computer," and another group interacted with computers that were labeled and referred to as the work of a "Programmer." Because the researchers found clear differences in how the different participant groups appraised the computers, they concluded that "humans working with a computer are not orienting to an unseen programmer but instead are interacting with the computer as a distinct social actor."<sup>50</sup>

It is in explicit opposition to Dennett that proponents of the media equation claim that users do not normally consider designers during interaction. However, these researchers do acknowledge that users think about the designer of the system when things go wrong, and that these thoughts are useful when reasoning about how to put things right.<sup>51</sup> Their experimental results might thus be reinterpreted as suggesting that when users adopt the design stance, this changes their experience of the systems with which they are interacting. They report that this change in experience led users to consider the system as being less friendly, less playful, and less effective.<sup>52</sup> However, the users in these studies were forced into adopting the design stance;

- 40 Terrence Fong, Illah Nourbakhsh, and Kerstin Dautenhahn, "A Survey of Socially Interactive Robots," *Robotics and Autonomous Systems* 42:3 (2003): 143–66; Akira Ito and Kazunori Terada, "Producing Intentionality in Eye-Contact Robot," in *11th International Conference on Human-Computer Interaction* (presented at the HCI International, Las Vegas, NV, 2005), 22–7; Zsófia Ruttkay and Rieks op den Akker, "Affordances and Cognitive Walkthrough for Analyzing Human-Virtual Human Interaction," in *Verbal and Nonverbal Features of Human-Human and Human-Machine Interaction*, ed. Anna Esposito et al., vol. 5042 (Berlin, Germany: Springer-Verlag, 2008), 90–106; Noriko Suzuki, Yugo Takeuchi, Kazuo Ishii, and Michio Okada, "Effects of Echoic Mimicry Using Hummed Sounds on Human-Computer Interaction," *Speech Communication* 40:4 (2003): 559–73; Karim A. Tahboub, "Intelligent Human-Machine Interaction Based on Dynamic Bayesian Networks Probabilistic Intention Recognition," *Journal of Intelligent & Robotic Systems* 45:1 (2006): 31–52.
- 41 Kazunori Terada, Takashi Shamoto, Haiying Mei, and Akira Ito, "Reactive Movements of Non-Humanoid Robots Cause Intention Attribution in Humans," in *Proceedings of the 2007 IEEE/RSJ International Conference on Intelligent Robots and Systems* (San Diego, 2007), 3715–20.
- 42 Kazunori Terada, Takashi Shamoto, and Akira Ito, "Human Goal Attribution Toward Behavior of Artifacts," in *Robot and Human Interactive Communication, 2008. RO-MAN 2008. The 17th IEEE International Symposium on* (Munich, Germany, 2008), 160–5.
- 43 Kazunori Terada, Kouhei Ono, and Akira Ito, "Detecting Underlying Stance Adopted When Human Construe Behavior of Entities," in *Proceedings of Advances in Robotics* (presented at the FIRA RoboWorld Congress 2009, Incheon), (Korea: Springer-Verlag, 2009), 5–12.
- 44 Clarisse Sieckenius de Souza, "The Semiotic Engineering of User Interface Languages," *International Journal of Man-Machine Studies* 39:5 (1993): 753–73.

nothing had gone wrong, and users were not reasoning about how to put things right. Questions remain over what circumstances might promote the spontaneous adoption of the design stance, and what effects the design stance might have under these circumstances.

### The Design Stance in User-System Interaction: an Account

To explore how the design stance might be adopted and what possible effects its adoption might have, what follows is a detailed hypothetical account of an interaction episode. The account permits easy reference to a concrete example and conveniently covers a number of different aspects of the design stance within one extended episode. Although a single comprehensive account of this sort may be difficult to achieve empirically, the expectation is that individual components of such an account could be generated through experimental, observational, or self-report methods.<sup>53</sup> In the account, a user (called Ursula) adopts the design stance as she reasons about the location of a control within a motor car. The paragraphs are numbered to permit later analytic commentary on specific incidents in the overall episode.

1. A friend of ours, Ursula, doesn't own a motor car but has hired one for the weekend so that she can visit her family. Once her journey has started, the weather becomes increasingly overcast, and when a light drizzle starts up, the windshield wipers are soon required. Ursula, who used to own some other brand of car, instinctively reaches for the wrong control and activates the turn signals instead of the wipers. In doing so, she experiences some frustration as she wonders why these things can't be the same for each car model. As Ursula continues along the busy road, the gusts from passing trucks mean that the windshield requires regular wiping and regular spraying from the washer nozzles.

2. Ursula's rental car had not received a proper service before being rented out to her, and it soon runs out of windshield washer fluid. The car and the washer system are now brought to our friend's attention as she pulls into a service station to fill the washer reservoir. Not seeing any convenient source of water that could be used to fill the reservoir, Ursula decides to buy some bottled water from the service station. Looking for a large bottle of water in the refrigerator, she is struck for the first time by the motifs of purity that adorn the bottles. The pictures of mountains and streams stand in stark contrast to the image that she has of her future self pouring this expensive water into the car's washer reservoir.

3. Once back at the car, Ursula sits down in the driver's seat to activate the hood release mechanism. She reaches under the steering wheel to feel about for the lever that she expects to find there, but she doesn't find it. Ursula swings her head down to the side to get better a look at the situation and is confronted with a smooth, featureless panel. She sits back up and looks quizzically at the dashboard, examining each of the switches and their associated

symbols. She vaguely expects that one of these switches will have a little pictogram of a car with its hood open, but none of them do. Becoming frustrated, Ursula opens the glove compartment to find the owner's manual for the car, but the manual is missing.

4. During her time looking for a lever, a switch, or a symbol, Ursula mutters things like "where is it?," "where can it be?," and finally "where have they put it?" Ursula has now looked in all the places that she expected the control to be, all the places that she thought it plausibly could be, and has now started to think about where some unspecified agent (the "they") could or would have placed it. Ursula starts hopelessly flipping down the sun visors to see what's behind them but mutters "no... they wouldn't have put it there," and as she opens the glove compartment again to search for the lever, she says, more emphatically "oh, that's ridiculous, I can't have been expected to look in here!" Thinking about where they could possibly have thought she'd look, Ursula next examines the space between the front seats and the space between the driver's seat and the door. Neither approach is successful.

5. Feeling that she has exhausted the possibilities inside the car, Ursula steps outside. She peers at the front of the hood but sees only a lip to pull up on, with no obvious catch or switch to release it. The only prominent detail is the badge that marks the brand of the car, a badge that is covered, like the rest of the car, in a thin layer of road spray. "It could be a button..." she says, but even as she reaches toward it, she hesitates, thinking "...but it gets so filthy; they couldn't have wanted me to touch that." As she pushes on the badge it doesn't move in, but it does feel loose. She presses it again, and as it pivots slightly upward, she shifts the direction in which she applies her force; the badge now swings cleanly out of the way, revealing the keyhole that opens the hood.

6. With the keyhole now exposed, Ursula is relieved to have found her way in and also irritated that she had to search for so long. This irritation is diffuse, directed partly at the car, partly at herself, and partly at those responsible for the system. As Ursula twists the key in the lock, she notes that she's never had to use a key to open the hood before, but reasons that without the key, the hood wouldn't be secure. "That's clever!" she says, as she considers the problem that someone must have solved and as she recognizes that the car badge stops the keyhole from getting too dirty. With the hood now open, the remainder of the refill procedure proceeds without incident, and Ursula is soon back on her way, with this episode now thankfully behind her.

### The Design Stance in User-System Interaction: a Commentary

The preceding account relates to the design stance in various ways. To illustrate this, the following analytic commentary considers each stage of the episode in turn, using paragraph numbers that correspond to those used in the account.

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- 45 Clarisse Sieckenius de Souza, *The Semiotic Engineering of Human-Computer Interaction* (Cambridge, MA: The MIT Press, 2005), 25.
- 46 Clarisse Sieckenius de Souza and Carla Faria Leitão, *Semiotic Engineering Methods for Scientific Research in HCI* (San Francisco, CA: Morgan & Claypool Publishers, 2009), 101; also see Donald A. Norman, "Design as Communication," 2004, [http://www.jnd.org/dn.mss/design\\_as\\_comun.html](http://www.jnd.org/dn.mss/design_as_comun.html) (accessed September 10, 2010).
- 47 de Souza and Leitão, *Semiotic Engineering Methods for Scientific Research in HCI*, 85–6.
- 48 Kirmani and Campbell, "Taking the Target's Perspective."
- 49 Byron Reeves and Clifford Nass, *The Media Equation: How People Treat Computers, Television and New Media Like Real People and Places* (Cambridge, UK: Cambridge University Press, 1996). Also see Clifford Nass and Youngme Moon, "Machines and Mindlessness: Social Responses to Computers," *Journal of Social Issues* 56:1 (2000): 81–103.
- 50 S. Shyam Sundar and Clifford Nass, "Source Orientation in Human-Computer Interaction," *Communication Research* 27:6 (2000): 693–4.
- 51 Reeves and Nass, *The Media Equation*, 188.
- 52 Sundar and Nass, "Source Orientation in Human-Computer Interaction," 693.
- 53 For example, see review in Sasse, "Users' Models of Computer Systems"; Gerrit C. van der Veer and Maria del Carmen Puerta Melguizo, "Mental Models," in *The Human-Computer Interaction Handbook: Fundamentals, Evolving Technologies and Emerging Applications*, ed. Julie A. Jacko and Andrew Sears (Mahwah, NJ: Lawrence Erlbaum Associates, Inc., 2002), 52–80.

1. Ursula's first reported awareness of the car is when she experiences some mild frustration over the differing placement of the controls in different car models. In activating the wrong control, she has become aware of an undesirable situation (variation in control placement across models) and has imagined some preferable alternative (standardization). Had she continued to reflect on this matter, she might have reasoned about why things are the way they are (perhaps constructing some historical cause) and imagined how change might be brought about (perhaps imagining some system of legislation or incentive). If these thoughts brought design—both its failings and its potential—into Ursula's awareness, this would increase the likelihood of her adopting the design stance in future interactions with technology.

2. In purchasing water to fill up the washer fluid reservoir, Ursula notices the motifs of purity on the bottles in a way that she has not done before. The use to which she is about to put the water makes the packaging features incongruous and thus conspicuous. Just as the accidental activation of the turn signal control brought the car to her attention before, the rhetoric of the bottle design is now more prominent than it would otherwise have been. If Ursula had reflected on this further, she might have identified why those features are present, considered the effect that they have on consumption choices, and judged the extent to which this marketing approach is acceptable. However, perhaps as with the matter of the control placement, she is at this moment too distracted by other things and insufficiently motivated to consider this issue in greater depth right now.

3. Because Ursula has to locate the lever for the hood, she first looks where her previous experiences direct her to look—perhaps without being fully aware of what she is doing. When this approach proves unsuccessful, Ursula then looks in the places where she expects the control might reasonably be. This move could involve something like the physical stance; a mechanical connection between the lever and the hood is tacitly assumed, and therefore the lever is expected to be close to the hood. Searching based on prior experience and on reasoning about the system's operation is unsuccessful, but this repeated failure serves to bring the system prominently into Ursula's consciousness and prompts her to adopt some other strategy.

4. In Ursula's frustrated mutterings, we finally see our first clear evidence that the design stance has been adopted. In saying "*where have they put it?*" Ursula reveals her awareness that certain agents ("*they*") are responsible for the system with which she is interacting, and that those same agents have taken actions ("*put*") that have determined the location of the control she seeks. In saying, "*I can't have been expected to look in here!*" Ursula further reveals her awareness that these same agents would have thought about her need to find the control and that they would have held some

image of how that control would be sought. Ursula has now shifted from a physical stance to a design stance: She is reasoning about the plausible location of the control on the basis of some imagined agent's expectations of her own actions.

5. Ursula's reasoning about the agent's reasoning is most evident when she hesitates to touch the car's badge. Ursula here sensibly anticipates that the agent would not have wanted her to unnecessarily interact with some predictably dirty part of the car. Ursula here attributes a user-centered perspective to the agent, and in doing so she almost misses her opportunity to locate the opening system for the hood. The design stance here works against Ursula because the image she has formed of the agent and the design process is incomplete. Without knowing all of the motivations and constraints that the agent was driven by, Ursula might overlook a broad range of technical, economic, and aesthetic influences.

6. With the opening system located, Ursula's experience of the car (and her reflection on that experience) is influenced by the image of the agent that she has now developed. Her frustration and disappointment are aimed not just at the car as an inanimate object or at herself as an uninformed user, but also at the agents responsible for the car and its design. Her experience is not all negative though; as she reasons about the explanations for some of the system's features, she gains satisfaction from feeling that her security and her convenience have been considered. Ursula now sees the implementation of the lock and its cover as resulting from the concerns of a human agent who has tried to solve problems on her behalf.

## Discussion

In addition to the particular sequence of events considered in the commentary above, Ursula's interaction episode points to three general sets of issues that warrant discussion here: First, there are issues of what factors prompt the adoption of the design stance; second, issues of whether it must really be a designer that is imagined; and third, issues about what knowledge of design users actually have. We shall now consider each of these issues in turn before reflecting on how such matters fit with the developing literature on design and interaction.

In the example with the car, our user is placed in a situation where her expectations have been confounded, and yet she is highly motivated to determine the location of the control. The car and its design have thus become salient in a way that they might not have otherwise. This idea of heightened awareness can be seen as an extension of Heidegger's distinction between *ready-to-hand* and *present-at-hand*,<sup>54</sup> a distinction that is commonly made in discussions of interaction.<sup>55</sup> In this view, a system is seemingly non-existent to users (*ready-to-hand*) when they are focused on the work to be done, but the system becomes salient (*present-at-hand*) when some "break-down" occurs. The design stance takes this progression

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54 Martin Heidegger, *Being and Time* (Malden, MA: Blackwell, 1962, trans.).

55 For example, see Paul Dourish, *Where the Action is: the Foundations of Embodied Interaction* (Cambridge, MA: MIT Press, 2001); Winograd and Flores, *Understanding Computers and Cognition*.

further and suggests that this present-at-hand condition can also lead the user to become more conscious of the designer's actions. In this sense, we might expect that the design stance is more likely to be adopted when a system is prominent in the user's mind, whether because of interest, surprise, or frustration.

Our user is not explicitly invoking some image of a designer, but rather some diffuse and non-specific agent, "they." This agent is somehow taken to be responsible for how the system is, is assumed to have had some choice over how the system works, and is thought to have considered how the system might be used. From an external perspective, this might sound like the role of a designer, but the user need not necessarily assign that label to the agent. Users might recognize that systems result from various motivations and constraints, even if they do not explicitly consider these to be design issues.<sup>56</sup> Therefore, the design stance is best considered as an analytic perspective on user-system interaction, rather than as a description of how that interaction is necessarily conceptualized by the person involved.

Our user's adoption and implementation of the design stance is influenced by the knowledge she holds of what might generally be called "design," even if she would not necessarily use that term. This knowledge need not be founded on reliable sources, but might be composed of suspicions, rumors, misinformation, and various ideas from popular culture. As users modify the systems they use, and as they devise workarounds and fixes for the systems' deficiencies, they are themselves involved in design activities, and so they also learn about design by doing it.<sup>57</sup> Design knowledge might thus be incomplete, inconsistent, and dynamic, as hints and fragments of information are pieced together over time from different sources. In this sense, knowledge of design is assembled and developed through the course of people's lives and might be influential, even if it is inaccurate.

## Conclusion

In the opening pages of *The Intentional Stance*, Dennett says that "Philosophy does not often produce stable, reliable 'results' the way science does at its best. It can, however, produce new ways of looking at things, ways of thinking about things, ways of framing the questions, ways of seeing what is important and why."<sup>58</sup> In line with this suggestion, this article has taken Dennett's own concept of the design stance as a starting point for considering how users might respond to and interact with designed systems. A strong version of that concept requires the inference of design intent, and a broad version considers the influence that this exerts on experience, as well as interaction. Interpreting the design stance in this way offers a new perspective from which user behavior might be viewed and from which designed systems might be analyzed. Such a perspective fits with recent work on design and interaction—work that has opened

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56 Martin Woolley, *Design, Product Identity and Technological Innovation* (PhD Thesis: Sheffield City Polytechnic, 1983); M. Woolley, "A Comparison of Design and User Perceptions," in *Objects and Images: Studies in Design and Advertising*, ed. S. Vihma (Helsinki, Finland: University of Industrial Arts, Helsinki, 1992): 76–85.

57 Jodi Heintz Obradovich and David D. Woods, "Users as Designers: How People Cope with Poor HCI Design in Computer-Based Medical Devices," *Human Factors* 38:4 (1996): 574–92; Pieter E. Vermaas and Wybo Houkes, "Technical Functions: a Drawbridge Between the Intentional and Structural Natures of Technical Artefacts," *Studies in History and Philosophy of Science* 37:1 (2006): 5–18.

58 Dennett, *The Intentional Stance*, 2.

up to consider the full richness of human experience. With a more sophisticated understanding of users now gaining ground, the way seems well prepared for acknowledging that they can recognize themselves as being users and can anticipate that designers have designed systems with them in mind. Exploring the implications of users adopting such a stance has the potential to expand and refine our basic understanding of user-system interaction.

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# “The ‘Designer’—The 11th Plague”: Design Discourse from Consumer Activism to Environmentalism in 1960s Norway

Kjetil Fallan

In 1962, designers were branded as fadmongers and named the Plague itself by a Norwegian botany professor who took it upon himself to defend the duped consumer. In 1969, design students under the guidance of Victor Papanek and his Norwegian host were renovating a derelict backyard in a run-down part of Oslo in the name of environmental regeneration. These two rather remarkable, but highly dissimilar events exemplify a significant transformation in critical design discourse in Norway during the 1960s. Whereas the broader streams of design discourse at the time revolved around the disintegration of the traditional applied art movement in the aftermath of the Scandinavian Design frenzy,<sup>1</sup> these more radical factions sought to drive design out of its comfort zone established in the prosperous postwar period.

This article explores how the more radical components of design ideology that slowly gained momentum throughout the 1960s now and then came to the fore in the Norwegian design community. In various and not always coherent ways, petitions were made for increased attention to the social and moral responsibility of design. Nevertheless, a discernable shift in focus in the course of the decade can be identified: In the early 1960s, critical design discourse aligned with consumer activism, campaigning for product longevity and against faddishness, whereas ideas associated with ecology, resource management, and environmentalism emerged as the most pressing topics toward the end of the decade.

At the risk of slightly anticipating events, one might say that this criticism questioned what design for the *real* world would entail. The critique arose both within and outside the design profession. Some outsiders pigeon-holed design and designers as immoral minions of capitalism and catalysers of consumption. At the same time, a small but vocal group of insiders engaged in serious soul-searching, questioning established practice in the profession. One of the more interesting expressions of these radical design ideals came with the declaration from a young design educator that “We have teacups enough!”—conveying a (symbolic, if not actual) break with the applied art movement and its devotion to *more beautiful everyday goods*.

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1 Kjetil Fallan, “How an Excavator Got Aesthetic Pretensions: Negotiating Design in 1960s’ Norway,” *Journal of Design History* 20:1, 43–59.



- 2 Knut Fægri, "Designeren"—den 11. Landeplage," *Farmand* 13 (1962): 22–3.
- 3 Following the lecture, a professor of theology at the Norwegian Lutheran School of Theology reported Øverland, and he was subsequently charged with blasphemy. The trial, however—where Øverland acted as his own counsel—resulted in a full acquittal. See: Arnulf Øverland, "Kristendommen, den tiende landeplage," in Arnulf Øverland, *Tre foredrag til offentlig forargelse* (Oslo: Fram, 1933): 7–34. Øverland's essay even made it into the fictional work of fellow writers. An intriguing example is how the equally controversial author, Agnar Mykle, let the protagonist of his novel *Lasso rundt fru Luna* "reel... about a week on end in the most intense ecstasy" after having read "Kristendommen, den tiende landeplage." Agnar Mykle, *Lasso rundt fru Luna* (Oslo: Gyldendal, 1954): 45.
- 4 Fægri, *Op.cit.* 23.
- 5 *Ibid.*

### The Design Plague

In Spring 1962, on the pages of the business magazine *Farmand* appeared an article titled "The 'Designer'—the 11th Plague" ("Designeren"—den 11. Landeplage).<sup>2</sup> The article was authored by Knut Fægri, a professor of botany at the University of Bergen. Both the author and the venue were thus outside the remit of the design community, but the nature of the allegations made commanded its attention nonetheless. Adding to the provocative force of Fægri's criticism was his choice of title: a paraphrase of the title of a famous and much disputed lecture given by the poet Arnulf Øverland at the Norwegian Students' Society in 1931 called "Christianity, the Tenth Plague"—an incident causing much public commotion and even ending up in court on a blasphemy charge.<sup>3</sup>

Why, then, did the botany professor consider the designer a plague? Fægri's tirade was occasioned by a personal frustration with the discontinuance in 1960 of the production of the Porsgrund Porselænsfabrik oven-to-table set *Glohane*, designed by Tias Eckhoff in 1955 (see Figure 1). The decision ended possibilities of supplementary purchases, and Fægri poured out his wrath in several directions: (1) toward consumers, for "not appreciating the difference between buying a service and buying a summer hat;"<sup>4</sup> (2) toward the manufacturers, for constructing consumption ("If they can get the summer hat mentality sufficiently inculcated, one might reach the point where people scrap their tableware once a year in order to follow the 'designer' fashion. Then we'll be talking sales.");<sup>5</sup> and (3) toward the media for being completely uncritical and full of awe in relations with the designers and thus failing the mission to guide and counsel the public on matters of consumerism.

However, as the title clearly announces, Fægri's primary target was the designers—who he consistently referred to as "designers," effectively exploiting the derogatory potential of the quotation marks:

Figure 1  
Dish w/lid from the oven-to-table range "Glohane" manufactured by Porsgrund Porselænsfabrik (1955), designed by Tias Eckhoff. Courtesy of the National Museum of Art, Architecture and Design. Photographer Anne Hansteen Jarre.



The task of the “designer” is to produce new forms, and the worst thing that could possibly happen to him is that he produces a truly good, permanent form: what is he then to do the rest of his life? ... The “designers” must demonstrate that they are indispensable: exit *Glohane*, damn the customers, they are always without rights. And next time, the customers say damn Norwegian crockery, let us stick to foreign standard designs, those we can at least find again.<sup>6</sup>

The crux of Fægri’s criticism was thus that the designers were self-asserting, egocentric, and cunning opportunists, turning everything they laid their hands on into ephemeral fashion products, while also being utterly servile to and uncritical of the manufacturers’ immoral and irresponsible perpetual novelty pursuit. The flaw that could be—and indeed was—observed in Fægri’s argument, though, was the degree to which he empowered his enemy: He seemed to believe that the designer made the decision to discontinue the manufacture of a product—if not directly then at least indirectly, by way of new designs making existing products (appear) obsolete.

Both the former sales manager of Porsgrund Porselænsfabrik, Viggo B. Heirung,<sup>7</sup> and the director, Jacob Aall Møller, felt compelled to lecture the botanist on the realities of industrial manufacture: The discontinuance of *Glohane*, they both proclaimed, had nothing to do with the product’s design, nor did it result from new designs taking its place; instead, it was a question of manufacturing capacity.<sup>8</sup> In response, Fægri simply adjusted his aim slightly and claimed that these explanations did not change anything. The manufacturers had to appreciate that launching a product entailed responsibilities and that discountenances and short production lives was a deceitful and immoral practice.<sup>9</sup> Aall Møller concurred with Fægri that the perpetual quest for novelty was a nuisance but blamed it on a frivolous and irresponsible public. The designer just did his job the best he could, concluded the director, with a plea: “Professor Fægri, let the designer off the hook!”<sup>10</sup>

Even the designer—*Glohane*’s designer, Tias Eckhoff, at that—agreed that we have ...been bestowed with a disturbing quest for novelty. The porcelain follows the ever more rapid changes in fashions; the models’ production lives seem to be getting shorter and shorter. The manufacturers must sell and the pressure for novelties rises as the product must be adapted to the broad market. The result is that one often ends up in quaintness. Both form and decor become mannered.<sup>11</sup>

Although Eckhoff had left his position as design manager at Porsgrund in 1959, it seems he agreed with his former colleagues Heirung and Aall Møller that this deplorable situation could not be blamed on manufacturers or designers: Washing their hands of

6 Ibid., 22.

7 Heirung was sales manager at Porsgrund from 1954 to 1959, when he moved back to his native Trondheim to manage the tableware retail company Andreas Moe, selling *Glohane* and other Porsgrund products. One of his tasks at Porsgrund had been to come up with names for all the factory’s products, among them *Glohane*. Viggo B. Heirung in conversation with the author, October 14, 2005.

8 Viggo B. Heirung, “‘Designeren’—den 11. Landeplage,” *Farmand* 15, 1962, 63 and Jacob Aall Møller, “‘Designeren’—den 11. Landeplage,” *Farmand* 17 (196): 3–5. *Glohane* was not manufactured at Porsgrund Porselænsfabrik, but at the sister company A/S Sanitærporsele, maker of sanitary ware, where it had been baked between that factory’s usual production bakings of toilets and sinks to fill spare capacity. This spare capacity vanished as A/S Sanitærporsele experienced an increase in demand for its core products. Because of differences both in material and baking, the production could not be moved to Porsgrund Porselænsfabrik.

9 Knut Fægri, “Glohaner og knehøner,” *Farmand* 18 (1962): 31–2.

10 Jacob Aall Møller, “Glohaner og knehøner,” *Farmand* 20 (1962): 75.

11 Tias Eckhoff interviewed in Ragnhild Bjelke, “Vurder ikke dekoren isolert,” *Bonytt* 27 (1967): 213.

the responsibility Fægri assigned to them, they held the whimsical consumers and their uncultivated taste responsible for the development.

