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Introduction

As the twenty-first century continues to unfold so our relationships with the designed world become ever more crucial in determining how we shape and experience life. Alongside environmental change must be placed a second potential crisis—poverty of imagination. Now having the technologies to realize most anything we wish to do, the question is no longer "how can this be made" but "what do we want to do." And this challenge requires the kinds of creative imagination so intrinsic to design.

In this spirit Katerina Romanenko reminds us of a time in the early twentieth century when the driving mission of socialist propaganda was so intense that it had to invent ways of overcoming the technological constraints of that time in order to envision a new society. The Soviet State's assertion that "masses of workers, think much more in terms of images than in abstract formulas" challenged designers to subjugate the rudimentary printing technologies through the invention of photomontage techniques. Catherine de Smet, in giving us an admirably detailed account of Jean Widmer's creation of a logo for the Centre Georges Pompidou in the 1970s, also highlights the "sticky" quality such images can posses—the power they have to cling in our collective memory despite attempts to dislodge them.

Julka Almquist and Julia Lupton examine the relationships we have with designed artifacts as both users and consumers. On the one hand their usefulness to our functional existence and, on the other, the levels of meaning they transport into our collective psyche. In between these two imperatives they postulate a new middle ground for design practice that integrates affordance and meaning. Mads Nygaard Folkmann argues that it is not the practical or functional aspects of a designed object that first engages us but its aesthetic qualities—it is this aesthetic dimension that renders it a vital means of communication and shapes our sensuous experience of the world. Approaching the debate from another perspective Oscar Person and Dirk Snelders argue that families of things will have an intrinsic style that embraces both designed artifacts and everyday objects. In this framework they see brand styles as the means to identify a product's origin and make sense of its place in the world, so affording companies a competitive advantage in the market place.

Nathan Crilly shifts the debate into creative process. Using the case study of scientific progress set out in Thomas Kuhn's *The Structure of Scientific Revolutions* he demonstrates that innovation requires both long periods of incremental development and brief moments of creative leap—not one or the other. Alongside this Jon

Kolko sets out the drivers causing synthesis to emerge in complex design scenarios and Philippe d'Anjou addresses the moral character of the designer as a key factor in design ethics.

Bruce Brown
Richard Buchanan
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Affording Meaning: Design-Oriented Research from the Humanities and Social Sciences

Julka Almquist and Julia Lupton

User studies, whether conducted through qualitative ethnographic interviews or through more clinical and behaviorist analyses of specific affordances and interfaces, have remapped design research from a study of things to a study of