By this time, the criticism accusing designers of continuously supplying manufacturers with novel designs for the sake of novel designs appeared from several quarters. Fægri's accusations resembled those of other independent critics who accused designers of unscrupulously serving the profit greed of industry and commerce, designing alluring, instant garbage.<sup>12</sup> Perhaps more surprising was when an industry representative, the economist Alf Midtbust, who served as director of the National Federation of Furniture Manufacturers, expressed similar attitudes. As in Fægri's case, a product Midtbust wished to purchase had been discontinued—this time an armchair known as *Kaminstolen*, manufactured by Aarnæs & Hjelm and designed by Adolf Relling in 1946.<sup>13</sup> As a representative of the industry, Midtbust understandably aimed elsewhere: The novelty-crazed public was an easy target for him as well. More interesting is his critique, however carefully worded, of the design community for being overly keen on experimenting. According to Midtbust, this attitude only complemented the consumers' desire for novelties and thus contributed to what he saw as a pressure on the manufacturers to constantly bring out something new.<sup>14</sup>

Returning briefly to Knut Fægri's contribution, the role of design and designers in the consumer society clearly was beginning to be questioned from several quarters, especially expressed as a concern for frivolous consumption and illegitimate novelty of design.<sup>15</sup> Still, there is reason to suspect that Fægri's criticism represented more than a vehement disgust for fashionism and novelty craze. As a botanist, he developed a strong interest in and passion for climatic studies, ecology, resource management, and the preservation of natural resources.<sup>16</sup> Although these dispositions were not explicit in the *Farmand* articles, we can plausibly suggest that his aversion to what he considered an increasingly ephemeral character of many products had other underpinnings as well. Indeed, if we interpret Fægri as implicitly linking consumer society and industrial design with ecology and resource management, his criticism surely becomes poignant.

As we have seen, Fægri was opposed by representatives of industry, who accused him of a poor understanding of the realities of commerce and industry, as well as of shooting the pianist. Because no designers had retorted, Arne Remlov, editor of the leading design magazine *Bonytt*, took it upon himself to speak on behalf of the profession. Remlov based his defense on the presumption that Fægri held an antiquated view of the design profession, reminding the professor that design was not just about the superficial form and color of an object. Also, the *Bonytt* editor displayed a far more positivistic attitude toward change than Fægri:

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- 12 Elias Cornell, "Lyx eller rikedom i våra hem," *Bonytt* 22 (1962): 154–6.
- 13 A curious fact is that this very chair—albeit with a slight redesign by Else and Nordahl Solheim—was reissued in 1965, although whether the decision was made based on Midtbust's "obituary" is dubious: Arne Remlov, "Vår mann i Stavanger," *Bonytt* 25 (1965): 258.
- 14 Alf Midtbust, "Nekrolog over en stol," *Bonytt* 23 (1963): 82–3 and Alf Midtbust, "Quo vadis?," *Bonytt* 24 (1964): 113. The *Bonytt* journalist Harriet Clayhills, who often portrayed herself as the consumer's advocate, also made similar arguments concerning what she claimed to be an "increasing frequency in the oscillations of the furniture fashion:" Harriet Clayhills, "Hold fast ved modellen....," *Bonytt* 24 (1964): 122.
- 15 Incidentally, this criticism was remarkably similar to the disgust the Norwegian design community a few years earlier had shown for the *styling* so prominent in American mainstream design of the 1950s: change for the sake of change, design used as commodity cosmetics. See, e.g., Thorbjørn Rygh, "Amerikansk Form," Thorvald Krohn-Hansen (ed.), *Nordenfjeldske kunstinstrimuseum—Årbok 1953* (Trondheim: Nordenfjeldske Kunstinstrimuseum, 1954) 14 and Jens von der Lippe, "Amerikansk virksomhet," *Bonytt* 14 (1954): 65.
- 16 Some of his publications may give an indication of this: Knut Fægri, "Klimahistorie og arkeologi," *Naturen* 10 (1942): 310–7; Knut Fægri, "Naturvern i mange land," *Naturen* 9 (1956): 515–31; and Knut Fægri and L. van der Pijl, *The Principles of Pollination Ecology* (Toronto: Pergamon, 1966).

Is it not ... natural and appropriate that [the designer] seeks to improve the items for which he is responsible? ... Generally one might say that reaching other results is a sign of greater knowledge, that it in other words is what we call development.<sup>17</sup>

The wheel kept on turning, Remlov argued; development was a good thing, and the designer was by no means the weak-willed marionette that Fægri claimed. On the contrary, Remlov asserted: The designer is an earnest and righteous professional with impeccable moral standards. A decent designer would never give in to modishness, but would only present designs representing genuine, uncompromised improvements.<sup>18</sup> With the benefit of hindsight, it is tempting to speculate whether Fægri's criticism perhaps would have fallen on more fertile soil had he made a more explicit link between commodity production and ecology and resource management—a connection environmentalist critics would highlight just a few years later.

### The Morality of Materials

In the meantime, a very different, but equally fascinating, take on the newfound concern for the contextual morality and responsibility of design took form as a growing propaganda for the use of indigenous materials. This message was most clearly expressed in the field of furniture design. It started out in the latter part of the 1950s as a modest critique of the proliferation of teak as the material of choice in furniture production. This early critique was based chiefly on the fear that the phenomenon resulted from the popularity of Danish furniture—the classical fear of fashion, one might say. But in the 1960s, teak was joined by other exotic types of wood (e.g., mahogany and rosewood) as targets of criticism, and now they were criticized, not for being a fad or a fashion, but for being alien, false, and extravagant in the realm of Norwegian furniture production.<sup>19</sup>

In 1965, the National Federation of Furniture Manufacturers issued a design competition for furniture in pine and birch, and the Norwegian furniture fair in Stavanger featured many of these designs, as well as other furniture in these materials.<sup>20</sup> *Bonytt* joined in and propagandized willingly and enthusiastically for the use of pine and birch, which could be found in abundance in the extensive Norwegian forests. Because these were indigenous materials, they were deemed “genuine,” “true,” “honest,” and “moral.” In other words, pine and birch were portrayed as “real” materials suitable for designing for the “real” world.<sup>21</sup>

In historicizing these aspects of the critical design discourse, we face a potential methodological fallacy: We must be careful not to extrapolate more recent ideas, such as sustainability and eco-design, back into the 1960s.<sup>22</sup> Still, this caution should not preclude a considerate interpretation of the new advocacy of indigenous materials as a possible expression of a more or less articulate concern

17 Arne Remlov, “Designerens ansvar,” *Bonytt* 22 (1962): 113.

18 Ibid.

19 See, e.g., Arne Remlov, “Fra det ene til det andre...,” *Bonytt* 26 (1966): 242.

20 Arne Remlov, “Fra Stavanger møbelmesse,” *Bonytt* 25 (1965): 274–6.

21 See, e.g., Alf Midtbust, “Frem for furua,” *Bonytt* 25 (1965): 126–7; Marianne Gullowsen, “Efterlyses...,” *Bonytt* 25 (1965): 139–40; Arne Remlov, “Det lyktes—så langt,” *Bonytt* 25 (1965): 221–4; and Arne Remlov, “Vår mann i Stavanger,” *Bonytt* 25 (1965): 252–8.

22 Clive Dilnot has demonstrated that many design histories have made this mistake of lapsing into retrospective constructions of traditions of contemporary ideas: Clive Dilnot, “The State of Design History, Part II” in Victor Margolin (ed.), *Design Discourse: History, Theory, Criticism* (Chicago: University of Chicago Press, 1989): 233–50. The many problematic aspects of such a practice—constructing a genealogical history of ideas that predates their full-fledged conceptualization—are discussed, for example, in Quentin Skinner, “Meaning and Understanding in the History of Ideas” in James Tully (ed.), *Meaning and Context—Quentin Skinner and His Critics* (Princeton, NJ: Princeton University Press, 1988): 29–67.

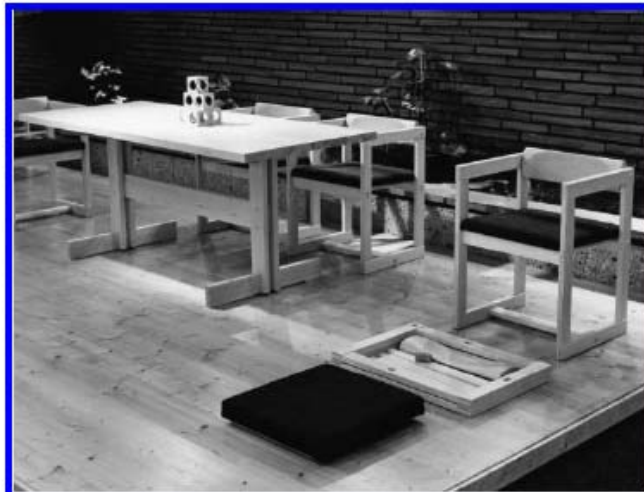
- 23 For more on Relling and the *Siesta* chair, see Fredrik Wildhagen, *Møbeldesigneren Ingmar Relling i perspektiv* (Sykkylven: Sykkylven næringsutvikling A/S, 1991).
- 24 Liv Schjødt, "Tordenskjolds soldater," *Bonytt* 26 (1966): 10–1.

for resource management in the context of product development and design processes. This campaign for genuineness and naturalness in the product development process can be seen as a reflection of the campaign for genuineness and naturalness in the appropriation and use of products, so explicit in the consumption critique discussed above. We might say that these two campaigns made up each end of the growing concern for the contextual morality and responsibility of design.

A telling case in this connection is the third design competition organized by the Furniture Industry's Trade Council in 1965. First prize was awarded to the *Siesta* easy chair, submitted by designer Ingmar Relling and the manufacturer Vestlandske Møbelfabrikk A/S. This remarkable product has been in production ever since and is one of the biggest successes ever to emerge from the Norwegian furniture industry.<sup>23</sup> In her comment on the competition, *Bonytt* co-editor Liv Schjødt reticently seconded the jury's decision; her real concern, however, was with a contribution that did *not* enthuse the jury.<sup>24</sup> The interior architect and furniture designer Edvin Helseth had been commissioned by Trysil Municipal Forest District to design a furniture system intended for manufacture by various local enterprises outside the established furniture industry. The motivation was to create viable business in rural districts, thus requiring low costs of investment, production, and material, and low skill requirements. Based on this program, Helseth designed chairs and tables made up of simple, modular elements based on standard plank profiles, each requiring minimal tooling, machining, and finishing (see Figure 2). The system highlighted ease of assembly, and the material was local pine.

Thus, these features were in line with the campaign for genuineness and naturalness, expressing on the production side the contextual morality and responsibility of design. But

Figure 2  
Modular system furniture in pine  
manufactured by Trysil Municipal Forest  
District (1965), designed by Edvin Helseth.  
Courtesy of the Norwegian Design Council.



Schjødt's enthusiasm was further fueled by her assessment of the furniture's functionality and usability aspects, falling in line with the consumption side of the same discourse: robust dimensions for longevity, rounded and flexible back rest for ergonomics, adjustable parts and particular nursery versions for child friendliness, arm rests below the table top for floor space economy, and low prices for affordability.<sup>25</sup> In other words, the design was considered an attempt to create a low-impact, high-yield product—a design for the “real” world.

Although Helseth's furniture system—dubbed *Trybo*—did not impress the jury of the Furniture Industry's Trade Council design competition, it later won approval elsewhere.<sup>26</sup> The system was expanded to include a vast range of furniture types when its manufacture began in 1966, and was also incorporated into the *Trybo* prefab, modular leisure cabin designed by Helseth and his colleague, the architect Hans Østerhaug—a project that was presented to an international public on the pages of the British Council of Industrial Design's *Design* magazine.<sup>27</sup> The Norwegian Design Centre jury used much the same arguments as Liv Schjødt had done in her ode to the Helseth furniture when they awarded *Trybo* the Norwegian Design Award for 1967:

The Trybo pine furniture shows originality and independent thinking and is an exceptionally good example of product development based on strictly limited raw materials and production facilities.<sup>28</sup>

This remark, combined with a commendation of the project's aspect of regional development and local industry integration, clearly indicated that this part of the industrial design community showed increased concern for the contextual morality and responsibility of design. Helseth himself explained his motivation for the project as based on a strong social vocation:

I believe ... that of greatest interest is the utility article which can be used by different persons with different needs, what I will call the social furniture, the aid ... The artifact must never become a goal in itself, but be thought of as part of a context.<sup>29</sup>

Hence, Helseth portrayed his design philosophy as a way of solving “real” problems for “real” people living in the “real” world. Design should serve humans and facilitate life—not create imposing objects of desire. Helseth later became involved in a project that was far more radical in this respect, when in the early 1980s he worked with the Norwegian Agency for Development Cooperation (Norad) on developing school furniture intended for production in Tanzania.<sup>30</sup> His revolt against what he in the 1960s saw as aestheticizing tendencies in contemporary Scandinavian furniture design made *Bonytt's* Harriet Clayhills label Helseth the *enfant terrible* of the

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- 25 Liv Schjødt, “Vi trenger hyttemøbler også!,” *Bonytt* 26 (1966): 12–3.
- 26 A very curious example of such approval is that a Dutch professor of industrial design visiting Norway bought a *Trybo* chair and included it in the model collection at Eindhoven Academy of Industrial Design and that the chair and Helseth were the subjects of an article appearing in the Benelux magazine, *Die Nieuwe*: N. N., “Norsk stol har suksess,” *Bonytt* 27 (1967): unpagged [app.] The *Trybo* furniture series was also selected for the exhibition, *Design in Scandinavia*, which toured Australia in 1968: Ulf Hård af Segerstad, *et al.* (eds.) *Design in Scandinavia* (Stockholm: Victor Pettersons Bokindustri AB, 1968): unpagged.
- 27 Alf Bøe, “Designed for leisure living,” *Design* 248 (1969): 32–4.
- 28 Alf Bøe, *Den norske Designpris de syv første år / The Norwegian Design Award its first seven years* (Oslo: Norsk Designcentrum, 1969): 52. This was the second time Helseth received the Norwegian Design Award. His module-based furnishing system for cupboards and drawer sections, *Modul 5–15*, won the 1963 edition. The jury considered it “a very praiseworthy attempt at simplifying and rationalising production, storage, and distribution.” 44.
- 29 Edvin Helseth, interviewed in Harriet Clayhills, “Bonytt-intervju om disiplin og tilpasning,” *Bonytt* 26 (1966): 260.
- 30 Knut Berg, Stephan Tschudi-Madsen, *et al.* (eds.), *Norsk kunstnerleksikon 2* (Oslo: Universitetsforlaget, 1983): 165.

design community. She depicted much Norwegian furniture design as becoming conformist, conservative, and pedantic: "But then you have the obstinate and insubordinate Edvin Helseth as a hair in the soup. He who does not want to make fine furniture."<sup>31</sup>

Still, the most unconventional Norwegian furniture to see the light of day in the 1960s must have been the pieces in plastic-reinforced cardboard designed by interior architect Terje Meyer. According to Meyer, the idea was to develop furniture that would be as cheap as possible, primarily aimed at young people. The solution was not to cut corners in conventional furniture production, but to think outside the box, the young designer proclaimed. After eagerly promoting his ideas in *Bonytt* in 1967, he managed to get a manufacturer on board.<sup>32</sup> And just as the material and concept were unconventional, so were the manufacturer and the retailer: The packaging manufacturer Strongpack A/S produced the cardboard furniture, and it was sold through the fancy boutique Bobolina in Oslo. Given that an arm-chair sold for NOK 40 (USD 7) and an easy chair for NOK 70 (USD 13), Meyer must be said to have reached his goal of making furniture "so cheap that they can be thrown away when you get tired of them."<sup>33</sup> Despite the very low prices, the cardboard furniture never became a big seller, and its production was soon discontinued.

How this disposable furniture fit in to the emerging debate on environmental awareness is another story, but Meyer did become involved in this debate when, shortly after, he participated in a project for the development of an electrical van. Meyer and fellow designer Bjørn A. Larsen were hired to design the fiberglass-reinforced polyester body of this peculiar, aluminum frame vehicle developed by Einar Kjelland-Fosterud and his fellow engineers. The project was funded by the Ministry of Industry, and environmental concerns were a prime mover in the project, in addition, of course, to industrial development. Three vehicles were built at Strømmens Værksted around 1970, but series production never came about.<sup>34</sup>

#### **"We have teacups enough!"**

Despite Helseth and Meyer's involvement in pioneer projects, it was another designer who, more than any other, would explicate the emerging interest in the potential of design as social activism within the profession. Roar Høyland developed a strong passion for the contextual morality and social responsibility of design from the mid-1960s—interests he had ample opportunity to express when he joined the *Bonytt* editorial committee in 1965 and, more significantly, began teaching design methodology at the National College of Art and Design in 1968. As an indication of this disposition, he was on the Norwegian Design Centre jury that hailed Helseth's *Trybo* furniture, discussed previously.<sup>35</sup> When interviewed by his *Bonytt* colleague Harriet Clayhills, he proclaimed with great pathos that "it is irresponsible to use design as a selling point for any given

31 Clayhills, *op.cit.*

32 Else Margrethe Engen, "Ung designer søker sin produsent," *Bonytt* 27 (1967): 218–9.

33 N. N., "Billige pappmøbler," *nye bonytt* 7 (1968): 33. A conventional easy chair in the lower price range cost about ten times as much. For instance, the *Siesta* chair manufactured by Vestlandske Møbelfabrikk and designed by Ingmar Relling, much applauded for its design for rational production and low shipment cost, was priced at NOK 805,- (USD 150,-) in 1968. Gerd Hennem, "Markedet: Tradisjonelt—moderne," *nye bonytt* 10 (1968): 44.

34 Einar Kjelland-Fosterud, "Den norske ELBIL" in Øistein Bertheau and Christian Stokke (eds.), *Made in Norway? Historien om forsøk på bilproduksjon i Norge* (Oslo: Norsk Teknisk Museum, 1991): 250–5.

35 The other jury members were Tormod Alnæs, Arne Lindaas, and Kaj Franck—with Alf Bøe as secretary: Bøe, *op.cit.* 51.

36 Roar Høyland interviewed in Harriet Clayhills, "'Design = Ekonomi' og kultur," *Bonytt* 25 (1965): 279.

sofa bed model.”<sup>36</sup> To Høyland, real design was a complex task not to be taken lightly. Social and human requirements should always be its motivation and guideline, but designers could only succeed in changing our environment and society by acknowledging that design also was a decidedly profane and worldly activity:

We must break free of regarding design as merely a drawing task. Technology and economy enter the picture, it is a question of analyses, tests and trials... The designer must, in collaboration with technicians, engineers, and economists, have a grounding on which to promote his ideas.<sup>37</sup>

Høyland thus seemed to envision the designer as a figure in which pietistic morals, social responsibility and aesthetic culture joined forces with rational thought, technological know-how and business instinct. In other words, he saw the designer as a great Renaissance Man—much like a hybrid of John Calvin and Leonardo Da Vinci, slightly genetically enhanced by contribution from Karl Marx. Another important point for Høyland was to purge design of its snobbish and elitist tendencies. The designers should engage in projects aiming to solve “real” problems for “real” people living in the “real” world. The cultural and social influence of a product was proportional to its affordability, proliferation, and number and frequency of product-user interactions. Thus, improving the design of a milk carton was, according to Høyland, much more important than to design yet another beautiful and expensive chair.<sup>38</sup>

This attitude can be said to have reached its zenith when Høyland in 1968 hung a poster in his classroom at the National College of Art and Design that said “We have teacups enough!”<sup>39</sup> In other words, designers had more pressing tasks at hand. This highly symbolic act may be seen as an attempt at a final showdown with the old Paulssonian idea of *more beautiful everyday goods* (*vackrare vardagsvara*), which for half a century had been such a dominant idiom in Scandinavian design.<sup>40</sup> The irony is that the act took place the very year the Norwegian Applied Art Association celebrated its fiftieth anniversary and the National College of Art and Design celebrated its hundred and fiftieth anniversary—a school that had been the breeding ground for the applied art movement in Norway. Two decades later, Høyland even became Rector of the school.<sup>41</sup>

While Høyland encouraged design activism and social responsibility from within the profession, similar attitudes also began to appear in design criticism authored by non-designers. The art historian and writer Gerd Hennum, who occasionally freelanced for *Bonytt*, announced a remarkably radical stand on the social and political responsibilities of design when she interviewed the young American designer, Edward Hubbard Yonkers, and titled the article, “Design—A Wealth Phenomenon in the Rich Part of the World.” Yonkers, a graduate of the Institute of Design at Illinois

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37 Ibid., 278–9.

38 Ibid., 277–82.

39 Roar Høyland in conversation with the author, March 28, 2007.

40 The term was coined by the Swedish art historian Gregor Paulsson in 1919. Gregor Paulsson, *Vackrare Vardagsvara* (Stockholm: Svenska Slöjdföreningen, 1919).

41 Høyland headed the school’s metal department from 1983 to 1989 and was Rector from 1989 to 1996. In this connection, it is interesting to note that despite this quite radical stance, Høyland, too, came from the “conventional” applied art community. Not only was he a member of the *Bonytt* editorial committee from 1965—he also worked at the applied art colony PLUS in Fredrikstad (albeit in its more “industry-friendly” division, designing, for example, various plastic products) and was that institution’s art director from 1962 to 1965. Wenche Anette Johannessen, *Brukskunst-senteret PLUS—Per Tannums ønske om å etablere et designsentrum* [Master thesis] (Oslo: Universitetet i Oslo, 2000) 88–9 and Petter Henriksen et al. (eds.), *Aschehoug og Gyldendals store norske leksikon* [3 ed.] (Oslo: Kunnskapsforlaget, (1995–9) 7, 359.



Institute of Technology, had at the time of his 1968 visit to Oslo spent two years in India trying to apply his design expertise to the fundamental problems and primary needs of a developing country.<sup>42</sup> Deeply moved by the young American's commitment and devotion, Hennem wrote:

The industry to which design can be applied in the rich countries often produces products which do not fulfill the consumers' *genuine* needs, but the fictitious needs created by PR and advertisement and are necessary in order to keep the machinery of wealth going.<sup>43</sup>

Hennem quoted Yonkers to the assertion that the way the economic system of the Western world exploited industrial design:

...can seem quite absurd even to a designer when seen in relation to the fundamental needs of the major part of the world's population. It is essential that we think in a global context if we are to survive.<sup>44</sup>

That an American designer in 1968 should come to Norway preaching the gospel of design as a tool for solving real problems for the real world, even promoting design as aid to developing countries, must have been somewhat surprising to the Norwegian design community, given the reputation that much of American design had in European design circles for being excessively commercialist.

### The Future in Our Hands

Nine years after Knut Fægri wrote "The 'Designer'—the 11th Plague" in which he accused the designer of being the devil's advocate by selling his services as fashionism or by styling to an industry that was stuck in a spiraling quest for profit, some of his central arguments were taken up in *Bonytt*—but again not by someone belonging to the design community. An article titled "The Sales Carousel," a critique of the consumption society, appeared in an otherwise quite de-ideologized *Bonytt*.<sup>45</sup> The author was Erik Dammann, who was about to become one of Norway's most dedicated, radical, and idealistic promoters of social change in the 1970s. In the late 1960s, having become disillusioned with the consumerism his job at an advertising agency required him to promote, Dammann moved with his family to the small island of Savai in West Samoa to live among the natives for half a year. He was so struck by the traditional Polynesian culture of sharing and distribution that the stay changed his life. Back in Norway, he left advertising for good and dedicated his life to promoting a better world, an alternative society based on cooperation, sharing, and experiences instead of liberal market economy, competition, and consumption. In Dammann's criticism, just as it had been in Fægri's, the designer was one of the principal targets:

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42 Gerd Hennem [sic], "Design—Et velstandsfenomen i den rike del av verden," *Nye Bonytt* 8/9 (1968): 62–5.

43 Ibid., 63.

44 Ibid., Statements made by Edward Hubbard Yonkers during his interview.

45 Erik Dammann, "Omsetningskarusellen," *Nye Bonytt* 1 (1971): 16–7. On the *De-ideologization of Bonytt*, see: Kjetil Fallan, "The Metamorphosis of a Norwegian Design Magazine: *Nye Bonytt*, 1968–71," in Grace Lees-Maffei (ed.), *Writing Design: Words and Objects* (Oxford: Berg Publishers, 2011): 47–61.

- 46 Dammann, *op. cit.*, 17.  
 47 *Ibid.*, 16–7, 28.  
 48 Erik Dammann, *Fremtiden i våre hender* (Oslo: Gyldendal, 1972). English edition: Erik Dammann, *The Future in Our Hands* (New York: Pergamon Press, 1979).  
 49 Wolfgang Haug, *Kritik der Warenästhetik* (Frankfurt am Main: Suhrkamp, 1971): 137. Another critical but less polemic German discussion of design's role in society appeared two years later in Gert Selle, *Ideologie und Utopie des Design: zur gesellschaftlichen Theorie der industriellen Formgebung* (Köln: DuMont, 1973).

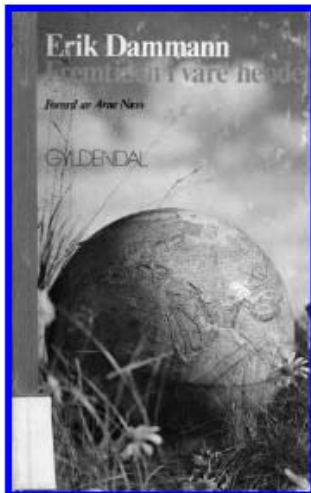
The main problem for the restless consumers of the West is not just that there are too many advertisements, but just as much that there are too many material goods to advertise for. The affluence is not created by advertisement, but by industrial researchers, product developers and industrial designers, by engineers, chemists, artisans and architects—all those who work in production and commodity trade. Of course, there is nothing wrong in producing and selling goods that bring the buyer pleasure and enrich his way of life. The problem is that a substantial part of the goods that are manufactured today are *not* produced to give the buyer increased satisfaction in the long run, but to make him dissatisfied with what he already has, so that he will replace his possessions at an ever increasing rate ... Of course there are designers who primarily strive to create timeless products that simply have good and functional form. The problem is that they are a minority.<sup>46</sup>

In addition to the striking similarities between the criticisms of Dammann and Fægri, there is also an important difference. Recall that Fægri, despite strong evocations of his expertise and interest in ecology and resource management, made no explicit link between these concerns and the commodity production he criticized. Dammann, on the other hand, clearly states that ecology and resource management, together with social justice, humanist values, and natural and cultural experiences, motivated his critique.<sup>47</sup> Although striking, this difference between Fægri and Dammann is hardly surprising, as much had changed—in terms of political climate, knowledge production, and public mentalities—between 1962 and 1971.

As for Dammann, he continued his work throughout the 1970s and beyond. In 1972, he published a book called *The Future in Our Hands* (*Fremtiden i våre hender*), in which he portrayed the glaring inequality of living conditions between the developing countries and the West and argued for a society of reduced production and consumption and a more fair distribution of resources (see Figure 3).<sup>48</sup> The book, which included a preface by eco-philosopher Arne Næss (who had recently, in 1970, retired from his professorship at the University of Oslo at the age of 58), formed the basis for the establishment two years later of the environmental organization/movement bearing its name. The movement grew during the 1970s to have more than 25,000 members and obtained considerable political influence.

Dammann's critique seems to correspond with contemporary campaigns elsewhere, as well. In Germany, Wolfgang Haug indicted design for serving as the "Red Cross of capitalism" in his *Kritik der Warenästhetik* (*Critique of Commodity Aesthetics*) from 1971.<sup>49</sup> A kindred

Figure 3  
 Cover of the book *Fremtiden i våre hender* (*The Future in Our Hands*) by Erik Dammann, first published in 1972. Cover photo by Bjørn Winsnes. Courtesy of Gyldendal Norsk Forlag.



and contemporary, but far more disseminated, critique of design as the lackey of consumer society was offered by Victor Papanek in his famous book, *Design for the Real World*.<sup>50</sup> Papanek, of course, traveled far and wide with his mission to reform design practice, but his Scandinavian connection is of particular interest in the present context. *Design for the Real World* was first published in Sweden in 1970, under the far more polemic title, *Miljön och miljonerna: design som tjänst eller förtjänst?* (translated *The Environment and the Millions: Design as Service or Profit?*). The English edition appeared the following year, in 1971. The book came about as a result of Papanek's being a guest lecturer at the Konstfack University College of Arts, Crafts and Design in Stockholm from 1968 to 1970, and he also guest lectured at design schools in Helsinki, Copenhagen and Oslo.<sup>51</sup> Here, his radical ideas found a ready audience among the more progressive elements of the Scandinavian design community.

During a trip to Stockholm in 1968, just after he began teaching at the National College of Art and Design, Roar Høyland met Papanek and promptly invited him to Oslo. Papanek accepted and stayed for a week as a guest at Høyland's house while giving all-day lectures that attracted virtually every student at the design school. Theory was accompanied by action: During two weeks in January 1969, Papanek and Høyland staged an event where they and their students redesigned and transformed a notoriously neglected and polluted communal back yard in one of the city's less privileged neighborhoods into a more agreeable recreational area, complete with a playground, furnishings, greenery, and all. This stunt even made it onto national television news broadcast.<sup>52</sup>

Already in 1969, then, a year before the first version of his famous book was published, Papanek's radical ideas on the social and moral responsibility of design were reaching Norwegian design students. According to Papanek, presenting the Oslo project in the book, the social aspects of it had quite an influence on the aspiring designers—and on other students as well:

The students were appalled to find that the backyard was infested by rats and that the children played with the rats and thought of them as pet animals, something of the order of small dogs. We saw that design would have to go beyond a playground to include factors of public health and hygiene. Because of the social relevance of this project, other students from the Architectural School [Oslo School of Architecture], the School of Landscape [Norwegian Agricultural College, Dept. of Landscape Architecture], and Oslo University [University of Oslo] became interested and volunteered their help, even though students from these schools normally have little or no contact with the State School of Design [National College of Art and Design].<sup>53</sup>

50 Victor Papanek, *Design for the Real World: Human ecology and social change* (New York: Pantheon Books, 1971).

51 Victor Papanek, *Miljön och miljonerna: design som tjänst eller förtjänst?* (Stockholm: Bonniers, 1970). On his lecturing at Konstfack, see Lasse Brunnström, "Från konst och teknik till industriell design" in Lasse Brunnström (ed.), *Svensk industridesign: en 1900-talshistoria* (Stockholm: Prisma, 1997) 39 and Kerstin Wickman, "Industridesign" in Gunilla Widengren (ed.), *Tanken och handen: Konstfack 150 år* (Stockholm: Page One Publishing, 1994): 286, 294–5. In the late 1960s, Papanek visited the University of Art and Design Helsinki on several occasions: Pekka Korvenmaa, *Finnish Design: A Concise History* (Helsinki: University of Art and Design Helsinki, 2009) 222. In the 1970s, Papanek also lectured at the design program at The Royal Academy of Fine Arts' School of Architecture, Copenhagen: Hans-Christian Jensen, *Fra velfærd til designkultur—Velfærdsengagementet i dansk designteori og designpraksis i det 20. århundrede* [Doctoral dissertation] (Odense: University of Southern Denmark, 2005): 52.

52 Roar Høyland in conversation with the author, March 28, 2007.

53 Victor Papanek, *Design for the Real World: Human ecology and social change* (New York: Pantheon Books, 1971): 125.

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- 54 Kjetil Fallan, *Design History: Understanding Theory and Method* (Oxford: Berg Publishers, 2010): 55–6.
- 55 Dag Solstad, *Roman 1987* (Oslo: October, 1987): 244.

Marrying social responsibility with environmental regeneration, Høyland and Papanek's backyard playground project became emblematic of the new critical design discourse taking hold at the turn of the 1960s.

The reorientation of critical design discourse traced in this article, from consumer activism toward environmentalism, can also be couched as a politicization of design criticism. That part of the design discourse was moving in this direction was of course no isolated process, but a shift in what might be called the *seamless web of sociodesign*.<sup>54</sup> This sense of (need for) change, felt so strongly in many progressive parts of society at large, has been described quite poignantly by the novelist Dag Solstad, who let his radical historian protagonist recall the sentiment of 1971: "I suspected that modernity had changed from aesthetics to politics, from art to revolution."<sup>55</sup>

# Subtle Technology: The Design Innovation of Indian Artisanship

Ken Botnick, Ira Raja

Craft culture is human culture. The impulse to shape by hand objects of everyday needs and rituals, or those things whose role it is simply to delight us, is an innately human quality, and one that may be traced to human prehistory. If we accept that crafting objects by hand is one of the defining traits of being human, then our present state of culture—in which craft has disappeared in the “overdeveloped” world and is rapidly disappearing in the developing world—should cause us to pause and think about what it is that has been lost or is about to disappear. Craft in the industrialized nations is defined by preciousness, and an extraordinary value is attributed to the handmade as an exotic species. In the developing world, it is either considered to be lowly hand-work, or a resurrected practice for the poor to gain access to valuable foreign exchange. Caught between a rock and a hard place, we in the West fetishize the object, while in the developing world we romanticize the humble craftsman and his poor condition. But neither of these approaches really looks past the artifact (as either fetish or commodity) to the role of craft as a catalyst for spurring thought and innovation in society. We may lament the loss of the beautiful objects we now view in museums, but what if the ultimate value of craft lies not in the artifact but rather in the process by which it comes to be?

Looking closely at craft-driven cultures still alive in the world can provide remarkable insights into contemporary problem-solving. For models of sustainability and economy, nothing could improve on the working methods of the craftsman, sourcing his materials locally, wasting nothing, delivering custom goods made to order—again, locally. Innovation and adaptability are the two skills most required of a craftsman to sustain his livelihood, and so we see simple and useful innovations introduced to age-old functions as society’s needs and its materials change. Tools are simple and multi-functional. Knowledge transfer is direct, from generation to generation. But most importantly, the process of shaping materials into objects, of meeting functional needs, and of fulfilling simultaneous longings for beauty and creativity involves an expression of fundamental human agency that is manifested not only as an artifact or a commercial object but equally as stimulus to innovation. This paper pursues the idea of craft as stimulus. It does this through an exploration of the element of design thinking in everyday craft practice in India.

### Intimacy

The intense energy of Indian streets is the result of remarkable human activity, evident not just in the milling crowds but also in the visual exuberance of colors, patterns, signs, and symbols that are mostly fashioned by hand. This juxtaposition gives rise to a peculiar (and delightful) contradiction: on the one hand, the impersonal anonymity habitually associated with large crowds; on the other, the intimacy of an environment that has largely been brought to life by human touch. Intimacy in this scheme of things is not some throwback to an archaic world, and to affirm the intimacy of craftsmanship is not to sentimentalize the practice. Rather, intimacy needs to be seen as a quality that has both creative and practical dimensions in contemporary design practice and is the fertile ground from which innovative practice springs.

Drawing upon a popular axiom from contemporary design circles—"making is thinking"—we take the position that experiential knowledge is the most direct stimulus to innovation. Inherent in any craft practice are the multiple and repeated stages of simple hands-on contact between the craftsperson and her materials—a process that uniquely equips the craftsperson to deal with unexpected and unforeseen problems. The intimate, experiential knowledge of the craftsperson is irreducible to abstract principles. To draw on the ideas of the economist, Friedrich Hayek, such knowledge is impossible to translate into statistics, which are generated "precisely by abstracting from minor differences between the things, by lumping together, as resources of one kind, items which differ as regards location, quality, and other particulars...."<sup>1</sup> The process of generating statistics would thus seem to call for an elimination of the very basis of innovation that lies in the knowledge of detail—knowledge that only the "man on the spot" (as against a central authority) might possess. The craftsperson is in possession of this on the spot knowledge and we call the mode of design thinking born from such an experience "subtle technology." We further propose that the Indian craftsperson, faced with the demands of a population that is continually testing the limits of its resources, may be seen as a model for sustainable and innovative strategies that are applicable to contemporary design practice.

### Anthropomorphism

Human desire for intimacy is often manifested in our natural tendency to anthropomorphize everyday objects. A vivid example of this tendency may be found in Indian "truck art." Driving through the scrubby desert landscape along the road from Ajmer to Udaipur in western India, for instance, it is not unusual to find wooden stalls selling brightly colored ribbons, hair extensions, and plastic flowers, all manner of strings and sequins, images of gods and goddesses, signage, and more. The chief clients for these objects are truck drivers who buy them not, as one might think, for their wives, left behind at

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1 Friedrich Hayek, "The Use of Knowledge in Society," *American Economic Review* 35 (1945): 519–30.



Figure 1 (above left)  
Truck with eye.



Figure 2 (above right)  
"I am the holy basil plant of your courtyard."

home when the men embark on their long and frequent road trips, but rather, for that other beloved in the driver's life—his truck.

Purchasable accessories are only a small part of "truck art," which has a special place in Indian street design. The trucks are also lovingly painted in lavish colors and motifs, including birds, flowers, animals, young maidens, and also often body parts, such as eyes and lips. Painted eyes are meant to counteract the "evil eye" of ill-intentioned people or strangers in the vehicle behind the truck (Figure 1), but when painted strategically on or near the windscreen, they serve to endow the truck with a face of its own!

Figures are often also accompanied by textual references that cast the truck in the role of a female lover. The Hindi text on the back of the truck in Figure 2, "*Main Tusi Tere Angan Ki*" ("I am the holy basil plant of your courtyard"), for instance, is a reference to the title of a 1978 box office hit Bollywood film. In the film, Tusi, the hero's mistress, with whom he is deeply in love, dies after giving birth to their son, who is then lovingly raised by the hero's lawful wife. The phrase, which appears with remarkable frequency on the back of trucks in northern India more than three decades after the film first hit the screens, not only feminizes the truck but also at once recognizes its rivaling claim to the man's affections; meanwhile, it finds the rhetorical means to accommodate that claim within a familial framework, through a reference to popular melodrama. However, the meaning of Tusi is not exhausted by the film reference. Tusi stems are carved into beads, the beads shaped into necklaces, and the necklaces worn by "wives for the good of husbands;" thus, the reference also invokes the idea of the truck as a loyal, faithful wife whose Tusi decoration will protect the driver/husband.

If Tusi is richly symbolic of a romantic relationship between the truck and its driver, other text opts for a more direct line of address, albeit along the same vein. A truck encountered along the same road from Ajmer to Udaipur had a message painted on the fuel tank that cast the vehicle as an extravagant beloved (a "Queen"), and pleaded with her to check her excessive consumption of the precious "water from Iraq:" *Iraq ka paani/ Thora kum pi meri rani*.

In their work on anthropomorphism, Epley et al. argue that the need to anthropomorphize often speaks of a desire to establish social connections with other humans. Through anthropomorphism this need can be satisfied by enabling the perception of a human-like connection with non-human agents.<sup>2</sup> Truck drivers travel long distances and often spend a lot of time away from their families. It is precisely because people in India are traditionally quite connected socially that even a temporary disconnect from the social context may result in the manifestation of anthropomorphism. However, to mobilize the language of intimacy to articulate one's relationship with one's source of livelihood may have other, even more tangible consequences. To draw again upon the work of Epley et al., the universal tendency of people to attribute human-like properties, feelings, and motivations to real or imagined non-human agents and objects enables them to interact more effectively with their environment,<sup>3</sup> enhancing their ability to make sense of a non-human agent's actions, reducing the uncertainty associated with it, and increasing confidence in predicting how it might behave in the future. Thus, anthropomorphism may be linked with a fear of uncertainty.<sup>4</sup> Commercial vehicles, being a source of income for their owners and therefore playing a role in their owners' welfare, are thus far more prone to being anthropomorphized than private vehicles.<sup>5</sup> Treating machines and other tools of trade as human also means that they are deemed worthy of respect and concern and not to be viewed as mere objects, which may have further implication for how well one is able to master their technical and mechanical aspects.<sup>6</sup> The phenomenon of anthropomorphism described thus indexes the creative and practical uses of intimacy.

### Embellishment

The pleasure signaled in the sheer excess of truck art is not fully explained by the anthropomorphism thesis. Trucks are not rigged out in flowers, sequins, and hair extensions simply to facilitate the myth of their humanity. The embellishment of trucks also fulfills a creative urge, the signs of which are distributed widely in Indian culture. This observation leads to an important corrective to the history of human cultural development offered by the ethologist Ellen Dissanayake. In her book *Art and Intimacy*, Dissanayake uses "elaboration" as another term for her earlier concept of "making special." However, as she is careful to point out, making something special is not only making it beautiful. Positioning herself against conventional histories of humanity, where the artistic impulse is considered to be a relatively late development, Dissanayake argues that, on the contrary, it was a primal impulse, originating in prehistory in the intimate reciprocity of ancestral mothers and infants. The "special" for Dissanayake arises less from a transcultural desire for beauty than from a basic human need for intimacy—both of which are fulfilled in the creative act of elaboration.<sup>7</sup>

2 Nicholas Epley, Adam Waytz, and John T. Cacioppo, "On Seeing Human: A Three-Factor Theory of Anthropomorphism," *Psychological Review* 114:4 (2007): 864–86.

3 Epley et al., 865.

4 Stewart Guthrie, *Faces in the Clouds: A New Theory of Religion*, (New York: Oxford University Press, 1993).

5 Epley et al., 872.

6 Epley et al., 864.

7 Ellen Dissanayake, *Art and Intimacy: How the Arts Began* (Seattle, WA: University of Washington Press, 2000).





Figure 3 (above left)  
A simple strengthening would not have called for the care this backhoe bucket shows in its design of welded bracing, Rajasthan.



Figure 4 (above right)  
Sound as embellishment.



Figure 5 (lower right)  
Decorated elephant.

Elaboration connects the maker (and user) to a unique cultural context by employing shared aesthetics in color, pattern, and material, even as it enables makers to mark the object with their individual stamp, their personality—to announce to the world their role as creator. Embellishment is a way of making something one’s own, giving it an identity. In India, it is a way of expressing “I care enough to make this beautiful.” Thus, the elaboration fulfills a dual purpose: to designate something as belonging to an individual and to make it special (Figure 3).

Making functional things—cups, chairs, signs, books—is creativity applied to meeting a need; meanwhile, embellishing that object requires the maker to take time, to ask more questions—questions about its function, about the person who will use that object, and about how to distinguish that object from the universe of things that surround it. Embellishing is the way we identify the object as part of a larger cultural tradition using colors, symbols, patterns, and even language. It is what takes a generic, functional thing and places it firmly in a larger cultural context. It makes the object simultaneously more particular to the maker’s personality *and* brings it into the shared cultural values of beauty and function (Figures 4 and 5).



Figure 6 (above left)  
Used saris are soft enough to cradle children.



Figure 7 (above right)  
Old saris are used here as fencing around a  
newly planted vegetable garden, Rajasthan.

### Adaptability

Scarcity of resources can place demands on people to become more adaptable and innovative in their daily life, and examples of contemporary Indian design thinking aimed at maximizing resources are ubiquitous. This perspective includes the kind of design thinking that is required to ensure multiple afterlives for the crafted object once its principal usefulness has been exhausted. However, while we see the craftsperson's contribution as the genius applied in forming material, we rarely give him or her credit for more abstract design thinking about the broad implications of the creation.

The unstitched garments of India, the sari and the lungi, are two of the most obvious examples of objects made for a use cycle that calls for endless adaptation of the original product. The adaptive reuse cycle is made possible, however, only by the simplicity of the original garment. The simplicity of the original shape of the garment—a rectangle with no additional stitching—lends itself to endless numbers of adaptive re-uses once the textile has become too frayed or thin to be used as clothing. Of course, the original weavers of saris were not thinking of a complex design process that would allow for such reuses; they were simply producing yardage off their looms that could be easily wrapped for clothing or other uses. The ingenuity of design adaptation in this situation came after the original sari; now, a worn garment in India is seldom considered “waste” because the fact of its “worn-ness” and age have made it perfect for re-use as a pillow, baby sling, or even a fence (Figures 6 and 7). (In contrast, today we pay minimum wage to laborers in Bangladesh to sandblast jeans for the world marketplace so that they have the right touch of softness pre-made. But this immediate, and unnaturally achieved appearance comes at considerable cost to the health of the workers and to the environment.)

In India, where petrol is precious and space on the roads at a premium, adaptive thinking leads to some innovative, and often dangerous, means for moving materials to market. The grain trucks seen across India have been transformed into balloon-like structures using soft, expandable sides, rather than rigid panels, so that they can



Figure 8 (above left)

The use of soft and expandable sides allows for these overloaded trucks to carry the absolute maximum, which also maximizes the danger of encountering one on the road.



Figure 9 (above right)

The shape of the basket places the load highest on the back and allows for more to be carried in every trip, Manali.

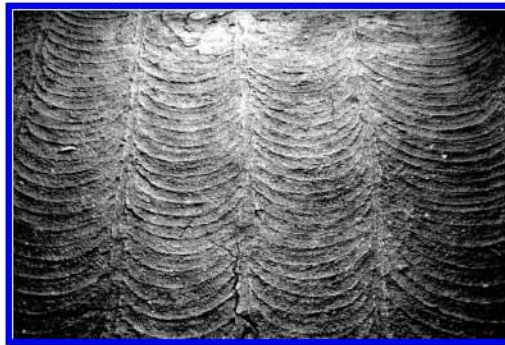


Figure 10 (lower right)

A beautiful cow-dung and clay floor in Ahmedabad.

carry an expanded amount of grain. These grain carriers sometimes strain credulity and safety as farmers try to include every extra grain in their load in order to make their trip more profitable (Figure 8).

In a similar fashion, women in the hill state of Himachal Pradesh, in North India, who have to carry animal bedding and fodder up steep slopes on a daily basis, have adapted a cone shaped basket so that most of the weight is forced to the top of the load, making them easier to carry, while allowing, again, for a load that exceeds the structure of the vehicle (in this case the woven basket) (Figure 9).

To practice effective, sustainable, and adaptable design is to engage in an intimate understanding of the object being made, the material of which it is made, and the complete life cycle of the material and process, beginning to end. Cow-dung, for example, has myriad uses in Indian life and is never considered mere waste product. The use of cow-dung as flooring material represents the epitome of subtle technological design thinking (Figure 10). Consider the completeness of the cycle: This floor began as soil and sunlight, then as grass to feed the cows, which then became the dung collected by women across India for fuel and fertilizer. The dung is mixed with clay and water, then applied to the floor with the hands while it is still wet, allowing it to be shaped by the hands of the maker to eventually become a firm, impermeable, cool, clean surface. In this photo of a floor in Ahmedabad, one can trace the fingertips of the



Figure 11 (above left)  
Terracotta cups, or "kulhad."



Figure 12 (above right)  
A leaf bowl on a train platform in Rajasthan.

floor maker by the swirls left in the surface to dry, the ridges gently massaging the feet that walk over them. The maker of the floor must be sensitized to the degree of comfort of the ridges; too much can be uncomfortable to stand on. The beauty of the floor isn't just in the feeling in the sole of the foot as it encounters the ridges of the floor; the effect of the swirled pattern on the eyes is also appealing and soothing. Rather than a monochrome, two-dimensional, plane of a floor—a result that would be achieved by choosing a tool to smooth the surface instead of using the fingers—we see a gentle interplay of shade and shadow as light plays across the surface. This floor even has pleasing aural qualities, producing a quiet inside the home by virtue of its sound-absorbent properties.

A similarly complete cycle can be found in the terracotta tumblers ("kulhad") used for serving tea on train platforms, or the leaf bowls that are filled with dal and quickly handed off to arriving or departing passengers (Figures 11 and 12). When the bowl becomes saturated (passengers must eat in a hurry, even as they must find their seat), it can be discarded on the railway platform, where it becomes fodder for the cows; the terracotta tumbler can either be reabsorbed into the soil, or is sometimes reused by the potter to make new cups.

### Hand-Painted Signs

The visual landscape of an Indian street is a whirlwind of letters, symbols, words, and images, often made personal by the hand and eye of the sign painter. Indian sign painters lavish attention and flourishes on letters and symbols in the same way other craftspeople attend to the objects they make. In the streets, letterforms take on shades of anthropomorphic life—sophisticated, three-dimensional, visually complex expression, where the very surface on which the painter works often becomes part of the message itself. The sign painters have turned letters into form, with the possibility of formal expression and nuanced meaning around each linguistic corner.

Indian sign painters are in love with dimensionality and make liberal use of it in their work. Three-dimensional rendering of letterforms has become a shared aesthetic—almost an affectation of Indian sign art. However, because the work is handcrafted, the



Figure 13 (above left)  
Parvathagiri sign, painted with skilled three-dimensional rendering.



Figure 14 (above right)  
A painted signboard in Warrangal employs a heightened three dimensional effect oriented toward the passersby on the street.

shared aesthetic gives rise to a wealth of ingenious embellishments as the shape and the form of letters prove to offer an almost limitless palette. These three-dimensional letters represent sophisticated thinking on the part of the sign makers about the rendering of three-dimensional space in two dimensions. Almost all letters get some sort of dimensional treatment, usually in the form of outlining or a drop-shadow; this sign in Telugu, from the town of Parvathagiri in Andhra Pradesh, is a brilliant example of dimensional painting (Figure 13). The blocky shape of the letters immediately implies a solidity, underscored by the shading at the top and left side of the letters. For good measure, the painter has included a black shadow at the bottom, to establish the figure-ground relationship and further enhance the sensation of dimensionality. Placing the word diagonally, and subtly shading it from dark to light, also implies depth within the frame of the sign itself. The word image emerges from dark to light, moving toward us in space. The word at the bottom with light colored outline shows a typical technique for implying dimensionality, and the letters look flat compared to the dimensional ones above, thereby enhancing the dimensionality of the words at the top. Another sign seen in Parvathagiri—a seeming hotbed of three-dimensionality in visual expression—shows a unique, single-point perspective to its composition (Figure 14).

While the Telugu sign shows a conscious, innovative use of geometrical space to convey movement and facilitate dynamic interaction with viewers, other signs show an equally impressive, or perhaps even greater, understanding of space and dimensionality. Painted signs on walls present a unique challenge. How does the painter deal with the continually changing topography and surface texture of the wall on which he paints? Sometimes this interaction results in surprising, even ingenious alterations of the message, as in this image from a wall in Ahmedabad (Figure 15). Faced with painting the same advertisement repeatedly along a foundation wall of a bridge over the Sabarmati River, the painter seizes the chance to



Figure 15 (above left)  
Underwear sign in Ahmedabad.



Figure 16 (lower left)  
The classic Indian tiffin.



Figure 17 (right)  
A watertap near Kalleda, Andhra Pradesh.

add dimension, humor, and delight by incorporating a drain opening in the wall as the navel of the torso. Rather than being flummoxed by such an inconvenience, this painter exerted his agency, shifted the relationship of the torso to the holes in the wall, and created something unexpected that makes the torso come alive. And the mynah bird enjoys its home all the same.

### Modularity

Modularity, as a characteristic of design thinking, has efficiency as its guiding principle. Born of the competition for space and resources, the modular impulse in design seeks simple solutions to problems, which can be seen in the graduated sizes for water pots, and in the cultural icon of India, the tiffin. Modularity not only allows for space-saving efficiencies; it also allows one unit of the module to perform dual functions: at one moment it is container, at another it is lid. In the case of the tiffin-carrier, an incredible range of efficiencies are achieved in a compact construction: It is space-saving, easily transportable, easily cleaned, and designed to retain maximum heat until the food is eaten (Figure 16).

The water-carrier is an ancient image in Indian art, and one of the arresting images still seen in many parts of the country. Women collect water from a distant source, carrying it on their heads back to their homes, just as women have done for perhaps thousands of years (Figure 17). Contemporary design of these vessels, called the "matka" in Hindi, is testimony to the power and constancy of shape as a driver of Indian design thinking. The original water vessel



Figure 18 (above left)  
Kitchen interior in Warrangal.



Figure 19 (above right)  
Vegetable cart in Punjab.

was most likely the calabash, a hollowed gourd with hardened shell, perfect for holding water. Because the gourds had round bottoms, a system was required to hold the one rounded surface, the calabash bottom, comfortably on another, the head. Thus was created the “eendi”—a doughnut-shaped headpiece designed to hold the pot securely while the women walked. We see this same system today especially in North India, and whether the *matka* is made of brass, terracotta, or plastic, its shape bears direct resemblance to the original—rounded bottom and all. This design seems a little counter-intuitive to westerners, who would imagine the water vessel needs a flat bottom to sit perfectly on another surface. But the *matka* and its shape persist. And it is possible to see that the design of the *matka* supports the concept of modularity in design because of how the graduated scale of water pots is designed to allow one to fit inside the other, forming a lid for the one below (Figure 18). Access to clean drinking water will, we hope, one day be a reality across India. But development of that system is woefully slow, and so women continue to bear the responsibility of supplying their families with water, at the cost of tremendous physical effort and time.

Displays of food, cloth, and tools in shops across India are powerful evidence of the importance and persistence of Gestalt grouping principles. Retail techniques, such as displaying goods in windows and interiors so that consumers can browse and window-shop, are conventionally associated with upscale department stores—a distinct development of the nineteenth century in the west, the analog of industrialization, and the catalyst for consumerism. But the marketing of ordinary goods—which often are sold on the sidewalk or from a wooden hand-cart, or even on a basket carried on the head—also often involve elaborate design, display, and sales patter that have remained unexamined. Most Indian marketplaces demonstrate the extraordinary care taken to display fruits and vegetables in appealing and imaginative ways (Figure 19).

Figure 20  
Used tool display in Ahmedabad at the  
Sunday Market.



To order and categorize by color, shape, and size, or to create a lively pattern with the goods being sold seems to be inherently part of the selling process. Consider the image from the Sunday Market in Ahmedabad of used tools arranged carefully by size, color, and use in a modular construction. Diverse sets of objects can then be inserted to create something resembling a typology of tool types (Figures 20). Perhaps this came about because the shop owners never had very elaborate structures to show their wares. Having only a simple cart or stall is an impetus to arrange things stylishly and in appealing ways, as if to overcome or de-emphasize the limitations of the surroundings. Whatever the reason, it is clear that even shops serving the laboring poor invest time and energy in the display of goods.

### Conclusion

Since the turn of the twentieth century, design has come to be defined as a professional activity decoupled from the manufacturing process. This separation has established the design profession in hierarchical opposition to craftsmanship. Post-industrial society has even expanded the gap between the professional designer, whose practice has become increasingly strategic and information-driven, and the traditional role of the craftsperson, accustomed to making decisions in response to on-the-spot conditions of materials and demand for the product. Through this series of examples of hand-crafted objects from everyday life in India, we have tried to show that the design thinking inherent to the practice of the craftsperson is a reflexive and dynamic model—one that is worthy of attention for its innovative and individualized solutions. The examples used in this article have been chosen to illustrate the role of intimacy—with materials, techniques, and even clients—that shapes the work of the craftsperson. Design strategies fueled by this intimacy are manifest in the modularity, adaptability, and embellishment that shape the craftsperson's thinking and doing.



In addition to challenging the hierarchy in professional design and craftsmanship, this paper has also sought to challenge a parallel, and once again hierarchical, opposition between the privileging of individual identity in western cultures and the valorization of a supposedly undifferentiated communal identity in more traditional societies such as India. The examples cited show how embellishment, in the form of colors, symbols, and patterns, allows us to identify a generic, functional article as part of a cultural tradition; meanwhile, they simultaneously illustrate how embellishment makes the object reflective of the maker's distinct personality. They reveal how Indian aesthetics represent both the shared cultural values of beauty and function and the individual "signature" of the maker—the mark by which craftspeople individuate their work and make it their own.

# Gestalt and Graphic Design: An Exploration of the Humanistic and Therapeutic Effects of Visual Organization

Julia Moszkowicz

Posters on the streets ... could disseminate socially useful messages, and they could train the eye, and thus the mind, with the necessary discipline of seeing beyond the surface of visible things, to recognize values necessary for *an integrated life*...<sup>1</sup>

Writers and historians in the field of graphic design have long acknowledged a connection between Gestalt psychology and the origins of this field.<sup>2</sup> In “Writing Lessons: Modern Design Theory” (1988), Ellen Lupton describes an emergent relation between Gestalt psychology and the practice of design in and around the Bauhaus in the 1920s. She states that: “Gyorgy Kepes recognized the usefulness of the new psychology, and he directly incorporated it in his *Language of Vision*.”<sup>3</sup> Lupton argues that around this period, Gestalt psychology established itself as a dominant approach to visual communication in Europe and America, gaining importance as a significant form-giving methodology, both in Berlin and at the New Bauhaus, Chicago (where Kepes was employed as a tutor in 1937). Indeed, a close inspection of the *Language of Vision* reveals a dedication to the three pioneers of Gestalt psychology: Kurt Koffka, Wolfgang Kohler, and Max Wertheimer (on the inner sleeve). Furthermore, an edited collection of essays by Gyorgy Kepes, titled *Sign, Image, Symbol* (1966), includes a contribution from Rudolf Arnheim, a renowned art critic who studied with Kohler and Wertheimer at Berlin University between 1923 and 1928.<sup>4</sup>

While this intellectual connection between Gestalt and Graphic Design is irrefutable, the overall assessment of Gestalt’s effect on the discipline is more open to question. Many of the Gestalt applications to graphic design from the 1930s onward are viewed (by those in design practice and education) as outmoded, and in this respect Lupton’s interpretation is typical. Indeed, the fundamental principles of Gestalt are widely characterized in negative terms, especially once postmodernism had been widely accepted in the late 1960s and early 1970s. In an edition of *Design* from 1968, for example, Corin Hughes-Stanton exalts the rise of postmodern design at the expense of “old” design thinking. He argues that “The essential

- 1 Gyorgy Kepes, *The Language of Vision*, 1944, (New York: Dover Publications, 1995), 221 [emphasis added].
- 2 See Ellen Lupton and J. Abbott Miller. “Visual Dictionary,” in *The ABCs of [triangle, square, circle] the Bauhaus and Design Theory* (London: Princeton University Press, 1993); Roy Behrens, “Art, Design and Gestalt Theory,” *Leonardo* 31:4 (1998): 299–303; or Hal Foster, “The Bauhaus Idea in America,” in *Albers and Moholy Nagy: from the Bauhaus to the New World*, ed. Achim Borchardt-Hume (London: Tate Publishing, 2006).
- 3 Ellen Lupton, “Writing Lessons: Modern Design Theory” (paper presented at the graduate seminar taught by Rosemary Bletter, City University of New York Graduate Center, 1988), <http://www.designwritingresearch.org/index.php?id=47> (accessed May 15, 2010): 1.
- 4 Kepes’s reliance on Gestalt methods is also revealed through his use of Gestalt diagrams throughout *The Language of Vision* (1944), which demonstrate his interest in the early optical experiments of Gestalt psychologists.

point is that the new design thinking is free-wheeling, and, unlike the philosophy which gave coherence to the Bauhaus or Modern school of design, it has not had, nor does it show signs of having, any dogmatism towards actual design forms.”<sup>5</sup>

This paper argues that such a rejection of Gestalt, however, is based on a binaristic, reductive view of the early discipline. Gestalt is critiqued for its abstract and universalistic terms and for its implicit support of the idea of autonomy, whereby human perception and visual forms are accorded relative independence from the vagaries of socio-historical concerns.<sup>6</sup> Lupton, for example, proposes that a Gestalt approach to visual communication is predicated on “the isolated study of abstract form.”<sup>7</sup> This paper pursues a different line of critical analysis, offering a historical relation of works that are now generally neglected, returning to the pioneers of the discipline as part of a timely reorientation of Gestalt thinking. The paper counters the negative impressions of Gestalt theory with detailed historical work, revisiting the primary texts of its early proponents and highlighting its development into a recognized therapy. At a time when graphic design is engaging actively with notions of interactivity and audience participation, Gestalt theory offers productive ways of thinking about possible structures for orchestrating positive human experiences.<sup>8</sup>

In particular, the paper draws conclusions about the therapeutic aspirations of the discipline; for if Gestalt has been deployed largely as a dispassionate theory or methodology within the field of graphic design, this deployment has been at the expense of its original aspirations toward making people, in society *feel* better. As I demonstrate in this paper, Gestalt theory is interested in the *quality* of human experience even at the very moment when it tries to *quantify* that experience. Consequently, this paper challenges the oversimplified caricature of Gestalt as a “scientific,” “objective,” and “abstract” theory, encouraging heightened awareness of significant distinctions between its psychological-scientific and philosophical-theoretical aspects. In the process, the paper offers a wider range of conclusions about Gestalt’s contribution to design methodology, ultimately arguing that the therapeutic values of Gestalt approaches have been overlooked in favor of its formalist critique.

### The Laws of Visual Organization

There is little doubt that Gestalt theory has been used to devise laws of visual perception within the fields of Fine Art and Graphic Design, and that the Bauhaus— and its associates—provide a focal point for its development as a critical methodology within these disciplines.<sup>9</sup> In *The ABCs of [triangle, square, circle] the Bauhaus and Design Theory* (1993), Ellen Lupton and J. Abbott Miller describe how Gestalt theories became central to design education after World War II and discuss how Gestalt psychology was actively used by Gyorgy Kepes, a designer who taught at the New Bauhaus in Chicago between 1937 and 1943. According to Lupton and Miller, Kepes used Gestalt

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5 Corin Hughes-Stanton, “What Comes After Carnaby Street?” *Design* 230 (February 1968), 123–5

6 See Dempsey Chang et al., “Gestalt Theory in Visual Screen Design: A New Look at an Old Subject.” *ACM International Conference Proceeding Series* 26 (2002), 5–12; Alex White, *The Elements of Graphic Design* (London: Allworth Press, 2002), and Lois Knight, “The Rules of Gestalt Theory and How to Apply it to Your Graphic Design Layouts.” *All Graphic Design*. <http://www.allgraphicdesign.com/graphicsblog/2008/03/04/the-rules-of-the-gestalt-theory-and-how-to-apply-it-to-your-graphic-design-layouts/> (accessed May 16, 2010).

7 Ellen Lupton, (1988), Op. Cit., 1.

8 This view is in keeping with contemporary developments in neuroscience, where critics have argued for the continuation of the Gestalt experiment as a basis for studying human perception and behavior. See Walter H. Ehrenstein, Lothar Spillmann, and Viktor Sarris, “Gestalt Issues in Modern Neuroscience,” *Axiomathes* 13:3–4: 433–58.

9 See Wassily Kandinsky, *Point and Line to Plane* 1926 Reprint (New York: Dover Publications, 1979); Gyorgy Kepes, *The Language of Vision* 1944 Reprint (New York: Dover Publications, 1995), Josef Albers. *Interaction of Color* 1963 Reprint (New York: Yale University Press, 2006).

principles to establish a systematic approach to visual organization, preferring visual forms to have a timeless “function” rather than a specific social “meaning.”<sup>10</sup>

Lupton and Miller say little more about the full range of individual laws themselves, as their analysis is focused on Gestalt’s interest in figure-ground relationships. They describe how Gestalt psychology identifies “active positive figures” (e.g., typographic forms or words) and the way in which they emerge only on “passive negative grounds” (e.g., white space or a blank page). Lupton and Miller state that: “Gestalt psychology offered design *a grammar of frames*, demonstrating the way a figure emerges against a neutral ground, which itself recedes as the necessary but invisible conditions of perception” [emphasis added].<sup>11</sup>

The description of Gestalt figure-ground principles soon gives way to an interpretation of their consequences for the history of Graphic Design. As the quotation reveals, a forceful argument develops about the “grammar” and “language” of post-war design, and how the laws of Gestalt provide a scientific basis for the development of its trans-historical formal and objective preoccupations (or rules). Lupton and Miller insist on the universal(-izing) tendencies of Gestalt psychology, which are perceived as producing common laws of visual perception and, hence, as establishing repeatable, ahistorical methods for making things “to be seen.”<sup>12</sup> The two describe how Kepes drew “heavily” on this universal, acultural aspect of Gestalt psychology, foregrounding the use of transcendent visual percepts over and above timely and culturally sensitive visual motifs.

Gestalt psychology is thus presented as a discipline that encouraged post-war designers to believe in the spontaneous emergence of good form (within the viewing subject, at least, because designers do have to work toward its formation). It is suggested that Gestalt psychology promotes an understanding of the visual domain that operates as a consequence of spontaneous brain functions; indeed, the capacity to view images is not a skill acquired through the accumulation of lived experience, enculturation, and learning (as a semiotic approach would argue). The viewer no longer needs to know something; she simply needs to *see*, and then the “good” Gestalten (or design) will emerge. Lupton and Miller conclude that “Gestalt theory challenged this belief [that an ability to make sense of visual data] ... is a learned skill, asserting instead that the brain spontaneously organizes sense data into simple patterns: Seeing is a process of ordering.”<sup>13</sup>

This notion of the “spontaneity” of vision seems to pose a problem for Lupton and Miller, who interpret such a belief as a type of ahistorical transcendence. Indeed, in an earlier account, Lupton characterizes Gestalt psychology as working with an independent and universal version of perception—one that is free from the vagaries of time, person, or place.<sup>14</sup> Within these terms, Gestalt is

10 Ellen Lupton and J. Abbott Miller, (1993).  
Op. Cit., 30.

11 Ibid.

12 Ibid.

13 Ibid.

14 Ellen Lupton, (1988). Op. Cit., 1.

problematic because it does not admit a more complex view of how people engage with images; it does not embrace a conception of *meaning* or *reading* and is only interested in the *seeing* of forms. Lupton states that: "According to Gestalt theory, the brain spontaneously orders and simplifies sense data into structured, wholistic patterns [sic] ... Like the 'grammar' of design, Gestalt psychology characterizes vision insofar as it can be quarantined from the context of everyday experience."<sup>15</sup>

At this point, distinguishing between different approaches to Gestalt thinking would be useful. While it is widely recognized as a form of Experimental psychology within the field of Graphic Design, it is also acknowledged—by those practicing in the field of Psychology—as an experiential mode of therapeutic relations that is organized around the interactive and real-time engagement of the client-counsellor situation. As Rudolf Arnheim explains in his seminal text, *Art and Visual Perception* (1954), there is a need to distinguish between Gestalt theory, Gestalt psychology, and Gestalt therapy.<sup>16</sup>

In *Art and Visual Perception*, Arnheim adopts a dismissive attitude toward therapeutic developments in the Gestalt discipline, arguing that: "The principles of my psychological thinking and many of the experiments I shall cite below derive from Gestalt theory—a psychological discipline, I should probably add, which has no relation to the various forms of psychotherapy that have adopted the name."<sup>17</sup> Even so, the distinction between theory and therapy is helpful, indicating alternative readings for the role of Gestalt in Graphic Design. In addition to an experimental science and psychology, for example, Gestalt can also be seen as a humanistic methodology that is actively engaged in studying the therapeutic effects of formal relations that transcend the two-dimensional plane. According to this proposition, the notion of integration is not simply about presenting coherently designed forms in the visual domain; it is also about the effect of the world of objects on the subjective disposition of human beings (or the audience-object/ designer-client relation).

This line of enquiry is pursued by the psychologist, Fritz Perls, who is largely responsible for taking Gestalt toward a therapeutic direction. In 1922, Perls was living and working in Berlin. Looking back on this experience in the 1960s, Perls notes that "Starting afresh. Most Exciting. We We! I enlarge the non-family world. We: bohemians, off the beaten path. Actors, painters, writers. Creating a new world. Bauhaus, Brücke, Dadaism..."<sup>18</sup> Although he did not become fully established as a Gestalt psychotherapist until he moved to the Esalen Institute in 1964, Perls had clearly started exploring the therapeutic potential of Gestalt techniques in America in the 1930s and 1940s. These techniques came to be formalized in publications such as *The Gestalt Approach and Eye Witness to Therapy* (1973), and involved a determined focus on the here-and-now, an encouragement toward self-awareness through physical and

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15 Ibid.

16 This is a view amplified by Mitchell G. Ash, who argues that the philosophical and conceptual development of Gestalt came before the experimental psychology methods of 1910 and after. It was based on the principles of Husserl's phenomenology before it was based in the discipline of psychology. See *Gestalt Psychology in German Culture 1890–1967: Holism and the Quest for Objectivity* (1995) Reprint (Cambridge: Open University Press 1998): 108.

17 Rudolph Arnheim *Art and Visual Perception: A Psychology of the Creative Eye* 1954 Second Edition (London: University of California Press, 1997)

18 Fritz Perls, "A Life Chronology." In *The Gestalt Therapy Page*, <http://www.Gestalt.org/fritz.htm> (accessed November 4, 2010).

sensational aspects of the body, and an enhanced appreciation of one's relation (as a part) to the whole. All of which is a far cry from the monolithic accusations of abstraction, cultural indifference, and a refusal to produce meaning within design discourse.

Initially, this link between Perls and a therapeutic turn within Gestalt thinking might seem tenuous and arbitrary. However, a closer reading of the *Language of Vision* reveals how this alternative view of Gestalt techniques amplifies the overlooked aspects of Kepes's "grammatology." In particular, the work of Perls echoes the humanistic tendencies of the latter's design methodology, in that his approach demonstrates an interest in a stable social subjectivity alongside a formal visual grammar. In his primer on design, Kepes argues that the organization of the visual field corresponds to the organization of the socio-economic plane. Kepes argues for the experiential as well as the experimental dimensions of design; integration and synthesis are conceived in terms of living, thinking processes that aspire to introduce a sense of wholeness within the human subject, as well as on the typographic page.<sup>19</sup> Writing during World War II, he identifies "the urgent need of an equilibrium" in a way that applies to the human spirit as much as to visual forms.

### The Pioneers of Visual Perception

Roy Behrens is one of the few critics who has challenged this dominant interpretation of Gestalt as ahistorical and blind to the socio-cultural aspects of design. He defends Gestalt from Lupton's accusation of "indifference to cultural meaning" and challenges the argument that its problematic character resides in the way in which it "isolates visual perception from linguistic interpretation."<sup>20</sup> However, he does not engage in direct intellectual exchange with established accounts (e.g., the key text by Lupton and Miller); instead, he brings an entirely different set of concerns into play. Behrens depicts the Gestalt discipline in terms of its pioneers and disciples, arguing for the significance of its theory in terms of an historically situated community. For Behrens, Gestalt is a set of living relations, a community populated by individuals actively engaged in psychology, intellectual criticism, and science.<sup>21</sup> He focuses, for example, on the relationship between the main protagonists of early Gestalt psychology—Koffka, Kohler, and Wertheimer—and traces their connections with other scientists, artists, and writers in the 1920s and 1930s, such as Arnheim and Kepes. In the process, he overlooks the philosophical constitutions and methodological dispositions of this broadening Gestalt community.

However, revisiting the writings of those who first inspired Kepes's interest in visual perception reveals a highly nuanced and shifting view of Gestalt principles.<sup>22</sup> In an overview of his contribution to the discipline, for example, Max Wertheimer describes how Gestalt psychology is interested in studying "thought-processes," particularly those that lead to "new solutions."<sup>23</sup> Although it looks

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19 Gyorgy Kepes (1995), Op. Cit., 126.

20 Roy Behrens (1998), Op. Cit., 2.

21 Ibid., 1–2.

22 Both Ellen Lupton and Roy Behrens draw on Hans Wingler's account of Gestalt's influence on the Bauhaus, although Lupton also consults Willis D. Ellis's collection of edited original texts titled *A Sourcebook of Gestalt Psychology* 1938 Reprint (London: Routledge & Kegan Paul, 1999): 71–88.

23 Max Wertheimer *Productive Thinking* 1945 Reprint ed. Michael Wertheimer (London: Tavistock Publications 1961), 237.

24 Ibid.

for *laws* of problem solving, Gestalt pioneers believe that thinking is ultimately a messy business, influenced by “human emotions” and “attitudes.”<sup>24</sup> Indeed, problem solving is not exclusively an orderly and rational exercise, but one characterized by “living thinking processes.”<sup>25</sup> A purely logical approach to problem solving, Wertheimer argues, strips these living, thinking processes “of all that is alive in them.”<sup>26</sup> Rather than quarantined from everyday life, Wertheimer identifies human subjects who are completely bound up in “the context of everyday experience.”<sup>27</sup> Against this drama of emotional turmoil, Wertheimer develops an argument for the productive value of finding oneself in a position to anticipate outcomes within the moments one inhabits; the therapeutic effect of an emerging “Gestalten” is viewed against a backdrop of individual confusion and disorientation.

In *Productive Thinking* (1945), Max Wertheimer describes how people’s everyday relations are unsteady and argues that people are driven by a desire for order and clarity in an object-world full of strains, stresses, disturbances, and ambiguities. He then proposes a model of idealized practices, formulating a problem-solving methodology for those seeking a stronger sense of decisiveness (such as psychologists, educators, artists, and laymen). Wertheimer wants to help people overcome this tendency toward chaos and temporary associations; he wants to organize their world and experiences in ways that will support them. Indeed, the book is characterized by an overriding awareness of the uneasy contingency of situations and people’s individual struggle to stay on top of things; it offers a narrative of social and personal uncertainty. The aim of the book is to show the reader how to see things more clearly, how she or he might start to introduce structure into the world and make purposeful connections between things. He states that: “For real understanding, one has to re-create the steps, the structural inner relatedness, the requiredness.”<sup>28</sup> In essence, he offers a model for strategic thinking; the book proposes learning from our (immediate) experiences. Furthermore, the indication is that some of these observations are made in retrospect; only by looking back on “confusion” can we stand a chance of recreating a movement toward internal order. Is it any wonder, then, that a social communicator such as Kepes wanted to implement some of these ideals? It is a treatise on thinking clearly oneself and helping others to develop such clarity.

Indeed, this reading of Gestalt offers up a humanistic and purposefully situated theory, one that is much less mechanistic and universalizing than the interpretation of Lupton et al. Wertheimer says that: “the function of thinking is not just solving an actual problem, but discovery, envisaging, going into deeper questions.”<sup>29</sup> Although Gestalt is bound up with the idea of *experiments* and finding out, of generating knowledge and even explicit laws, rarely is it suggested that these laws operate in exclusion of other types of thoughtful practice. Indeed, Wertheimer is critical of “logic,”

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25 Ibid.

26 Ibid.

27 Ibid.

28 Ibid., 238.

29 Ibid., 141.

for example, and the way in which it places the world into causal relations. He challenges the practice of making connections (a priori) before the world of object-relations has demonstrated a fuller potential toward other kinds of structural relations and interconnections (a posteriori). He is all for grasping a situation as it happens and making sense of it afterwards, concluding that: “Central to the theory is the transition from piecemeal aggregation, superficial structure, to the objectively better or adequate structure.”<sup>30</sup>

Revisiting Wertheimer’s work, we can start to appreciate the way in which the laws of Gestalt are intended to offer summaries of human tendencies. They are offered tentatively at first, based on observations of subjects within the controlled conditions of a laboratory; they are not simply abstract rules to be followed or imposed. One of the major laws for Gestalt, for example, is the Pragnanz principle. According to Wertheimer’s son, this term refers to a tendency whereby “the organization of the field tends to be as simple and clear as the conditions allow.”<sup>31</sup> This organization, he argues, is undertaken by a human subject — specifically in relation to the object-world that he or she encounters. This world is not constituted as always already autonomous and self-organizing, merely operating in relation to the viewer. In “Laws of Organization in Perceptual Form,” (1923), Max Wertheimer is very much present in the text, describing himself standing by a window. He clearly indicates that he cannot order the world exactly as he pleases but that he is subject to a tendency in human perception (and the arrangements of his everyday situation) to seek out wholes rather than fragments. “When we are presented with a number of stimuli, we do not as a rule experience ‘a number’ of individual things, this one and that and that,” he notes. “Instead, larger wholes, separated from and related to one another, are given in experience; their arrangement and division are concrete and definite.”<sup>32</sup>

In *Principles of Gestalt Psychology* (1935), Kurt Koffka continues this theme of the shifting relations of perception, describing how both the viewing subject and the object-world are characterized by “shifts towards a minimum of energy.”<sup>33</sup> Building on a fundamental belief in the Pragnanz principle, Koffka then introduces another law of Gestalt—one that Lupton et al. describe in terms of figure-ground relationships. He describes how human perception tends not only toward simplicity, but also toward three dimensions; indeed, we see space filled before we see surfaces and empty planes.<sup>34</sup> However, the emergence of a space filled is ultimately predicated on other conditions in the object-world. Another law of perception states that people see the whole before the part; for example, the page overrides the dot.<sup>35</sup> Koffka describes how “the point is not sufficient to break the homogeneity of the well-defined unit in the visual environment.”<sup>36</sup> This suggests that the forces of uniformity and similarity overcome the other forces at work on the human subject, who is able to resist—for a while at least—the

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30 Ibid., 243.

31 Ibid., 239.

32 Max Wertheimer, “Laws of Organization in Perceptual Form.” In *A Sourcebook of Gestalt Psychology* (1938) 71–88. Reprint Ellis, W., ed. (London: Routledge & Kegan Paul, 1999), 87.

33 Kurt Koffka *The Principles of Gestalt Psychology* 1935 Reprint (London: Routledge & Kegan Paul, 1955), 250.

34 Ibid., 115.

35 Ibid., 149–50.

36 Ibid., 149.

37 Ibid., 154.



force of non-homogenous elements. Equally, proximity produces the same kind of forces as homogeneity; things that are brought closer together (or closer to the viewer) “overwhelm” the “discontinuous” and “non-unified” forces.<sup>37</sup> Finally, closure has a strong effect on the viewer. Closure, states Koffka, leads to a consideration of the foreground over the background, which tends to bleed away from view. Indeed, circles are an idealized form—they have “good shape”—because they contain the world and thus hold the viewer in place.<sup>38</sup>

Clearly Koffka presents an argument for the control and management of such forces (of closure and homogeneity), although there is a strong indication in Koffka’s and Wertheimer’s writing that the same elements can lead to an experience of dislocation and interruption. While these teachings of Gestalt might advocate the production of an integrated worldview and promote a holistic attitude toward visual perception, in the process of discovering the rules, the teachers are forced to acknowledge the possibility of a different world order. In this respect, the theory is simultaneously dogmatic and problematizing. Gestalt operates with a preference toward completion and closure in the visual field, but in the process of mapping its isometric relations, there is an acknowledgement of shifting states of awareness and organization (a “before” and “after” mapping). Implicitly, there is a place for non-relations, for the non-emergence of forms, and for other kinds of forces to come into play. Indeed, Koffka discusses how Gestalt is interested in “the discovery of the forces which organize our environmental field into separate objects.”<sup>39</sup> This is the focus of his research, yet this does not preclude a wider range of forces—cultural and historical—from entering the picture. These early Gestalt psychologists see themselves as operating within a specific discursive arena, countering one type of understanding with another. Koffka et al. have a strong sense of locating an underbelly of experience that has been overlooked by prior modes of understanding the world; they are advocating the “psychophysical.”

In this way, the Gestalt pioneers ask the reader to pay attention to the *quality* of objects and their interrelations, proposing that changes to “in and to” object-worlds lead to changes in human experience. States Koffka, “Functionally, space is never purely visual.”<sup>40</sup> This point is significant because it highlights the way in which the laws of Gestalt have been misappropriated and/or misunderstood in the history of graphic design. If Kepes uses them as a way of explaining “the laws of visual organization,” this is not to say that Gestalt offers itself to be appropriated only in this way; this use is merely one interpretation by the designer. While Kepes uses the basic laws of Gestalt to structure his own designs, there is no evidence to suggest that the psychologists themselves affirmed this particular appropriation of their ideas. As the text reveals, Koffka is clear that you can play around with the forces of visual

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38 Ibid.

39 Ibid., 153.

40 Ibid., 122.

perception and that life experiences are never simply *visual*. (At the very least, they are also thoughtful and behavioral.) He argues that Gestalt psychology sees mind, matter, and life as interconnected, offering particular solutions for those who would attempt a fuller integration of their moment-to-moment experience. There is no evidence to suggest that this integration is permanent and unconditional; indeed, it is usually described in terms of contingent and shifting relations. “Before a fact can become a fundamental fact, a setting must have been prepared for which all facts take their more or less prominent places,” says Koffka.<sup>41</sup> This statement suggests that Gestalt is open to a wide range of contexts, even while it asserts the specific context of the subject-object bond of formal relations.

Koffka’s discussion acknowledges, for instance, how a familiarity with forms has a bearing on how they are seen. Although Gestalt theories say that simplicity is more easily read than familiarity, acquired learning—or cultural familiarity—nevertheless has a part to play in our engagement with objects. While *looking* at things is bound up in a complex set of relations, some aspects offer themselves up for easy viewing—as though they adopt formations, can be self-consciously structured, and encouraged to work with the dynamic organizational tendencies of human perception. According to Koffka, “Figures less simple..., however familiar by previous acquaintance and however much practiced in special experiments, were never completed in the slightest.”<sup>42</sup> Thus, we are reminded that Gestalt is not simply a discipline characterized by a set of laws, but a series of observations located in experiments with human subjects. It is a “living thinking” discipline that aims to counter metaphysical abstractions and draw conclusions about the power of shape, color, contrast, and repetitions on the viewing experience.

Strongly conveyed in all these writings is that figure is constantly being lost because the ground is changing; in fact, the only consistent aspect of visual organization made apparent is people’s requirement for order and stability within their unsettled field of relations.<sup>43</sup> Gestalt is offered as a set of observations that have the potential to provide techniques for stability. It presents a range of possible anchorage points to help the human subject, who may be lost in something, to find himself or herself again: simplicity, 3D (or “visual depth”), homogeneity, familiarity, similarity, and proximity. It is a method of solving the problem of a potentially chaotic world and life experience—one that encourages us to look back and assess the “requiredness” of our journey and to identify a point of departure and arrival. Gestalt invites the human subject to develop some kind of awareness of the original conditions and their structural relation to the outcome. And the forces at work are not only formal; these are merely the forces that early Gestalt psychologists tend to focus on.

### **Gestalt as Therapy**

In *Gestalt Psychology in German Culture* (1995), Mitchell G. Ash

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41 Ibid., 125.

42 Ibid., 147.

43 A good example of this concession to lost ground and an individual’s inability to remain in control of what is perceived is Max Wertheimer’s discovery of the phi phenomenon in 1912. This phenomenon knows no object; it is merely an illusion of movement created at the interstices between a viewing subject and an unstable, uncertain, and partially occluded outer world. For a fuller discussion, see Robert M. Steinman, Zygmunt Pizlo, and Filip Pizlo, “Phi is not beta and why Wertheimer’s discovery launched the Gestalt Revolution” *Vision Research* 40 (2000): 2257–64.

describes how Gestalt psychology has more than one aspect to its development. In addition to its character as a natural science (previously outlined), Gestalt psychology harbours a philosophical side as well. Ash outlines Wertheimer's interest in Philosophy, how he was "inspired" by the work of Christian von Ehrenfels and Edmund Husserl's *Logical Investigations*.<sup>44</sup> He describes how Koffka studied Philosophy at the University of Berlin and how his interest in daily life and detailed observations of the everyday world led him to pursue the emergent discipline of Psychology. Turning away from the abstract formulations of the metaphysicists (who were all mind and no body), Koffka states that: "I was too realistically minded to be satisfied with pure abstractions."<sup>45</sup> Indeed, it is only Kohler who trained exclusively as a scientist, studying Mathematics and Science before moving to Berlin in 1907 and pursuing a career in Experimental psychology.<sup>46</sup>

Ash describes how Wertheimer, Koffka, and Kohler worked on laboratory-based experiments together in Berlin in 1910 and 1911.<sup>47</sup> While these experiments related to physical perception and human behavior, they were informed by concepts that drew on a range of philosophical dispositions.<sup>48</sup> States Ash, "There was a dispute about how to construct a science of sensation, based on deeply conflicting philosophical commitments, styles of theorizing, and investigative strategies."<sup>49</sup> They were united, however, by a belief that there is more to seeing than passive internal responses to external stimuli. They agreed that "structured wholes" are presented to consciousness via a complex viewing relationship; it was never a matter of action and response. (Their argument was for humans as mediators, for humans being *in* the world). The viewer is seen to be an active component in the process of visual perception, constructing figures out of a total perceptual field. As Ash highlights, for these Gestalt pioneers, "the entity that results from the knowledge process depends in many respects not only on the object, but also on the observer."<sup>50</sup>

Ultimately, as Ash demonstrates, the early psychologists took Gestalt in different directions—a clear indicator that there is more to Gestalt than scientific objectivism and cultural indifference. Wertheimer, for example, moved toward cultural anthropology and ended up writing a treatise on "creative thinking." Indeed Kepes himself could also be understood as taking Gestalt in particular directions. At turns, he works with Gestalt as a natural science, reproducing Kohler's diagrams and Koffka's pronouncements on the visual impact of proximity and similarity on the viewing subject.<sup>51</sup> At such times, he is consciously building toward a methodology for design—one predicated on visual organization and plastic grammar. At other moments, Kepes works with the philosophical undercurrents of Wertheimer's approach, focusing on the effect of the contemporary social world on the human subject and asking: Is there more to life than this?<sup>52</sup> Kepes displays great attentiveness, concern, and care for the plight of humans, noting that:

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44 Ash, *Gestalt Psychology in German Culture 1890–1967*, 108.

45 Koffka, 108.

46 *Ibid.*, 108–9.

47 *Ibid.*, 120–1.

48 The Gestalt psychologists undertook motion and light studies, for example.

49 Mitchell G. Ash, (1988) *Op. Cit.*, 102.

50 *Ibid.*, 124.

51 Gyorgy Kepes, (1995), *Op Cit.*, 44–54.

52 *Ibid.*, 12–4.

One cannot bear chaos in one's psychological space any more than one can bear chaos of the optical impacts of geographical space. Man organizes the optical chaos by forming meaningful spatial wholes. So does he organize the chaos of his psychological space, by forming visual images of his desires, temporary equilibriums in the perpetual conflicts of pleasure and reality.<sup>53</sup>

Kepes advises artists and designers about the need to generate therapeutic social effects, helping people overcome cultural chaos and disorder via the production of appropriate visual forms.<sup>54</sup> He makes specific references to the living situations of his time, including the rise of commodity culture,<sup>55</sup> the prevalence of "inhuman conditions,"<sup>56</sup> the ubiquity of "social contradictions,"<sup>57</sup> and contemporary beliefs about war and economic crises.<sup>58</sup> Indeed, *The Language of Vision* is actually an argument about design as therapy; it is a manifesto for social change through positive visualization. In this regard, Gestalt is being practiced as a therapeutic philosophy and not simply as a natural science predisposed toward structure and order.<sup>59</sup> Kepes states that:

Today, the dynamics of social events ... have compelled us to exchange a static iconography for a dynamic one. Visual language must thus absorb the dynamic idioms of the visual imagery to mobilize the creative imagination for positive social action, and direct it toward positive social goals.<sup>60</sup>

In "Writing Lessons: Modern Design Theory" (1988), Lupton admits that: "Kepes's book thus begins with the isolation of visual form from its linguistic and cultural contexts, and culminates with a hopeful reintegration [sic]."<sup>61</sup> Yet, she ultimately settles for an established teleology, arguing for the progressive evolution of a visual language and grammar in graphic design. She says that, "Despite this final synthesis, however, abstraction remains the guiding force of Kepes's theory [sic]."<sup>62</sup>

Such a reading ultimately underplays Kepes's humanistic approach and, in particular, the degree to which it was informed by the same principles of Gestalt. Historians and critics in the field of Graphic Design are advised to question this automatic dependence on a reading of Gestalt as always-already a science and as an ahistorical and acultural approach to visual communication. This interpretation overlooks the experiential concerns of Gestalt—specifically its interest in human subjectivity and the production of positive and helpful visual effects.

In 1929, one of Wertheimer and Kohler's "brightest students" was invited to lecture at the Bauhaus; among those in attendance was Paul Klee.<sup>63</sup> Between 1930 and 1931, Count Karlfried von Durckheim ran a course on Gestalt at the same institute; this time

53 Ibid., 194.

54 Ibid., 194–6.

55 Ibid., 194.

56 Ibid., 202.

57 Ibid., 204.

58 Ibid., 12.

59 Similarly, Michael Golec argues for the hybrid nature of Gyorgy Kepes's *Language of Vision*, seeing the primer as an amalgamation of Charles Morris's semiotics and positivism, the logic of Rudolf Carnap, and the theoretical writings of Hermann von Helmholtz on vision (to name but a few). Michael Golec, "A Natural History of a Disembodied Eye: The Structure of Gyorgy Kepes's *Language of Vision*." *Design Issues* 18:2. (Spring 2002): 3–16.

60 Ibid., 14.

61 Ellen Lupton (1988), Op. Cit., 1.

62 Ibid.

63 Brett D. King and Michael Wertheimer. *Max Wertheimer and Gestalt Theory* (2005) Reprint (New Brunswick: Transaction Publishers, 2009), 158.

64 Ibid., 158.

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65 See Julia Moszkowicz, "Phenomenology and Graphic Design Criticism: A Re-evaluation of Historical Precedents" (PhD dissertation, University West of England, 2009).

66 Frederick Perls, the founder of Gestalt Therapy, acknowledges these hybrid origins of the discipline. He describes the intellectual climate of Berlin in the period in question. See Frederick Perls quoted on, "Frederick Perls: A Life Chronology," *Gestalt Therapy*. <http://www.Gestalt.org/fritz.htm> (accessed May 23, 2010).

Wassily Kandinsky and Josef Albers were in attendance.<sup>64</sup> In 1954, Gyorgy Kepes designed the cover for Rudolph Arnheim's text, *Art and Visual Perception*. These events are evidence of a strong and undeniable link between Gestalt psychology and the teaching of art and design in the early part of the twentieth century. However, what they fail to disclose is the diversity of ideas and approaches within the discipline. Gestalt is not simply a science of visual organization (with fixed laws) but also a set of concepts with philosophical and therapeutic dispositions toward the state of human subjectivity.<sup>65</sup>

### Conclusion

I've argued in this paper that there is a strong and undeniable link between Gestalt psychology and the teaching of art and design in the early part of the twentieth century, specifically in the work of Gyorgy Kepes in the *Language of Vision*. Gestalt is a complex discipline with diverse philosophical, scientific, and social orientations. As indicated, both Wertheimer and Koffka had studied Philosophy and read the work of the phenomenologist, Edmund Husserl. Indeed, Gestalt psychology emerged at an exciting historical moment, when a diverse range of voices, interests, and disciplines collided.<sup>66</sup> The work of Gyorgy Kepes can be usefully re-read in the context of this collision, whereby Gestalt can take many turns: scientific, humanistic, mechanistic, and therapeutic.

The diverse individuals, institutions, and ideas—discussed under the nomenclature of Gestalt—are linked by a shared interest in experimenting with perception and making direct observations from human experience. Despite these connections, however, Gestalt has been consistently characterized—within the field of Graphic Design History and Theory—as a unitary science with abstract and unchanging laws. As this paper has demonstrated, such a reading of Gestalt is grossly oversimplified; it is an interpretation that is predicated on the practice of taking Gestalt theory out of its original (and ongoing) contexts. As Roy Behrens and Mitchell G. Ash have shown, Gestalt is a populated and variegated theory—one that has humanistic as well as experimental aspects. This paper has added to this re-appraisal of Gestalt by revisiting and re-reading the texts of its early pioneers, specifically Max Wertheimer and Kurt Koffka. Their work demonstrates a strong interest in social, historical, and therapeutic relations, in a way that overturns the dominant reading of Gestalt as an "autonomous" scientific theory. As the work of Gyorgy Kepes further reveals, Gestalt is about people (not just forms) and human tendencies (not just spontaneous brain functions). If only it were reinterpreted in this way...

# Indigenous Knowledge and Respectful Design: An Evidence-Based Approach

Norman W. Sheehan

## Introduction

As an Aboriginal educator and researcher, my work in Aboriginal cultural contexts is situated among the most gifted and productive population of artists, storytellers, and performers. This creativity is amazing, considering that the life conditions of Aboriginal people in Australia are among the worst in the world. A conception of this disadvantage can be seen in the life expectancy of Aboriginal peoples living in Queensland, which is 20 years less than the Australian national average. At present, we are conducting design-based social and emotional well-being research projects with Aboriginal community groups in partnership with Link Up Queensland.<sup>1</sup> As an Indigenous Knowledge (IK) academic, I work in design because design fits well with the visual and narrative basis of Australian Aboriginal cultures. Ethical frameworks for research in Indigenous contexts require participant-level engagement because we work with populations trying to recover from generations of violation.<sup>2</sup> Healing in this context is a trans-generational project to re-dress health inequity.<sup>3</sup> The social and emotional well-being of Aboriginal communities is a fundamental component of this objective, which suggests that visual and narrative approaches are essential methodologies.<sup>4</sup>

The term “respectful design” emerged from my contributions to Faculty of Design planning at Swinburne University of Technology. Although the phrase “respectful design” has some promise across the field of design, I present the IK approach described in this paper to promote a more socially responsible and environmentally engaged vision.

## Indigenous Knowledge and Respectful Design

IK is a layered understanding that includes divergent streams of knowledge related within natural systems. IK generally is ontological because inquiry is situated within an intelligent and intelligible world of natural systems, replete with relational patterns for being in the world. IK understandings arise in partnership with these existent and sustaining patterns of relation.

IK encompasses many divergent traditions that share many similarities; however, the most common shared thread of

- 1 Australian Bureau of Statistics (ABS), Australian Institute of Health and Welfare (AIHW), *The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples*, (Canberra: Commonwealth of Australia, 2008), 152–82.
- 2 Mick Gooda and Jenny Brands, “Putting the Users of Research in the Driver's Seat: The CRCaH's New Approach to Research Development,” *Australian Aboriginal Studies* 2 (2006), 32. Deborah B. Rose, “Rupture and the Ethics of Care in Colonized Space,” *Prehistory to Politics: John Mulvaney, the Humanities and the Public Intellectual*, ed. Tim Bonyhady & Tom Griffiths (Carlton Vic, Melbourne University Press, 1997), 190–2.
- 3 Ian Anderson, Fran Baum, and Michael Bentley, *Beyond Band-aids: Exploring the Social Determinants of Aboriginal Health: Papers from the Social Determinants of Aboriginal Health Workshop, Adelaide, July 2004*, (Darwin NT: Cooperative Research Centre for Aboriginal Health, 2007).
- 4 Norman W. Sheehan et al., *Sustaining Connection. A Report into the Community, Spiritual, Social and Emotional Well Being of Aboriginal and Torres Strait Islander Citizens in Queensland* (Herston: University of Queensland, Advances in Mental Health, 2009).

IK is the experience of colonization.<sup>5</sup> Direct experience of colonial devastations has situated IK as an incisively critical and resilient ideology.<sup>6</sup> Colonization is very similar, regardless of context, because it is a recurrent action that implacably sweeps others and their understandings from the landscape. Colonial movements rend the world open for exploitation, establish zones of social and material entitlement, and routinely deny responsibility for subsequent social and environmental trauma.<sup>7</sup> As production-centered cultures expand, climates change, and as the social and environmental consequences of these movements impact on the world, an increasing number of groups experience this destruction.<sup>8</sup>

IK operates from the assumption that the world is alive and active in the same way that humans are alive and active. Respect is based on this ancestral understanding that we all stand for a short time in a world that lived long before us and will live for others long after we have passed. From this view, we can never know the full implications of any action; thus, IK respect is about showing care and awareness in the way we identify, explore, and assess meaning because we know our view is always incomplete. In some contexts, Indigenous respect is a productive inaction, where we remain still to observe the shifting patterns of others as a basis for future life-affirming action.

Indigenous respect preserves difference opposition and division in the knowledge that we all inhabit a living mutualism. In this sense, respect is a situated awareness that establishes clear demarcations so that responsive communications are made possible between opposing factors.<sup>9</sup> IK recognizes that natural systems intelligently respond to our violating acts and have the power to moderate human agency by making the world less livable for us. Respect involves a generationally deep observation of relations between humans and the movement of natural systems. It also involves a refusal to become the same as the oppressive powers that control our lives. This respect works because we know that natural systems are life-positive relations that make the world more alive and livable if groups make the correct choices. In this sense, Indigenous respect is an ontological learning principle that does not seek or propose an ultimate truth. Instead, IK seeks to identify positions that support life-affirming patterns embedded in our “being-with” the natural systems of which we are a part.

IK accepts that diversity is the basis of creativity and adaptation; therefore, it does not strive to convince others to become the same. Instead, IK proposes autonomy as a general principle. Autonomy generates a more complex, reflexive, and adaptive organizational state through individuated and diverse responses than could be achieved through any imposed understanding or central locus of control.<sup>10</sup>

Respectful Design presents the challenge of addressing natural systems by thinking more deeply, divergently, and connec-

5 Erica-Irene A. Daes, “Prologue: The Experience of Colonization Around the World,” in *Reclaiming Indigenous Voice and Vision*, ed. Marie Battiste (Vancouver, BC: UBC Press, 2000), 3–8.

6 Taiaiake Alfred, *Peace Power and Righteousness: An Indigenous Manifesto*. (Ontario: Oxford University Press, 1999), 10–23. Leroy Little Bear, “Jagged Worlds Colliding,” in *Reclaiming Indigenous Voice and Vision*, ed. Marie Battiste (Vancouver, BC: UBC Press, 2000), 77–83.

7 Norman W. Sheehan et al. “Denatured Spirit; Neo-colonial Social Design,” in *The Havoc of Capitalism. Publics, Pedagogies, and the Environmental Crisis* Gregory Martin et al., (Boston: Sense Publishers, 2010), 112–4.

8 Anthony J. McMichael, “Climate Change in Australia; Risks to Human Well-being and Health,” Nautilus Institute Austral Special Report, 2011. <http://www.nautilus.org/publications/essays/apsnet/reports/2009/australia-health.pdf/view> (accessed April 14, 2011).

9 Deborah B. Rose, *Dingo Makes Us Human. Life and Land in an Aboriginal Australian Culture* (Sydney: Cambridge University Press, 1992), 223–35. Norman W. Sheehan, “Indigenous Knowledge and Education; Instigating Relational Education in a neo-Colonial Context” (PhD diss., University of Queensland, 2004), 133–42.

10 Rose, *Dingo Makes Us Human*, 223. Sheehan, “Indigenous Knowledge and Education,” 133.

tively through design. The IK conception of Respectful Design is not based on what design is, what design does, or what design means; it is founded on how design positions itself in relation to natural systems and the social world. When informed by IK, Respectful Design is an aspiration for a deeper situational awareness that generates many divergent spaces where innovation can contribute positively to the well-being of the whole.

In my limited understanding, design is the active human intersection between materials products, social interactions, and environments; therefore, design occupies a pivotal position for any change in cultural direction. In modern society, design is central to production-oriented culture—a position that limits and directs design possibilities. Despite this control, design continues as a universal human process of engagement with the world through materials culture utility and possibilities. Design has always shown respect for the outside appearance of things because design acknowledges the “interior” social and cultural significance of utility. Respectful Design requires a slight shift in this conception, so that design learns to inform material and social production concerning the “inside” cultural shifts that enable life-affirming utility with the “outside” world of natural systems.<sup>11</sup>

### Visual Dialogue: An IK and Respectful Design Method

Deep equity is the inclusion of all identities, features, and factors because they are assumed to be equally aware, alive, and capable of voicing their concerns. In IK terms, deep equity requires methodologies that devolve the inherent power of leadership and equalize engagements across the research context. This stand may be contested, but if we adopt this position as a first step, our dominance over the context is minimized, and data are less centered on designer/researcher assumptions, projections, and desires. In this sense, the bias of IK research is toward deep equity as an informational holism for human subjects and the environments we inhabit. Dialogue, or “yarning circles” as they are known in Aboriginal vernacular, provide the equal sharing space where deep equity can be achieved. This space presents a challenging learning context, particularly in western knowledge contexts, because yarning circles are a de-centering initiative, whereas normative pedagogic and research modes codify information, centralize its interpretation, and regulate through its dissemination.<sup>12</sup>

Yarning circles are conducted under the simple rules that each person speaks in turn, holds authority for the time they speak, and reciprocates by speaking responsibly from self and not about others. This simple sequencing structure provides a safe space that enriches the creative potential of a group because, as the speaking role moves, individual statements become more spontaneous, merging and connecting to become an emergent and creative conversation between minds.<sup>13</sup>

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- 11 Tony Fry, “The Role of Design as a Contributor to Innovation, a Submission to the Review of the National Innovation System” (Griffith University, Queensland College of Art, 2008); Johan Galtung, “Cultural Violence,” *Journal of Peace Research* 27 (1990): 292; Sheehan et al., “Denatured Spirit,” 112–4.
- 12 Sheehan et al., “Denatured Spirit,” 111–3.
- 13 David Bohm et al., *Dialogue - a proposal*. (Bohm Dialogue 1992), <http://www.david-bohm.net/dialogue/> (accessed February, 2011).



Visual dialogue is an IK extension to the dialogic system, and it works because design is synonymous with human being in the world. In the same way that birds are related and continue through “nest,” humans are related and continue through “design.” The opportunity presented by this ontology is that visual dialogue can be conceived as an approach that investigates cultural, social, and environmental practices through visual and interactive processes embedded in the *being-with* of human groups. This approach fits well with the visual philosophy of IK, wherein making and sharing images is a deeply productive interaction—with each other and the world—that conveys significance and engages us relationally within the original shared cognizance of all “things.” The IK conception of an original shared cognizance is often referred to as the [Dreaming].<sup>14</sup>

Images position humans to view together and share explanations so that we can understand them. This relational agency establishes and maintains visual significance through cycles of revisitation and observation-learning. In this way, visual images not only draw relations “in;” they also “hold” relations together because images culturally connect the visual, cognitive, social, and pedagogic systems. Through visual philosophy, design is apprehended as an external mind that depicts the mobile and evolving shared consciousness of a collective. In this view, design is not just a process that produces new objects, changed situations, or enabled futures; it is *the* connective process that constitutes externalized cognition. The opportunity that production-oriented cultures miss is the one for informative engagement within natural systems relations, through the shared consciousness provided by visual philosophy.<sup>15</sup>

Visual dialogue is a versatile education and research program that commences with a simple design problem and a routine that prompts groups to engage in a range of interactive exchanges and negotiations that lead to a solution. The first stage in these examples involves the creation by participants of a drawing on a card; the card connects with a simple edge register pattern so that when a card is arranged next to the other cards, a whole group pattern emerges. The difference between dialogue and visual dialogue is that the visual arrangements are negotiated through movements, without speaking. The researchers usually start the visual dialogue and explain the routine once, and then let “divergences” and “mistakes” become part of the free play, with images prompted by the routine. This freedom creates many possibilities that produce many layers of information. The following brief examples illustrate the potential of this approach.

## Two Perceptions

In this visual dialogue routine, undergraduate participants were divided into groups to draw on cards and silently arrange the cards into a final pattern. Four participants were situated as observers and

14 Martin Ries, “Braque’s Ateliers and the Symbolic Bird,” *Journal of Aesthetic Education* 29:2 (1995), 23, <http://www.martinries.com/article1995GB.htm> (accessed April 14, 2011) Gaston Bachelard, *The Poetics of Space*, trans. Maria Jolas (Boston: Beacon Press, 1994), 170–93. Sandra Le Brun Holmes, *Yirawala, Painter of the Dreaming*. (Sydney: Hodder & Stoughton, 1992), 23–93; Sheehan, “Indigenous Knowledge and Education,” 61–5.

15 Alfred Gell, *Art and Agency; an Anthropological Theory*, (New York: Clarendon Press, 1998), 221–73; James Leach, “Differentiation and Encompassment. A Critique of Gell’s Theory of the Abduction of Creativity,” *Thinking Through Things: Theorising Artefacts Ethnographically*, ed. Amiria J. M. Henare, Martin Holbraad, and Sari Wastell, eds. (Routledge, UK: Abingdon, 2006), 177–83; Gregory Cajete, *Native Science, Natural Laws of Interdependence* (Santa Fe: Clear Light Publishers, 2000), 13–43. Sheehan, “Indigenous Knowledge and Education,” 102–13.

asked to record the negotiating movements of the cards and focus on any emergent images that occurred. The final arrangement of one group was in categorical order from left to right. The observer stated that the group broke the rules because only two participants made most of the rearranging moves. These moves tended to continually group the relational designs according to the internal structural qualities; thus, they involved a struggle for inclusion that centered on the divergent appearance of one particular card.<sup>16</sup>

The observer said that she really loved the final arrangement of the design because of the little “bird” shape that emerged in the central four cards. To the observer, the little bird appeared to be fluttering out from the “cage” structure on the right toward the “foliage” on the left. This observation was a surprise to the group because no one perceived the bird image during the negotiations, but the image was immediately apparent to everyone as soon as it was mentioned. From the group perspective, this bird image was a potent and emergent narrative that arose from the exclusion/inclusion struggle between two participants and included both of their cards. This group routine demonstrated not only that emergence is possible within a material context, but that it can be the most significant learning experience in that context. The image also mediated the conflict in the group because a simple image and potent message emerged from the conflict and amazed everyone.

### Breaking Rules

In the second example of visual dialogue, the final assessment task for a group of student teachers was to complete a connective design on a card and write a single word on the back that expressed a deep equity principle. Half the group was delayed, so those present were set the task of arranging their cards without showing each other the words written on the back; thus, they set a visual dialogue routine for the rest of the group to complete when they arrived. When the late arrivers were invited in, they were shown a large circle of colorfully drawn cards loosely arranged around a central card placed on a sheet of paper. The task given to these participants was to rearrange the cards in relation to the four themes written on a sheet of paper and then to reveal the words written on the back of each card. The second group of students did not connect the cards either; they left the same card in the center of the arrangement, and they rearranged all the other cards into four smaller circles around each of the four themes. Then they called the others back in, turned the cards over, and read out the words in sequence. In this double blind exercise, the amazing result was that, with very minor adjustment, the cards made cogent sentences that fitted with the assessment task and the themes (words added are in italics).

- Risk *the* compassion of unconditional love.
- Respect *and* honor non-judgmental relationships.

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16 Sheehan, “Indigenous Knowledge and Education,” 304–35; Norman W. Sheehan and Ian Lilley, “Things Are Not Always What They Seem: Indigenous Knowledge and Pattern Recognition in Archaeological Analysis,” *Collaboration in Archaeological Practice. Engaging Descendant Communities*, ed. Chip Cowell-Chanthaphonh and Thomas John Ferguson (New York: Altimira Press, 2007), 93–103.

- Inclusive values of imagination, humility, and freedom in the seen and unseen world.
- Integrity is the foundation of identity in mutual belief.

One of the participants described the experience in this course as learning how to build a small culture in a room using images and then being shown how to work with others in a group to operate this “culture;” thus, knowledge emerged from group interactions as in a conversation with unseen intelligence.<sup>17</sup>

### Just the Spark

The Sustaining Connections project provides training for facilitators in the visual dialogue process and then supports the development of connective art workshops in Aboriginal communities across Queensland. Responses to this project have been positive; one small rural community completed the project months ahead of schedule, with exceptional outcomes. Initial reports from participants stated that the program was just the thing people were waiting for. It is difficult for us to imagine the levels of marginalization experienced in these communities, but the comments offered by a social and emotional well-being worker in support of the project show how significant even small cultural instigations can be: “Many people here keep out of sight in their houses because, out here, life is easier if they just keep to themselves. The project got people out and got them together for a positive, self-identifying experience—something valuable to them—and a really strong, creative group emerged.”<sup>18</sup>

The paintings produced by this group connect together to produce a large mural that will be digitally recorded and exhibited. From these early results, it seems that the simple, connective structure is a spark that can spur cultural innovation toward social cohesion among marginalized groups.

### Engaging Natural Systems

The obvious question that arises in relation to these examples is this: Where is the natural systems engagement in these IK processes? This question reveals a peculiar trait of western/modern societies, which assume that natural systems must be controlled or excluded to enable civilized stability and order. Following from this assumption, engagement with natural systems requires a visitation with untouched traditional, wild, or sacred places or understandings “outside,” somewhere far away from civilization. Given the reality that all humans are natural systems, biologically enmeshed in the environment, and that, even in the most sterile or contaminated places, growth emerges and challenges human control, this assumed separateness is highly suspect.

IK accepts that natural systems relations are a constant, like gravity always connecting an incredibly diverse potential for growth in all contexts, regardless of disturbance. One difference

17 Sheehan, “Indigenous Knowledge and Education,” 333–56.

18 “Sustaining Connections Art Initiative,” Link Up Queensland, <http://www.link-upqld.org.au/art.html> (accessed April 14, 2011).

between western and Indigenous knowledge is that emergence is generally accepted in IK as a feature of natural system relations and that it demonstrates that we are working respectfully with these relations. In this sense, natural systems relations are the “gravity” of our biosphere, and creative emergence in its innumerable forms signifies the relational gravitas, the dignity and intelligence, of this systemically alive world.<sup>19</sup>

In a visual dialogue held in a small inner city park, one student observed that when Uncle David (an Aboriginal elder) started to speak, a kookaburra flew up and perched on a branch right above his head. The bird stayed still, looking down until he finished speaking, and then flew away. The student was amazed that this occurred, amazed that the indigenous participants saw this as a normal event, and amazed that none of her colleagues noticed the bird. Culture provides the framework in which we operate, and each cultural framework promotes and maintains assumptive structures that define our understanding of the world, the way we perceive in our shared contexts, what is possible, and what we expect to happen when we act. In visual dialogue, knowledge often emerges and fits with the actions and intent of groups. This outcome is not magic and special; it is simply inherent to the structure that a visual and relational outcome will emerge from a visual and relational process in a way that reveals a visual and relational world. The most significant outcome of visual dialogue is that it experientially demonstrates that a change of assumptive framework also changes outcomes in ways that challenge normative expectations.

Visual dialogue is most valuable because the structure of learning/inquiry promotes emergence, and this approach negates normative concepts of power and control. Indeed, the teachers/researchers are often marginalized in the most positive way because participants and the context cannot be rendered passive or assumed to be inert. In this way, visual dialogue is a training model for cultural innovation because it demonstrates that when the assumptive basis changes, so does everything else. Visual dialogue is a deep activism because it goes beyond political contestation and resistance to reveal and play out cultural assumptions; thus, everyone experiences the influence that assumptive structures have in everyday practice.

### **Envisioning Respectful Design as an Evidence-Based Approach**

The continuing health inequity of Aboriginal Australians demonstrates the immense difficulty societies have identifying and addressing problems that originate in their own marginalizing processes. Good evidence is not possible in many of these contexts because the best evidence is often socially unacceptable.<sup>20</sup>

In many social, institutional, and corporate contexts, evidence is implacably entwined with power and control. In settler societies, attitudes and processes that skew evidence are deeply ingrained

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19 David Bohm, *Wholeness and the Implicate Order* (London: Routledge and Kegan Paul, 1989), 62–73. Sheehan et al. “Denaured Spirit,” 101–3.

20 Richard G. Wilkinson and Michael G. Marmot, eds., *Social Determinants of Health: the Solid Facts*, (Oxford: Oxford University Press, 2006), 12–34; Michael P. Kelly et al., *The Development of the Evidence Base About the Social Determinants of Health* (Geneva: World Health Organisation, Measurement, Evidence Knowledge Network, 2006), 4–23; Sheehan et al., *Sustaining Connection*, 93–102.

especially within the institutional systems that seek to redress Aboriginal disadvantage.<sup>21</sup> Conflicting data are also fabricated through politically sponsored counter-research that supports many forms of exploitation. EBR must be well defined because it should be open to contestation; however, in many critical zones, even the best evidence is systemically and intelligently undermined. If design seeks to become respectful in a manner informed by IK, then design needs to reconfigure the evidence base to reveal and explicate ideological bias and systemic cultural resistance.<sup>22</sup>

EBR, by definition, operates in contexts that are not unknown but require reevaluation to monitor situational change, often using new methods for inquiry. This reevaluation presents some difficulties; for example, the word “evidence” is easily misrepresented and might be taken to mean information presented as a basis for judgment within a fundamentally public and political debate. This allows competing forces to play on and obscure research in critical contexts (e.g., the environment), stalling responses to pressing concerns and resulting in a general anxiety. In this sense, defining the evidence base as *the most accurate and current knowledge of the situation or context* is essential because it provides the certainty required to support community well-being, in contexts where problems affect everyday life.<sup>23</sup>

EBR as it is understood in health inequity is based on principles for best evidence identification. Adapting these EBR principles to identify a best evidence-based practice for Respectful Design opens up a distinct stream of methodological development informed by the IK conception that design is ontologically human. This proposal presents design with elemental tools that may assist methodologically in the development of a design standpoint that acknowledges our inter-reliance embedded within natural systems.<sup>24</sup>

#### *Equity Comes First*

The primary value underpinning EBR is a deep commitment to equity. This principle is not scientific and rationally derived; it is, instead, a value position asserting that everyone in a population has a right to information that is accurate, meaningful, relevant, and understandable. This value position is derived from social determinants research that directly relates inequity to poor health through practices that are unfair, unjust, and disempowering. Equitable research is necessary because there is a direct correlation between good data, the equality of all participants, and informed and empowered action. This value contrasts with arguments asserting that differences in social and environmental awareness are a consequence of informational complexity; cultural differences; or disinterested, resistant, and backward communities. IK informs us that an explanative gap between researcher and participant population is a methodological failure that seeds vulnerability.

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- 21 Mick Dodson, “Bully in the Playground: A New Stolen Generation,” in *Coercive Reconciliation. Stabilize, Normalize, Exit Aboriginal Australia*, eds. Jon Altman & Melinda Hinkson (North Carlton Victoria: Arena Publications Association, 2007), 85–96; Michael Mansell, “The Political Vulnerability of the Unrepresented,” in *Coercive Reconciliation. Stabilize, Normalize, Exit Aboriginal Australia*, eds. Jon Altman and Melinda Hinkson (North Carlton, Victoria: Arena Publications Association, 2007), 73–84.
- 22 Stephen J. Millroy and Michael Gough, *Silencing Science*, (Washington: Cato Institute, 1998), 41–5; Naomi Oreskes and Erik M. Conway, *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming* (New York: Bloomsbury Publishing, 2010), 63–82.
- 23 Sheehan et al., “Denatured Spirit,” 103–9.
- 24 Nigel Cross, “Designerly Ways of Knowing: Design Discipline Versus Design Science,” *Design Issues* 17 (2001), 49–52. Sheehan, “Indigenous Knowledge and Education,” 288–304.

IK proposes that the best basis for evidence in a context is the empowered, informed, and aware inhabitants of that context. Equity is therefore a first principle for Respectful Design.<sup>25</sup>

#### *The Context Is Alive*

The space we inhabit cannot be assumed to be the null void that was contrived as the background for early theory development in the physical sciences. Objects, beings, and the interactions and relations between them generate social and natural spaces. In this sense, social and natural space is alive and has a history and a *feel* that influences all inhabitants. IK recognizes the living quality of space because space exercises a positioning power on us all. Like any living thing, social and environmental space has exterior apparent conditions and internal hidden processes that are essential to the life of the space and all life within. Social and natural environments share these relational dimensions, where the most significant elements are often hidden from view. IK respect is a context-relevant pragmatism required because inquiry must be aware of deeper inter-reliance, especially when so many social and natural spaces have been disrupted, violated, and wounded.

Equity practically situates inquiry within social and environmental space that at the very least has been disturbed by previous acts. Equity is a value position within the mainstream assumptive base; however, in the assumptive base of the colonized, deep equity is a scientific principle because it reinstates the essential connections that make evidence gathering possible and findings authentic. As is evident in the many ethical frameworks devised for research in Indigenous contexts, IK deploys deep equity to foster a safe social space where inquiry can be conceived and owned by the marginalized in ways that contribute to their well-being. In this sense, participants are the only reliable experts concerning their social space, its features, and effective inquiry in this context.<sup>26</sup> Respectful Design focuses on methods that activate this contextual expertise to reveal the informing voices of social and natural systems.

#### *Negotiation Is Good Science*

Respectful design is founded on a belief that negotiation offers the best basis for research design and that dialogue and visual dialogue are very effective forms for negotiation. Research is a relationship-building process across a participation field, where dialogic and visual approaches establish equal negotiations to ensure that “science” (e.g., the necessary concord between the method of inquiry and the features under investigation) is maintained as the primary objective. Design and research are human activities, so it simply is not good science to study other humans from an imagined distance or to examine one group from the assumptive basis of another. Information about a group is not the same as information from a group; humans with different experiences see things differently, and

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25 Kelly et al., *The Development of the Evidence Base*, 4–23; Sheehan et al., *Sustaining Connections*, 93–102.

26 Australian Health Ministers’ Advisory Council, *Cultural Respect Framework for Aboriginal and Torres Strait Islander Health, 2004–2009* (Adelaide, South Australia: Department of Health, 2004); Sheehan et al., *Sustaining Connections*, 93–102.

this difference has immense value for the Respectful Design evidence base. Through visual and dialogic negotiations, Respectful Design authentically cedes ownership of methods in the interest of good human science.<sup>27</sup>

#### *Diversity Is Also Good Science*

EBR demands methodological diversity because no single approach to the collection and analysis of data can be favored over others. The context-independent prioritization of a particular method cannot generate good evidence because fallacies easily emerge and are promulgated when data are evaluated through an imposed evidence hierarchy. Particularly in cross-cultural contexts, the legitimacy of evidence depends on the correspondence between the method and the assumptive context in which it is implemented. Respectful Design appraisal of evidence should address the question of research ownership directly by designing investigations that open up pathways for diverse research partnerships. Best evidence arises from the *researched* when they maintain possession and control of their information, formulate and apply their own language for description and analysis, and engage authentically in ways that provide opportunities for new self-conceptions.<sup>28</sup>

#### *The Whole Truth*

EBR is holistic, not simply because it strives to include the understandings of everyone but because good evidence necessitates whole-system problem identification. The lesson from health inequity is that research must embrace socio-economic, historic, cultural, and environmental issues and must include consequences from the dominance, exploitation, denial, divisive attitudes, disarray, and unexamined negative behavior often apparent in problem spaces. Differences in problem identification expose deeper levels for analysis because the same negative features are often seen from different perspectives as right and good. The holistic approach is vital because it situates Respectful Design so that it intercedes in divisive contexts and productively weaves together views that silence others, views that are silenced, and views disposed to contest the data with findings that authentically emerge and are apparent to all. In this way, the holistic approach strives to render evidence informative, relevant, and useful across all dimensions of a problem space.<sup>29</sup>

#### *Resilient Evidence*

The power of evidence is limited because humans create understandings that are experienced as something more than human products. Thus, many social domains habitually defend assumptive frameworks that influence the way things not yet known will come to be known. Causal pathways often intersect with and potentially undermine beliefs that are deemed essential to individual and group security. A complete understanding of causal pathways requires the

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27 Kelly et al., *The Development of the Evidence Base*, 4–23; Sheehan et al., *Sustaining Connections*, 93–102.

28 Ibid.

29 Ibid.

suspension of judgment so that all assumptive frameworks may be equally related as key informing elements of a problem space.

Communicating diverse evidence without judgment creates space for groups to self-identify assumptions that are methodologically causal. This de-centering aspect of Respectful Design produces resilient evidence because the refusal to judge other beings and the ability to equitably represent even those things we may see as aberrant preserves divergent views and deepens the engagement of all participant groups. This ontological equality also provides opportunities to redefine our conception of evidence, maintains the different views necessary to address extreme subtlety and complexity, and increases the persistence of evidence across divisive contexts as an independent and enduring influence.<sup>30</sup>

#### *Sustainable Evidence*

Evidence must exhibit descriptive growth and flexibility because societies and cultures are fluid, dynamic processes, and causal factors are also shifting and changing. Planning for sustainable evidence means considering the extent to which the evidence represents the living and dynamic relations and tensions in the research context. Equity negotiation and non-judgmental inclusion present Respectful Design with an opportunity to embed dynamic social variations and differences into evidence. In the interest of sustainable evidence, it is essential that design must respond to these dynamics as a whole because, together, they constitute a fluid interactivity that can be disturbed, ignored, or harnessed.

Research findings are generationally embedded in social dynamics that often automatically render those findings redundant or irrelevant. EBR cannot be a transient fashion or trend. Through Respectful Design, evidence has the potential to become sustainable because it is re-conceived and positioned as a companion movement, embedded through cultural innovation into the long-life of social groups.<sup>31</sup>

In the same vein, societies are aware that we can no longer assume that the world is a passive reservoir of mere resources that “appear” as material in our products and that “disappear” when utility has ceased. In IK terms, everything in natural systems is alive because we all have entwined and interrelated origins and destinations. Respectful Design ultimately involves the life-cycle design of “material” as a cultural innovation embedded within production, so that progress can be reconceived as a companion movement within natural systems.

#### *Explicate Bias*

All research methodologies are cultural artifacts; therefore, bias is more or less present in all data. An imperfect solution is to acknowledge this fact and to determine the effect that bias has on data selection, analysis, interpretation, and the communication of

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30 Ibid.

31 Ibid.



findings. In doing so, we cannot assume that an underlying truth free of bias exists. Bias is a pathological condition in some contexts, established in terms of “for,” “against,” “neutral,” and many other socially approved positions that have been adopted in relation to certain others and their understandings. Indeed, bias may inhabit and inform a group’s conception of reality, rewarding abhorrent acts against human and natural systems.

Regardless of the assumed or actual veracity of these different positions and the validity of arguments applied to them, it is the very sense of entitlement to assess, contest, and decide “truth” for or about “others” that directly correlates to biased evidence. Making decisions about natural systems as if they are “other” is a dangerous form of this pathological bias long recognized by Indigenous peoples as a feature of modern culture. Bias also inhabits the normative structures of research that privilege certain methods for inquiry.

Respectful Design workers must be the first to know, understand, and communicate their biases and make the influence of their perspectives on evidence and products explicit. Finally, the key task of Respectful Design is to implement, test, and refine methodologies that normatively expose and explicate bias.<sup>32</sup>

#### *New Wicked Problems*

Wicked problems arise and prevail in contexts where conflicting understandings exist, data are socially entangled, political imperatives prevail, and epistemic conventions limit problem identification. We might see global warming and Aboriginal health inequity as examples of problems that prevail because they emerge from and are perpetuated by behavior that is integral to social life. Solutions are often seen as a threat in these instances because they reveal social, economic, and behavioral entanglement with the problem. As populations grow and environments change, we can expect a future where wicked problems increase and have a greater effect on individual well-being.

In response, Respectful Design aims to preemptively create spaces for cultural innovation. Cultural innovation happens when a group perceives its’ own assumptive framework and related implications and attempts to generate a responsive adaptation of its own socio-cultural formation. Respectful Design proposes that cultural innovation through many locally co-designed shifts can create new possibility spaces—spaces where embedded problems are newly identified through fundamental and at times co-designed changes to the cultures of inquiry, innovation, and production.<sup>33</sup>

#### **Respectful Design: Respect as a Beginning**

Respectful Design involves the recognition that Indigenous Knowledge (IK) is a case in point for the wicked problems embedded in modern progress. Although IK is often valued as a source for theorizing about human cognitive origins and as a resource for

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32 Ibid.

33 Richard Buchanan, “Wicked Problems in Design Thinking,” *Design Issues* 8:2 (1992), 5–9; E. Jeffery Conklin, “Wicked Problems and Social Complexity,” [http://www.cognexus.org/id26.htm#wicked\\_problems\\_and\\_fragmentation](http://www.cognexus.org/id26.htm#wicked_problems_and_fragmentation) (accessed April 14, 2011); Boyd Hunter, “The Howard Government’s National Emergency in Indigenous Affairs,” *Agenda* 14:3 (2007), 35–7.

product development, it is routinely considered primitive, surpassed, and irrelevant. The origin of this bias can be discerned in the work of the colonial anthropologist, Lewis Spence, who stated that the native mind had no concept of reality because of an inability to distinguish between the animate and the inanimate: "Therefore, the savage imagines every object that surrounds himself to be like himself: instinct with life."<sup>34</sup> For generations, eugenic theory informed colonial practices applied to *aborigines* in Australia, Africa, and the Americas, wherein improvement in the *stock* of humanity and a focus on the commercial value of human life justified implacable actions against these mentally *unfit* and economically *unproductive* others. Vestiges of these assumptions continue embedded in contemporary policy, developmental theory, health research, and societal attitudes.<sup>35</sup>

In a similar way, climate change can be seen as an indicator of an ontological flaw in Western understanding because the supposedly inanimate world/environment is actually responding to human intrusions in ways that are difficult for modern society to grasp. The threatening reality of this view is that modern production-oriented cultures' inability to adjust affirms this ontological flaw as a source of the wicked problems we face. In this critique, Western production-oriented development is described as "scavenger ideology," in which every being and every value eventually is consumed by self-serving production.

In this context IK strives to position Respectful Design where it can intercede as an advocate for a deep equity, where all social and natural systems are seen as equally alive, related, and interdependent. IK continues to present environmental devastation, human rights violations, and health inequity as ontological issues caused by flawed conceptions of being. Respectful Design is informed by the view that respect is a fundamental refuge, and an essential non-violating weapon, in a continuing battle for the well-being of us all.<sup>36</sup>

In Australian Aboriginal contexts, research is traditionally conducted through visual images and narratives, which provides a 60,000-year history of inquiry behind this approach to knowledge. Design and visual techniques work well in research because these processes embody and practically play out the evidence-based principles of Respectful Design already described. In our meetings of the Faculty of Design at Swinburne University, Professor Frank Fisher called for a new lens through which we might see the way to sustainable futures. Respectful Design may show that we already have the lens because the thing we most need to analyze and adjust is our own cultural assumptions. Design is a constant socio-cultural mirror that IK seeks to reposition so that we might shift our view of ourselves to one where the pressing necessity that we design-with natural systems becomes visible.

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34 Lewis Spence, *North American Indians*, (London: Bracken Books, 1992), 80.

35 Angela C. Wilson, "Reclaiming Our Humanity; Decolonisation and the Recovery of Indigenous Knowledge," in *War and Border Crossings: Ethics Where Cultures Clash*, ed. Peter A. French and Jason A. Short (Oxford: Rowman and Littlefield Publishers, 2005), 255–8; Emily Jane Wilson, *Eugenic Ideology and Racial Fitness in Queensland, 1900–1950* (St. Lucia, Queensland: University of Queensland Press, 2003), 9–23.

36 George M. Fredrickson, *Racism: A Short History* (Princeton: Princeton University Press, 2002), 139–50; James R. Cochrane, "The Epistemic Violence of Racism: Hidden Transcripts of Whiteness," (South Africa: University of Cape Town Research Institute on Christianity, 2002), [http://www.chora-strangers.org/files/chora/cochrane\\_2002b.pdf](http://www.chora-strangers.org/files/chora/cochrane_2002b.pdf) (accessed April 14 2011); Pranee Liamputtong, *Researching the Vulnerable* (London: Sage, 2007), 3–9.

# Foundational and Instrumental Design Theory

## Per Galle

### Introduction: Two Questions about Design Theory

It seems fairly commonplace that the way designers conceive of the nature and purpose of design will affect their practice. To illustrate, consider three designers: For the first, design is a crusade against boredom and indifference; for the second, the goal is to minimize a cost-benefit ratio; and design for the third empowers socially disadvantaged people. Each of these designers would probably come up with rather different proposals even if working from the same brief. No doubt, the nature of such *direct* connections between individual designers' conceptions of design and their practice is complex and interesting. However, what I consider here is a different way in which basic conceptions may affect design practice: *indirectly*, via research.

Just as designers produce design proposals, design researchers produce design theory. And just as the *raison d'être* for design is that (some) proposals give rise to artifacts that people appreciate and use, the *raison d'être* for design research is that (some) design theory conveys facts and possibilities that facilitate, accelerate, or improve design practice, if taken into account by a designer. I call such theory *instrumental (design) theory*. Examples include theory about design processes (*method* if actions are prescribed); about function or aesthetics of particular artifact types; and about historical, cultural, and technical contexts of design.

Furthermore, just as designers have conceptions about the nature and purpose of design that affect the proposals they produce, so too, I submit, do design researchers have such conceptions that affect the instrumental theory they produce; thereby, they indirectly affect design practice—provided such instrumental theory is adopted by designers. This proviso is crucial. A designer who thinks of design as an artistic endeavor, for example, is not likely to adopt an instrumental theory for optimizing technical efficiency. For an instrumental theory to be adopted by a designer, the basic conceptions of the nature and purpose of design on which the theory was based must match those of the designer. If the basic conceptions underlying instrumental theory are left implicit or remain unclear, even designers who could benefit from adopting it may ignore the theory, or regard it with suspicion. Therefore, instrumental design theory should not stand alone, but should be supported by theory

expressing its underlying conceptions about the nature and purpose of design—what, accordingly, I call *foundational (design) theory*.<sup>1</sup>

So foundational and instrumental theory should be developed in a *coordinated* manner. This coordination does not mean, however, that every design researcher must produce both kinds of theory, nor indeed that even the most specialized instrumental theory must be supported by an equally specialized foundational theory of its own. On the contrary, workers in “basic research” might see it as their mission to produce whatever foundational theory is needed to support instrumental theory produced by colleagues in “applied research,” while the latter should consciously and critically use foundational theory already available. To prevent excessive fragmentation of design as an intellectual discipline, only a limited number of incompatible foundational theories should be tolerated, so as to reflect whatever genuine disagreement exists in the field.

In the remainder of this paper, I explore the idea of coordinated theory development, focusing on two questions:

- (1) What, more precisely, is the relationship between foundational and instrumental design theory?
- (2) Given the nature of that relationship, what is *good* foundational design theory? *Instrumental* theory is “good,” by definition, in the sense that it “conveys facts and possibilities that facilitate, accelerate, or improve design practice, if taken into account by a designer.” This explains the limitation of the second question to *foundational* theory.

To provide empirical background for the two questions, I first revisit three landmarks of the design research literature. Herbert Simon’s book, *The Sciences of the Artificial*,<sup>2</sup> and Donald Schön’s, *The Reflective Practitioner—How Professionals Think in Action*,<sup>3</sup> are widely recognized in the design research community as cornerstones of two major “schools of thought” (although both books deal with a wider range of phenomena than design). Arguably, each of these books has initiated or at least epitomized a design research *paradigm*, in Kuhn’s sense.<sup>4</sup> My third landmark is Klaus Krippendorff’s more recent book, *The Semantic Turn—A New Foundation for Design*.<sup>5</sup> Whether it will create a paradigm of its own remains to be seen, but it certainly aspires to do so. None of the three authors distinguishes foundational and instrumental theory in quite the way I propose to do. However, I show that they can be read and compared in the light of that distinction. Let us keep the two focus questions in mind, so as to consider some answers to them toward the end of the paper.

### Simon: Design is Problem Solving

Simon defines design very broadly: “Everyone designs who devises courses of action aiming at changing existing situations into preferred ones.” And “so construed,” he says, “design is the core of all professional training; [what] distinguishes the professions from the sciences.”<sup>6</sup> These professions include engineering, architecture,

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1 Foundational and instrumental theory are mutually exclusive concepts, and not exhaustive. Conceivably, there could exist design theory that is neither foundational nor instrumental (but useless, perhaps). Furthermore, what is foundational or instrumental theory to one person may not be so to another, or only to a lesser degree.

2 Herbert A. Simon, *The Sciences of the Artificial*, third ed. (Cambridge, MA: MIT Press, 1996 [1969]).

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

4 Thomas S Kuhn, *The Structure of Scientific Revolutions*, third ed. (Chicago: University of Chicago Press, 1996 [1962]).

5 Klaus Krippendorff, *The Semantic Turn. A New Foundation for Design* (Boca Raton: Taylor & Francis, 2006).

business, education, law, and medicine. However, Simon's idea of design soon narrows considerably because, according to him, solving a design problem amounts to finding a solution to a constraint satisfaction problem—and sometimes maximizing an “objective function” as well, thereby turning the problem into an optimization problem. A solution is given by a combination of values of a set of “command variables,” representing the sought-after artifact in its environment. Constraints on the values may represent natural laws, or goals to be attained.<sup>7</sup>

This brief outline roughly suggests what I see as Simon's foundational theory. At a more political level, he laments what he sees as an unfortunate tendency of universities and professional schools, after World War II, to replace the teaching of design with the teaching of “applied” natural sciences: physics and mathematics in engineering schools, biology in medical schools, finite mathematics in business schools. This development, he says, was driven by a hankering after academic respectability, combined with a lack of respect for traditional design theory, which was perceived as “intellectually soft, intuitive, informal, and cook-booky.”<sup>8</sup> However, despite the label of “applied,” such sciences do little to provide students with the design competence they need. So to resume their responsibility for relevant training, while achieving the desired academic respectability, Simon suggests that professional schools introduce and teach a new kind of design theory: “a science of design, a body of intellectually tough, analytic, partly formalizable, partly empirical, teachable doctrine about the design process”<sup>9</sup>—his version of what I call instrumental theory.

Simon develops no instrumental theory but recommends a number of topics for a design curriculum: utility theory, statistical decision theory, computational methods of optimization and constraint satisfaction, formal logics, and more. In the third edition of his book (cited here), he notes that some steps in this direction have been made, under the influence of the first edition, and contends that “[t]he need to make design theory explicit and precise in order to introduce computers into the process has been the key to establishing its academic acceptability.”<sup>10</sup>

This research paradigm of technical rationality underlies a huge amount of design research, particularly in the field known as “design computing.” I do not attempt a review here. Suffice it to note that, after spending many years working with design computing under the research paradigm represented by Simon, I eventually became disenchanted with it. One reason was its underlying assumption that a design problem can be specified with a high degree of completeness prior to the “search for solutions.” As my awareness of this assumption grew, I regarded it with mounting suspicion because it seemed at odds not only with my own experience, but also with persistently reported observations about the tendency of design problem and design solution to “co-evolve.”<sup>11</sup>

6 Simon, *The Sciences of the Artificial*, 111.

7 *Ibid.*, Chapter 5.

8 *Ibid.*, 112.

9 *Ibid.*, 113.

10 *Ibid.*, 114.

11 Bruce Archer, “Whatever became of Design Methodology?” *Design Studies* 1:1 (1979): 17–8. Nigel Cross, *Designerly Ways of Knowing* (London: Springer, 2006). Steve Harfield, “On Design ‘Problematization’: Theorising Differences in Designed Outcomes.” *Design Studies* 28:2 (2007): 159–73. Schön, *The Reflective Practitioner*. Kees Dorst and Nigel Cross, “Creativity in the Design Process: Co-evolution of Problem–solution.” *Design Studies* 22:5 (2001): 425–37. Chua has pointed out that in the second and third editions of *The Sciences of the Artificial* (1981 and 1996, respectively), Simon actually left room for co-evolution, before Schön explored it in his 1983 *The Reflective Practitioner* (Soo Meng Jude Chua, “Donald Schön, Herbert Simon and The Sciences of the Artificial.” *Design Studies* 30:1 (2009): 60–8). But Simon's endorsement of formal methods persisted throughout and dominated the general reception of his work (see Chua, 62).

Furthermore, the formalization of design solutions in terms of a given set of “command variables” (even if organized into sophisticated data structures, “objects,” or clauses of logic programming) seemed to me increasingly a straitjacket to the agile creativity called for in real-world situations. Thus, notwithstanding the benefits that formal methods offer in specialized contexts (e.g., layout and routing of integrated circuits), I’ve come to believe that, on the whole, Simon’s idea of a new general “science of design” (e.g., instrumental design theory) along these lines is a dead end.<sup>12</sup>

### Schön: Design is Conversation with the Materials of a Situation

Like Simon, Donald Schön leveled a severe criticism against professional training in the United States after World War II. However, what Schön saw as the problem was not undue reliance on applied science, but a more general “positivist epistemology of practice”<sup>13</sup> that led precisely to the kind of technical rationality advocated by Simon. His main objection to Simon’s proposed “science of design” is that it “can be applied only to well-formed problems extracted from situations of practice.”<sup>14</sup> According to Schön, this is seldom possible because, as he puts it, “[i]n the varied topography of professional practice [...] there is a swampy lowland where situations are confusing ‘messes’ incapable of technical solution.” He admits that there is also “a high, hard ground” where problems *are* amenable to technical methods. However, such problems “are often relatively unimportant [...], while in the swamp are the problems of greatest human concern.”<sup>15</sup> Schön describes this challenge to developers of instrumental design theory as *the dilemma of rigor or relevance*. Either you can apply sophisticated technical methods to relatively unimportant problems; or you can face the “messy but crucially important” problems that leave you to your own devices of “experience, trial and error, intuition and muddling through.”<sup>16</sup> The “messiness” involves such phenomena as “complexity, uncertainty, instability, uniqueness, and value-conflict,” which do not fit methods of technical rationality.<sup>17</sup>

For Schön, good design is a prime example of *reflective practice*:<sup>18</sup> the flexible process of trial and error that a practitioner engages in to deal with the “messy” problems of life. To cite Schön’s characteristic phrase that summarizes his foundational theory, design is “a conversation with the materials of a situation.”<sup>19</sup> The designer “shapes the situation, in accordance with his initial appreciation of it, the situation ‘talks back,’ and he responds to the situation’s back-talk.”<sup>20</sup> This conversation should be “reflective” in that the designer is critically aware of his or her current understanding of problem and actions, and is ready to revise that understanding. Schön develops this account in detail, notably by means of an elaborate case study of architectural design.<sup>21</sup> Rather than an abstract and self-sufficient “science of design,” above and beyond practice, Schön seeks “an epistemology of practice implicit in the artistic,

12 For a less idiosyncratic critique of Simon’s idea of design as problem solving, see Kees Dorst, “Design Problems and Design Paradoxes.” *Design Issues* 22:3 (2006): 4–17. Dorst finds the notion of a “design problem” useless as a unit of description because of the co-evolution of problem and solution. Instead, he proposes what amounts to a foundational theory in terms of “paradoxes.” He does not, however, indicate implications of this lens for instrumental design theory.

13 Schön, *The Reflective Practitioner*, 48.

14 *Ibid.*, 47.

15 *Ibid.*, 42.

16 *Ibid.*, 43.

17 *Ibid.*, 39. Schön’s distinction between “high, hard ground” and “swampy lowland” corresponds rather closely to Rittel’s famous distinction between “tame” and “wicked” problems (Horst Rittel, “On the planning crisis: systems analysis of the ‘first and second generations.’” *Bedriftsøkonomien* 8 (1972): 390–6).

18 Schön, *The Reflective Practitioner*, 345.

19 *Ibid.*, 78.

20 *Ibid.*, 79.

21 *Ibid.*, Chapter 3.

intuitive processes which some practitioners do bring to situations of uncertainty, instability, uniqueness, and value conflict.”<sup>22</sup>

When it comes to a possible instrumental design theory, Schön’s view is more balanced than Simon’s. He acknowledges the value of applied science to “some parts of some practices,”<sup>23</sup> yet he strongly opposes the conventional (positivist) separation of *research* from *practice* (as well as *means* from *ends*, and *knowing* from *doing*).<sup>24</sup> He proposes a radical change in our conception of research versus practice, which makes it difficult to distinguish instrumental theory from practice itself. For, according to Schön, a good practitioner, whenever faced with the messiness and uncertainty of a unique professional situation, is triggered into “reflection-in-action,” which involves undertaking “on-the-spot experiments” that conform to certain standards of “rigor” of their own<sup>25</sup>—standards that significantly depart from those of conventional experiments under laboratory conditions. Schön accepts these alternative standards without qualms, which leads him to the remarkable conclusion that “*research is an activity of practitioners.*”<sup>26</sup> The controversial nature of that view is exacerbated by Schön’s discussion of the practitioner’s on-the-spot experiments in such terms as “the sort of science that does not appear in the scientific journals.”<sup>27</sup> I suspect this idea may have contributed to the widespread confusion about “practice-based research” in design, and may have fueled the heated debate that still goes on about whether design practice, in itself, should count as research in academic contexts.<sup>28</sup>

This being as it may, Schön nevertheless adds that “there are kinds of research which can be undertaken outside the immediate context of practice in order to enhance the practitioner’s capacity for reflection-in-action”—*reflective research*, he calls it.<sup>29</sup> And just as Simon saw elements of a “science of design” emerge, so Schön holds that there are four kinds of reflective research, “each of which already exists at least in embryo.” Here, I discuss the four kinds of research in the context of design and evaluate them only for our current purposes—namely, as proposals for instrumental design theory.

(1) “Frame analysis”<sup>30</sup> is a study of how practitioners frame (e.g., understand and state) the problems they deal with, and the roles they assume. For example, at a general level, an architect may see himself as a historicist, a modernist, or an advocate of good craftsmanship. At a particular level, one frame (e.g., guiding idea) for addressing a site-planning problem might be the effect that slopes of the site have on the geometry of clusters of buildings placed along them.<sup>31</sup> Each such frame directs the designer’s focus of attention and shapes his or her actions in a certain way. Often the frames are not consciously acknowledged, so bringing them to light can help practitioners actively *construct* their professional reality, rather than taking some version of it for granted.

It seems both desirable and feasible that *frame awareness* be kindled in design students during their training. One way to do

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22 Ibid., 49.

23 Ibid., 308 (an admission he repeats in similar form on p. 325).

24 Ibid., 165.

25 Ibid., 141–56.

26 Ibid., 308 (emphasis added).

27 Ibid., 145.

28 For a summary of the controversy, see, e.g., Michael A. R. Biggs and Daniela Büchler, “Rigor and practice-based research.” *Design Issues* 23:3 (Summer 2007): 62–9.

29 Schön, *The Reflective Practitioner*, 309–25.

30 Ibid., 309ff.

31 Ibid., 85ff, 93–4.

so would be by asking them to reflect on and make explicit their own framing of a particular project, and to explain how these basic assumptions and guiding ideas affect design products. This exercise, in effect, amounts to asking the students to produce instrumental theory of their own. Another way would be to expose students to research by others on the history of existing artifacts, where the research aim is to reveal how the artifacts were shaped by their designer's (implicit) framing. (This paper may be seen, incidentally, as an attempt to analyze basic frames of design *research*—its foundational theories—rather than design *practice*.)

(2) According to Schön, “repertoire-building research”<sup>32</sup> would help practitioners become familiar with a stock of precedents or exemplars to which situations encountered in practice may be seen as analogues and that may provide guidance in dealing with those situations. For example, an architect's repertoire might comprise historical buildings and Italian hill town architecture, as well as patterns of reasoning used in certain situations.

Case studies as part of a design curriculum might draw on research on design history, which would thus provide instrumental theory by contributing to the students' “repertoires” (in addition to enhancing their frame awareness, as already discussed).

(3) “Research on fundamental methods of inquiry and overarching theories”<sup>33</sup> is the examination of episodes of practice so as to discover how competent practitioners overcome difficult situations by restructuring (*reframing*) them in the light of theories from apparently unrelated domains. As an example, Schön describes how a product development team was trying to devise a new kind of synthetic bristle for paintbrushes, but did not make headway until one member saw the paintbrush as a kind of *pump*, and brought pumping-theory to bear on the case.<sup>34</sup>

Schön's discussion is rather sketchy at this point and unrelated to design; but if I interpret him correctly, the third kind of “reflective research” is subsumed under the more general fourth kind.

(4) “Research on the process of reflection-in-action”<sup>35</sup> is a systematic recording (by means of “protocols”), observation, and analysis of actual practice, possibly involving some degree of intervention by the researcher.

The case studies reported in his book exemplify this approach—notably the architectural site planning case<sup>36</sup> in which Quist, a teacher of architecture, reviews work by Petra, one of his students. Their conversation and sketching during the review session was meticulously analyzed and interpreted in terms of Schön's conceptual apparatus of “reflective practice.”<sup>37</sup> This case study became a model for many subsequent protocol studies of designers' work.<sup>38</sup> A good example is the study of student design teams by Valkenburg and Dorst, where Schön's terminology is explicitly used and clarified.<sup>39</sup> No doubt exposure to results of such studies can prepare prospective designers for the “messiness” of the

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32 Ibid., 315ff.

33 Ibid., 317ff.

34 Ibid., 184.

35 Ibid., 320ff.

36 Ibid., Chapter 3.

37 According to Goldschmidt, credit is due to Roger Simmonds, at the time a Ph.D. student under Schön's supervision, for his “help in providing the material and interpreting it.” (See Gabriela Goldschmidt's review of “The Cognitive Artifacts of Designing” by Willemien Visser, *Design Studies* 29:1 (2008): 93–6.)

38 Curiously enough, protocol analysis as a means of studying human cognition was pioneered by Simon, in collaboration with Newell (Krippendorff, *The Semantic Turn*, 226).

39 Rianne Valkenburg and Kees Dorst, “The reflective practice of design teams.” *Design Studies* 19:3 (1998): 249–71.



“swampy lowlands” of design practice in a way that supplements and reinforces their own evolving experience. In this sense, Schön’s fourth kind of reflective research has something valuable to offer by way of generating instrumental design theory.

### **Krippendorff: Design is Making Sense of Things**

The level of ambition of Krippendorff’s book is daunting. His opening sentence reads: “This book introduces a new way of conceptualizing design as a professional practice and as an activity that is constitutive of human beings generally.”<sup>40</sup> As clearly as one could wish, this statement sets the goal of developing a foundational theory. The essence of Krippendorff’s theory is partly suggested by his dictum: “Design is making sense of things.”<sup>41</sup> He urges that the design profession undergo a *semantic turn* away from merely “shaping the appearance of mechanical products” to “conceptualizing artifacts, material or social, that have a chance of meaning something to their users.”<sup>42</sup> The semantic turn is a turn away from “technology-centered design” toward “human-centered design.”<sup>43</sup> Schön’s foundational theory was human-centered, too, by virtue of its focus on the designer. Krippendorff’s theory more broadly emphasizes the importance of “stakeholders” in design, including the users of design products.

His semantic turn is supposed to do for design what *the linguistic turn* did for philosophy in the twentieth century. The linguistic turn in philosophy involved a re-orientation toward *language* as a source of insight into philosophical problems.<sup>44</sup> Given this view, the importance of *discourses* (roughly, socially institutionalized ways of thinking, talking, and acting) becomes evident, and Krippendorff’s explicit aim on behalf of the design profession is to make it “redesign” itself by “starting to talk differently about design, the world it can affect, what to do, and how to proceed”<sup>45</sup>—in short, by consciously changing its professional discourse so as to bring about *the semantic turn*. In this respect, Krippendorff’s endeavor is similar in nature to what Schön called “frame analysis,” but in Krippendorff the exercise is not to be undertaken at the scale of a single design problem, design project, or designer, but at the scale of the entire profession.

The semantic turn itself rests on the “axiomatic” assumption of human-centered design: that “meaning matters more than function” (inherited from product semantics).<sup>46</sup> Construing the import of Krippendorff’s semantic turn as a foundational design theory, it seems fair to say that, in accordance with its axiom, it amounts to regarding *design* as a matter of *proposing realizable artifacts in such a way as to anticipate and justify what they will mean to others*<sup>47</sup>—that is, what their “technological, social, and cultural consequences” will be to the stakeholders.<sup>48</sup> According to Krippendorff, designers should lay claim to expertise in a “second-order understanding” of artifacts: an understanding of how others understand artifacts.<sup>49</sup> Such “extraor-

40 Krippendorff, *The Semantic Turn. A New Foundation for Design* (2006), viii.

41 Ibid., xv.

42 Ibid., xvii.

43 Ibid., 39.

44 Ibid., section 1.3.7.

45 Ibid., 37.

46 Product semantics can be traced back to work by Klaus Krippendorff and Reinhard Butter in 1984 (*The Semantic Turn* viii, n 3; 1 ff 47).

47 The closest Krippendorff comes to a concise, explicit *definition* of design is “design proposes realizable artifacts to others” 25, but he offers this description only as a corrective comment to Simon’s definition (about “changing existing situations into preferred ones”).

48 Krippendorff, *The Semantic Turn*, 209.

49 Ibid., Section 2.5.

dinary sensitivity to what artifacts mean to others, users, bystanders, critics [...] has always been an important but rarely explicitly acknowledged competence” of designers, he says; it is an expertise they should now bring into focus and promote as something that no other profession offers, and they should appreciate it as “a solid rhetorical ground from which to justify their work.”<sup>50</sup>

Krippendorff unfolds this *foundational* theory at length in terms of the meaning of artifacts in relation to their use, to language, to their life cycle, and to “an ecology of artifacts.” Eventually, he proposes a “new science for design”<sup>51</sup>—an *instrumental* theory—in a manner similar to what Simon and Schön had done. He offers a list of five features of his “science for design.”<sup>52</sup> The list may seem rather speculative at first, but subsequently Krippendorff associates a number of *methods* with each feature. In brief summary, the features and methods are as follows:

(1) Design is concerned with what does not yet exist, with innovation and “making things happen.” Thus, the science for design should not mimic methods and traditions of natural sciences, which are “searching for generalizable patterns that existed in the past.” Associated methods include brainstorming, creativity-enhancing techniques, and systematic combinatorial techniques.<sup>53</sup> (Some of the latter are related to methods proposed by Simon.)

(2) Designers need to know which “futures” (proposed changes) constitute improvements and which do not, and for whom. Thus, designers must acknowledge and take into account the visions of people affected by a proposal, and the science for design must support the requisite second-order understanding. Associated methods include the use of fiction, interview techniques and focus groups, observation of user behavior, analysis of think-aloud protocols recording user interaction with artifacts, ethnography, and participatory design.<sup>54</sup>

(3) Second-order understanding (e.g., obtained by the methods just identified) should inform design decisions. Describing this feature, Krippendorff contrasts *design* with *engineering*: “Engineering has it easy,” he says, because it “is concerned [only] with the functional aspect of technology” and therefore does not require any second-order understanding, whereas design methods must be concerned with the users’ understanding, and with social aspects of artifacts. The methods associated with this feature are *design methods* proper; they focus on how stakeholders attribute meanings to artifacts, and “at least in principle,” they render design proposals that are *empirically testable* (or rather, that can be *evaluated*, because “a projected future cannot yet be observed” [see item 1]). Krippendorff sketches “five proven methods” of this kind.<sup>55</sup> One of them, for example, is about “designing artifacts that are informative (expressive) of their workings.”

(4) Designers need a rhetorical understanding on which to base the validity of their claims about design proposals. Rather than

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50 Ibid., 48.

51 Ibid., Chapter 7.

52 Ibid., 210–13.

53 Ibid., Section 7.2.

54 Ibid., Section 7.3.

55 Ibid., Section 7.4.

making feeble appeals to aesthetic sensitivities and unsupported predictions of cultural trends, or borrowing validity criteria from other disciplines, designers should be able to rely on the science for design to provide ways for them to “substantiate the claims made for their designs.” Such “semantic claims” must convince “skeptical stakeholders about the virtue of a design”<sup>56</sup> and, as noted under item 1, they always concern the future. In contrast to claims of engineering, a designer’s semantic claims are not justifiable by mathematical theories, and Krippendorff lists five ways (if not exactly methods) of convincing the skeptical stakeholders.<sup>57</sup> For example, “methodological validity” consists of a critical examination of the design process that led the designer to a proposal, in analogy to a natural scientist’s critical examination of the circumstances under which an experimental result was obtained.

(5) Apart from critically investigating design *from within* and supplying designers with “reliable concepts, methods, and knowledge,” the science for design “has to sustain the viability of its own discourse”—but not through a philosophy of science, for a “philosopher of science who would target the science for design is condemned to remain outside it and therefore [to remain] only of marginal importance to designers.”<sup>58</sup> The science for design should be both “*a science of making and a philosophy of realizing artifacts with and for others.*” Apparently, the notion of the “viability of discourse” is to the entire practice of the design profession what “validity of claims” is to the particular design project (see item 4). The methods proposed to ensure viability<sup>59</sup> include systematic collection of experience from successes and failures of projects, scholarly documentation of design discourse, institutionalization of design research, and self-reflection in collaboration with relevant stakeholders to ensure that design research develops its own research paradigm.

As should be clear by now, there are significant parallels among Simon, Schön, and Krippendorff. While Simon and Schön open their discussion by thoroughly criticizing the status and role of professions in society, Krippendorff’s critique of the design profession is equally acute, only more implicit. It surfaces in the form of occasional warnings about making unsupported claims, uncritically adopting research paradigms from other fields, mimicking natural science, or surrendering one’s territory of expertise to other disciplines. Krippendorff’s ideas on the validity of semantic claims (see item 4) are crucial to the project of ensuring academic respectability through instrumental theory (“science for design”). It seems to be analogous to, but far more level-headed than, Simon’s “hard” program of achieving academic respectability by forcing design theory to fit computerization, or indeed Schön’s “soft” endorsement of practitioners’ “on-the-spot experiments” as a yardstick of theoretical rigor.

But there are significant differences as well. Where Simon focused on the prospective artifact as a system, and on technical

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56 Ibid., 261.

57 Ibid., Section 7.5.

58 Ibid., 271.

59 Ibid., Section 7.6.

methods for determining it, Schön introduced the designer as a human element, and Krippendorff expands the scope of his foundational theory—partly by extending the range of designed artifacts under consideration and partly by including other relevant stakeholders in addition to the designer.<sup>60</sup> This extreme degree of human-centeredness and the central position accorded to the notions of meaning and second-order understanding are probably what lead Krippendorff, in one important respect, to *narrow* the scope of his instrumental design theory: As noted, he draws a sharp distinction between design and engineering, excluding the latter form consideration. Indeed, Krippendorff seems to endorse the somewhat simplistic view succinctly rendered by Owen: “In simplistic terms, it is sometimes said, ‘designers work with thing-to-people relationships, engineers work with thing-to-thing relationships.’”<sup>61</sup> In contrast, Horváth’s survey and classification of topics in engineering design research readily accommodate them both:<sup>62</sup> thing-to-people relationships and thing-to-thing relationships.

#### **Discussion: What is the Foundational–Instrumental Relationship?**

As we have seen, Simon, Schön, and Krippendorff have contributed to design as an intellectual and academic discipline by assuming a foundational design theory and suggesting instrumental design theory, albeit without making that distinction. However, their instrumental theories would point in very different directions if consulted by a designer for practical guidance.

Is it because their foundational theories are logically incompatible and therefore entail incompatible instrumental theories? The answer is negative, in that a foundational theory is not literally an axiom system, and an instrumental theory is not a system of theorems that follow by deduction. Simon, for instance, might have maintained his position that design is essentially a matter of problem solving in planning the improvement of existing situations, without being forced to conclude that such problems be solved mathematically or computationally.

Nor are the basic tenets of Simon’s, Schön’s, and Krippendorff’s foundational theories logically incompatible. Design as problem solving could, conceivably, be conducted as a Schönian “conversation with the materials of a situation” (although frequently redefining “command variables” would be cumbersome), while also being conceived of as a search among numerous prospective artifacts that are anticipated to make sense to their stakeholders, along the lines of Krippendorff’s “semantic turn.”

Judging from these observations of the foundational theories in Simon, Schön, and Krippendorff, it would seem that, by way of answer to our first focus question (see the introduction), the relationship between foundational theories and the instrumental theories that emerge from them is not well-defined at all; it is rather too subtle—or merely too fluid—to be described in precise terms of

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60 Something I haven’t discussed, but see his Section 1.2.

61 Charles L. Owen. “What is Design?” (Institute of Design, Illinois Institute of Technology, 2004). <http://www.id.iit.edu/141/getdocument.php?id=64> (accessed September 11, 2008).

62 Imre Horváth, “A treatise on order in engineering design research.” *Research in Engineering Design* 15 (2004): 155–81.

logic. Perhaps the adequacy of the three sample foundational theories for supporting powerful instrumental theory is best described metaphorically—in terms of the potential a flashlight might have for lighting up a dark room. The clarity and concentration of the beam of light it emits determine what we see, but only up to a point, for very much of what we see depends on where we point it.

Thus, even though in hindsight we may consider Simon's instrumental theory a dead end, and therefore tend to reject his foundational theory of design as problem solving, we should ask ourselves if this rejection is justified. Is it possible, after all, that nothing was wrong with the idea of design as problem solving, but only with the particular way Simon used it as a flashlight in the darkness—and with the way many of us pointed it in the wrong direction as well?

In comparison, Schön's flashlight may seem a bit dim (powered as it is by a low-wattage idea of design proceeding by trial and error); yet he managed to light up what Simon missed: the human power of creativity. However, this fresh insight does not exhaust the potential of Schön's flashlight; as noted, "frame analysis" was one of the more promising possibilities he suggested.

The beam of light from Krippendorff's flashlight is bright and firmly directed toward the stakeholders of design. It appears to reveal bits and pieces of an answer to the practitioner's request for guidance. However, its light is oddly monochromatic and, no matter where we might point it, it lights up only the *meanings* involved in thing-to-people relationships. The thing-to-thing relationships it leaves in the dark—with the engineers.

### Discussion: What is "GOOD" Foundational Theory?

What the readings would suggest is that instrumental theories might well be affected by one's foundational theories, but in rather obscure ways. Furthermore, foundational theory tends to be stipulated without justification regarding its usefulness in supporting instrumental theory. Thus, when it comes to answering our second focus question, about what a *good* foundational theory is, we are at a loss for guiding principles.

Once more, let us turn to a lighting metaphor for help. When deciding how to light a room, generally the recommendation is to distinguish among and combine three kinds of lighting: (1) *general lighting* to provide overall illumination that allows you to walk about the room safely; (2) *task lighting* for more concentrated illumination where you perform certain kinds of recurring activities (e.g., cooking, reading, sewing, etc.); and (3) the occasional *accent lighting*, to provide visual interest or drama to the room by locally highlighting particular features (e.g., the texture of a wall, drapery, or prized possessions, such as a painting or a house plant).<sup>63</sup>

If the problem with current major foundational design theories is that they work somewhat erratically, like flashlights

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63 American Lighting Association, "Lighting your life" (2009). [http://www.americanlightingassoc.com/info\\_lighting3.php](http://www.americanlightingassoc.com/info_lighting3.php) (accessed February 10, 2009).

lighting up only what they happen to be pointed at, then perhaps we should begin to look for foundational theories that work more like, say, a ceiling lamp that provides *general lighting* to the room of design. The light source of such a theoretical fixture would be a good *definition* of design—one that is not unduly colored by values and that illuminates the subject matter that our instrumental theories should address to serve design as a professional and intellectual discipline. However, it should illuminate nothing beyond that subject matter.

The instrumental theories, on the other hand, should work by analogy to task or accent lighting: like *task lighting* if they are intended to support a particular type of design task (e.g., graphic design or design of databases, furniture, diesel engines, sculptural ceramics, or organizations), and like *accent lighting* if they are intended to draw useful lessons from the study of individual cases (e.g., prized possessions, such as the Life & Work of Jørn Utzon, or the success of Philippe Starck's "Juicy Saliff" lemon squeezer). This elaborate metaphor of task and accent lighting is a conjecture that I pursue no further here. As an afterthought to our discussion in the previous section of our first focus question, the metaphor explains how instrumental theories might fit into and supplement a foundational theory, whose purpose (more to the point of the present section), is to endow the entire body of theory with some measure of unity and to determine what should count as design research and what should not.

In terms of the lighting metaphor, our concern here is the notion of a foundational theory that works like a fixture for general lighting, with a *definition* of design as its source of light. Of the three theorists whose work we have reviewed, only Simon offers an explicit definition: design as devising courses of action for "changing existing situations into preferred ones." Persuasively elegant though it is, it covers many situations that are obviously irrelevant to design research or design as a profession. For example, it includes as "design" the neighbor's cat planning when and from where to jump at the mouse she has spotted in my garden, or me contemplating an impulse to kick off my shoes under the conference table because my feet are getting hot. As we saw, Simon overcompensated for this hyper-generality by, metaphorically speaking, encapsulating his definition in a dark lampshade with a single narrow opening toward formally specified constraint satisfaction and optimization problems.

Any definition of design focuses attention on a particular range of phenomena, and the less "shading" we need to add subsequently to modify that range, the better. Still, there is no fact of the matter that dictates a single "correct" definition. As Buchanan once put it, "battles over the correct definition of design are fruitless." But we should recognize "that definitions serve the purpose of shaping a particular line of inquiry and that the field

will be vital as long as definitions come and go [...].”<sup>64</sup> However, as I have argued elsewhere,<sup>65</sup> too much coming and going of definitions may disintegrate the body of design theory and compromise the credibility of design research. In addition, developing one’s definition(s) of design in a more principled way than picking whatever might provoke a lively debate is surely possible. I would suggest that definitions of design be developed according to the following criteria:

(1) *Public acceptability*. The definition should resonate intuitively with the use of the word “design” in common parlance, as well as in relevant professional, educational, and research organizations. (Otherwise, communication is hampered by confusion.)

(2) *Suitable coverage*. The definition should cover a range of phenomena that is neither too narrow nor too broad (or heterogeneous) for the concept of design to be useful as a tool for thinking. (If too little is covered, the concept is seldom relevant; if too much is covered, attributing the concept to a particular phenomenon conveys very little meaning.)

(3) *Explorative potential*: The definition should explicate design in terms of other concepts that suggest fruitful avenues of research and understanding. (This potential may be dispensable but is obviously desirable.)

Even so, Buchanan is right that there is no single “correct” definition. However, in the interests of unity and credibility, we should use these (or similar) criteria in making an effort to *converge*—if not on a single definition, then on at most a small handful of alternative definitions, representing whatever genuine disagreement may exist among competing schools of thought. To illustrate my point, let me suggest a definition and briefly evaluate it according to the criteria.

*Design*: Creatively proposing an idea,<sup>66</sup> so as to enable yourself or others to make an artifact according to the idea.<sup>67</sup> Following Hilpinen, I take an *artifact* to be “an object [not necessarily material] that has been intentionally made or produced for a certain purpose.”<sup>68</sup>

To argue for the *public acceptability* of this definition, I would point out that it does not imply actual making of an artifact. This circumscription is quite in accordance with common parlance, where “design” is used not only in cases where an artifact is eventually made, but also in cases where a designer merely *proposes* an artifact, as is often the case for students of architecture. Furthermore, I believe the definition corresponds well to what people of various professions do who call themselves “designers,” and to what students learn to do when taught to “design,” whether for engineering or for more artistically based disciplines. No doubt there are good reasons to differentiate the various design professions, but there are good reasons, too, for clearly conceptualizing and addressing what they have in common: in Margolin’s words, “to define new points of

64 Richard Buchanan, “Design as Inquiry: The Common, Future and Current Ground of Design.” (paper presented at DRS Futureground International Conference, Melbourne, 2004).

65 Per Galle, “Candidate Worldviews for Design Theory.” *Design Studies* 29:3 (2008): 267–303.

66 I am grateful to Helle Egsgaard for her constructive criticism of an earlier version of the definition, which led to a greater emphasis on the initial cognitive process.

67 Adapted from Galle, “Candidate Worldviews for Design Theory,” 272.

68 Risto Hilpinen, “Artifacts.” *Stanford Encyclopedia of Philosophy* (Fall 2004). <http://plato.stanford.edu/archives/fall2004/entries/artifact/> (accessed August 24, 2011).

69 Victor Margolin, “The need for design studies.” in *Design at the Crossroads: A Conference Report*, M. Diani and V. Margolin, eds. (Evanston, IL: Design/Technology/Society Work Group, Center for Interdisciplinary Research in the Arts, 1991).

70 Per Galle, *The CEPHAD Bibliography* (initiated 2007). <http://www.dkds.dk/Forskning/Projekter/CEPHAD/literature/bibliography> (accessed September 29, 2010).

- 71 Per Galle, "Design as Intentional Action: A Conceptual Analysis." *Design Studies* 20:1 (1999): 57–81.
- 72 Gerald Vision, "Reference and the Ghost of Parmenides." in *Non-Existence and Predication* (Grazer philosophische Studien, Band 25/26. Amsterdam: Rodopi, 1986) 297–326.
- 73 In a recent paper (Ann Heylighen, Humberto Cavallin, and Matteo Bianchin, "Design in Mind." *Design Issues* 25:1 (2009): 94–105), design (as contrasted to research) is analyzed in terms of Searle's notion of intentionality (directedness) of mental states: *Beliefs* are true or false depending on how they fit, or change to fit, the world (their "direction of fit" being "mind-to-world"). *Desires* are fulfilled or unfulfilled depending on how the world fits, or changes to fit, *them* (their "direction of fit" being "world-to-mind"). What I call an "idea" in my definition might be construed as a "desire" in this sense, and the "production of an artifact" as a way to fulfill it by changing the world. In the terminology of Heylighen et al., what I call "prediction" would have to be construed as forming a "belief" during the "evaluation" stage. However, at that stage, there is nothing to determine the truth or falsity of that belief, for "what is evaluated [e.g., the artifact being designed] does not yet exist" op. cit. 99. Yet for the evaluation to be of any use to the designer, the resulting belief must have some measure of *reliability*. Heylighen et al. seem to contend that *imagination* can somehow make up for the missing target for the beliefs a designer forms when evaluating a proposal 99. They do not explain how, nor do they address the issue of reliability (for which they are not to be blamed because their aim was to compare design with research, not to explain how design is possible in the first place). I have had some stabs at the reliability problem in "Candidate Worldviews for Design Theory," *Design Studies* (2008), and more recently in Per Galle, "The Ontology of Gero's FBS Model of Designing." *Design Studies* 30:4 (2009): 321–39.

contiguity and to facilitate greater collaboration between different types of designers while making it possible for individual designers to address a greater range of problems than most now do."<sup>69</sup> The definition offered is an attempt at just that, and by the same token, it would appear to have *suitable coverage*: It does not restrict attention to a narrow professional specialty or product type, or to a particular methodological approach; nor does it, on the other hand, include blatantly irrelevant phenomena, such as mouse hunting or shoe kicking.

The *explorative potential* of the definition is more difficult to assess in advance. No doubt it is possible to *define* design in some other way, without referring, as I did, to *creativity*, to *ideas* of prospective artifacts, and to the *purposes* (be they utilitarian or artistic) that these artifacts should serve if eventually produced. But I cannot imagine that it is possible to *practice* or *teach* design without familiarity with these concepts. And familiarity deepens with exploration.

We should not forget, however, that just as it takes more than a light bulb to make a lamp, it takes more than a definition to make a foundational theory. Part of this additional material is already available in the literature on (the nature of) creativity, artifacts, etc.,<sup>70</sup> and more is likely to emerge from using the explorative potential of the definition (or that of other definitions). In particular, it seems to me that, to obtain a sufficiently deep understanding for coming up with a full-fledged foundational design theory, we need to address the vexed questions that arise from the simple fact (highlighted by the definition, but inescapable no matter how we define design) that at the time a given artifact was designed, it did not exist.<sup>71</sup>

For example, according to a widely accepted understanding of properties, they are always properties of some existing entity.<sup>72</sup> From this perspective, as long as the artifact did not exist, it could not have had any properties. Thus, at the time of its design, the artifact could not have had the particular property of *serving its purpose*. How then, could the designer know (or be confident) at that time that the artifact would eventually serve its purpose? *Prediction* rather than *predication* of properties appears to be involved, but what exactly does that mean, and what, if anything, makes it reliable?<sup>73</sup> How, indeed, is design possible—thrusting forward, as it does, into an empty space of non-existence?

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# Beyond Blueprints and Basics: A Service Design Conference Report

Kipum Lee

On October 29, 2010, the Service Design Network<sup>1</sup> held a one-day intensive Service Design Conference in Cambridge, MA. The conference was hosted by Microsoft at the New England Research and Development Center and organized by Shelley Evenson, Jamin Hegeman, Mark Jones, and Birgit Mager. One goal of the conference was to formally extend into the United States the conversation around service design that has been developing in Europe.<sup>2</sup> Another goal of the conference was to develop a community around service design by providing an opportunity for those practicing and interested in the subject to come together.

The roughly 110 participants included practicing professionals from a variety of fields—healthcare, hospitality, government, public services, software development, and design consultancies—as well as academics from design and management schools. The participants also came from all over the United States, Canada, Germany, and South Korea. Some identified themselves as service designers in their line of work or inquiry; others have only recently become interested in service design. The participants embraced this diversity and sought new ways to find connections and common ground during the gathering.

Although the conference did not have a specific title or theme, the nature of its content and speakers provides some insight into the issues that are of current importance, as well as the emergent issues in service design. The six presentation topics were “Service Design: An Organizational Challenge” by Oliver King, “The Behavior Chain: Linking the Tools and Methods of Service Design to Meaningful and Measurable Behavior Change” by Robert Fabricant, “Service Meets Social” by Shelley Evenson, “The Digital Service Experience” by Monica Bueno, “Architecting for Mass Collaboration: How Civic Hackers are Building Better City Services with Government” by Peter Corbett, and “Finding the Soul of Service Design” by Mark Jones. King emphasized the capability of service designers through the illustration of a successful project, Bueno provided heuristics for successful service design outcomes in the form of lessons, Corbett shared the experiences of civic hackers and the design of social technologies, and the other three presentations contained substance about the application of service design to social issues. In addition, a panel led by Lew McCreary had Chris McCarthy and Lorna Ross engage in a focused dialogue around services in healthcare innovation.

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1 For more information, please see <http://service-design-network.org/> (accessed January 10, 2011).

2 This was the fourth Service Design Conference organized by the Service Design Network and the first conference organized by this group in the United States. Historically, two other service design conferences were held in the United States in 2006 and 2007, organized by the Carnegie Mellon University School of Design. Thus, the Service Design Network’s conference in Cambridge, MA, is the third service design conference in the United States.

One way to reflect on this content and discover a productive way to understand the relevant issues in service design is to consider the three major themes that were woven throughout the conference: *service design and types of service products*, *service design and processes of innovation*, and *service design and wicked problems*. These themes reflect some of the concerns and areas of controversy in the domain of service design today. More interestingly, they are likely to be areas of exploration in years to come.

### The Expansion of Service Products

One major strand of inquiry concerned the new products made in the name of service design. During the conference in Cambridge, it was evident that the range of service products continues to grow. Such growth is one way to follow the progress of the discipline.

Perhaps of all the presentations, Peter Corbett's narrative of "Apps for Democracy"—a mash-up competition for developers—best illustrates one of the growing frontiers of service products. Corbett's work involves facilitating networks of ordinary citizens who take available open-source data and produce useful and meaningful products for public use. One service produced by "Apps for Democracy" is a mobile application that indicates levels of safety in different areas of Washington D.C. This app informs individuals and families making decisions about where to live in the nation's capital by providing statistics of crime incidents as well as a qualitative "threat meter." This work, which amplifies the role of the public as opposed to the traditional designer, illustrates a new type of subject matter that has become part of the service design discourse.<sup>3</sup>

Of course, public participation is not new in service design. The second Emergence conference, at Carnegie Mellon in 2007, began with a presentation about a public visualization platform by Fernanda Viégas and Martin Wattenberg, called "Many Eyes," that enables anyone on the Internet to take a data source, such as words from a political speech, visualize it, and share it with others.<sup>4</sup> However, since 2007, more sophisticated technologies, especially mobile platforms, have expanded the opportunities for collective creation. In the context of these advancements, Corbett discussed service applications for local businesses, the public sector, and governments.

Such service applications and their development generate new controversies in this burgeoning field. Products from initiatives such as "Apps for Democracy" call for mass collaboration and the creation of communities; however, participation requires a working knowledge of how to manipulate the provided data. Thus, participation is still limited primarily to developers who are experts in some way. As the discipline of service design matures, answers to questions like "Who designs for services?" and "Who is being left out

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3 For examples of open-source data, see the Obama Administration's Open Government Initiative, which has made government data available to the public through websites like <http://data.gov>, <http://recovery.gove>, <http://USAspending.gov>, and <http://it.usaspending.gov> (accessed January 10, 2011).

4 See <http://www-958.ibm.com/software/data/cognos/manyeyes/> (accessed January 10, 2011).

of the design process?" will dramatically affect the types of services being produced.

### Service Design and Processes of Innovation

Another significant theme of the event was the idea that service design can provide a way to change an organization by contributing to a process of innovation. As more organizations see the value of service design work, a quiet optimism grows among designers that demonstrating the ability to design for services through new ways of thinking, doing, and making can alter the way organizations are managed. This possibility for change was articulated several times during the conference, and a good portion of the questions and feedback from the audience were in response to this issue.

For instance, Oliver King, from the service design firm Engine, shared some concrete examples of value-added services for the travel industry. In conjunction with these services, Engine's project members challenged the client to create a service management team that would develop and sustain the proposed services. King also shared a model showing different levels of engagement at which service design projects can serve as catalysts for organizational change.<sup>5</sup> At the lower levels, small projects provide insights and commonly understood service design deliverables to clients.<sup>6</sup> The middle level reflects a greater appetite for service design work and integrates design capability into an organization. The highest level activates service design at the system level, resulting in the remodeling of an entire organization. This theme of service design as a way to bring transformation to an organization challenges the notion that it is just a tactical tool to be exploited for competitive advantage. By engaging with organizations also at the middle and highest levels, service design as a discipline has opportunities to evolve and mature.

Although momentum appears to be moving service design in a direction that offers organizations a means to improve and innovate, there is no consensus yet on how this improvement or reorganization should be achieved in practice. The lack of agreement was evident in the opposing comments made during the conference. Some who were present argued that the role of service designers should include business competency; others responded with comments that the strategy of service designers ought to only include ways to successfully collaborate with management without necessarily integrating business understanding into the service design discipline. The difference is that one side argues that designers should also be managers while the other position argues that there should be designers with an appreciation for the management aspect of the work. Such deontic positions are statements about recommended courses of action and reveal a discipline that is still in the process of figuring out how it ought to deal with issues of managing and designing.<sup>7</sup>

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5 Joe Heapy, "Make Yourself Useful," *Touchpoint* 1:3 (January 2010): 42–9.

6 Common service design deliverables currently include (among others) insights and findings from user research, storyboards, customer journey or experience maps, and service blueprint diagrams.

7 For development on the theme of managing as an activity of designing, see Richard J. Boland and Fred Collopy, eds., *Managing as Designing* (Stanford: Stanford University Press, 2004).

## Service Design and Wicked Problems

The last theme of the conference explored a shift in the service design community's interest—from well-structured problems<sup>8</sup> toward “wicked” types of complex social problems.<sup>9</sup> This vivid way of describing radically indeterminate problems was introduced and explained by Horst Rittel, a design theorist, during the early 1970s. According to Rittel, wicked problems are found in the context of differing human and social perspectives, contested values, and conflicting interests.

Before he turned to a methodology for dealing with wicked problems, Rittel was initially preoccupied with a linear approach to planning and designing. He labeled this type of approach, which is appropriate for “tame” or well-structured problems, the first generation design method.<sup>10</sup> This method is usually characterized by sequences, steps, or phases, he asserted, and is closely related to the field of operations research.<sup>11</sup> However, after Rittel began looking at wicked problems, he developed in his work a design methodology focusing on issues of planning, policy, and participatory design.

Like the first generation design method, service design has been compared to the field of operations research.<sup>12</sup> A significant amount of service design activity has thus far consisted of delivering insights and demonstrating innovative concepts resulting from linear research or linear product development processes.<sup>13</sup> However, service designers are becoming more interested in a wide array of social problems and are shifting toward a new paradigm that focuses on wicked problems.

This transition from a focus on tame problems to a focus on wicked problems surfaced several times during the course of the conference. In the panel on healthcare innovation, Lorna Ross, a design educator and manager at the Center for Innovation at the Mayo Clinic, raised concerns about recalibrating service design in healthcare. In her experience, service design initially promised organizations too much while only providing quick fixes and solving simple problems. Planning for healthcare education and integrating design within organizations are wicked problems since there are essentially contested values at the core of both activities; hence, the way service design communicates and executes its value propositions needs to be reexamined. In the same panel, Chris McCarthy, from Kaiser Permanente, shared that the most pressing issue in contemporary healthcare is the need for radical reform over entire systems. In order to motivate caregivers to think about social issues, he and his team at Kaiser Permanente have been responsible for building an awareness of external conditions, that is, the situations and environments outside of commonly understood domains within the organization.<sup>14</sup> For example, one issue is the fragility of healthcare systems in various countries. As decision makers enact policies around the world that continue to limit the access of health services

- 8 For an overview of well-structured problems, see Herbert A. Simon, “The Structure of Ill Structured Problems,” *Artificial Intelligence* 4 (1973): 181–201, and W. R. Reitman, “Heuristic Decision Procedures, Open Constraints, and the Structure of Ill-defined Problems,” In *Human Judgments and Optimality*, M. W. Shelley and G. L. Bryan, eds., (New York, NY: Wiley, 1964), 282–315.
- 9 See Richard Buchanan, “Wicked Problems in Design Thinking,” *Design Issues* 8:2 (Spring 1992).
- 10 Rittel also refers to this traditional and scientific method as the first generation systems approach. It is to be contrasted with the second generation systems approach, which is characterized by principles of dealing with wicked, or planning, problems.
- 11 See Horst W. Rittel, “On the Planning Crisis: Systems Analysis of the ‘First and Second Generations,’” *Bedrifts Økonomen*, 8: 390–6.
- 12 This is supported from the literature, where numerous topics around service design are published in journals such as *Production and Operations Management* and *Journal of Operations Management*. For example, see Susan M. Goldstein et al., “The Service Concept: The Missing Link in Service Design Research?” *Journal of Operations Management* 20 (2002): 121–34.
- 13 Chanpory Rith and Hugh Dubberly point out that most linear models of the design process trace their roots back to the Design Methods Movement, in Chanpory Rith and Hugh Dubberly, “Why Horst W. J. Rittel Matters,” *Design Issues* 22:4 (Autumn 2006): 1. Bruce Hanington shares an example of this type of approach that has been used by Carnegie Mellon University, in Bruce M. Hanington, “Relevant and Rigorous: Human-Centered Research and Design Education,” *Design Issues* 26:3 (Summer 2010): 21.

for people due to the decline of resources, governments and organizations face a significant challenge in maintaining services with less financial support. When the concerns of the internal organization include global issues such as this, service design has a role in stirring the passions of individuals and groups, and in actively seeking leaders within the organization who have the vision and wherewithal to champion programs and projects that align with needs of the greater society.

Robert Fabricant of Frog Design and Mark Jones of IDEO, both representing design agencies, also contributed to the theme of service design and wicked problems. Fabricant, who has successfully led a project that seeks to help HIV and AIDS patients in South Africa through a mobile technology and home-testing kit platform, introduced cybernetics and systems thinking as a possible way of grappling with the wicked problem of changing people's behaviors. Jones described the types of well-defined problems that preoccupy many designers and argued that the essence of service design might lie elsewhere—in the types of social problems that he described as being “hairy.”<sup>15</sup>

The points of the featured speakers were echoed by the voices of participants who asked whether service designers are properly using their skills to benefit the general public. One of Rittel's dilemmas after introducing the concept and reality of wicked problems was trying to decide whose values to use in determining what is best for society. How does one determine what is best for the larger, civic welfare? Service design must deal with “problems of equity that rising pluralism is provoking,”<sup>16</sup> and reconsider and reevaluate the idea of participation as it seeks to deal with wicked problems.

## Conclusion

Although the conference provided a view of the state of service design today, it also showed how the conversation is changing. During the entire conference, for example, the terms, “service blueprint” and “touch point,” were hardly used. In fact, one presentation suggested that the stabilized vocabulary of service design needs to be challenged because there have been significant changes in the way the subject is discussed and practiced. Using an appropriate vocabulary not only helps to capture some of the sophistication in service design today but may provide a way to project the hopes for where the discipline desires to be.

The community is also changing. As more services of higher quality are produced, as service design ideas become integrated into organizations, and as innovative plans and policies affect social problems, people will continue to contend with opposing ideas and discover opportunities for transformation at the locus of participation, and new participants will come forward. The argument

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14 This echoes Peter Drucker's point that information outside of an organization may be the most important information available to workers and managers. See Peter F. Drucker “The Information Executives Truly Need,” *Harvard Business Review* (January–February 1995): 54–62, and Peter F. Drucker, with Joseph A. Maciariello, “Information Tools and Concepts,” *Management: Revised Edition* (New York: HarperCollins Publishers, 2008), 341–55.

15 Others have also called wicked problem by other names. Russell Ackoff refers to wicked problems as “messy” problems, in Russell L. Ackoff, “Beyond Problem Solving,” *General Systems* 19 (1974): 237–9, and Robert Horn prefers to call them “social messes,” in Robert E. Horn, “Knowledge Mapping for Complex Social Messes” (paper presented to the Foundations in the Knowledge Economy at the David and Lucile Packard Foundation, July 16, 2001).

16 Horst W. Rittel and Melvin Webber, “Dilemmas in a General Theory of Planning,” *Policy Sciences* 4 (1973): 155–69.

is repeatedly being made that service design can play a role in improving our daily lives. The activity of designing for services is dynamic, and the pathways toward greater participation have yet to be explored.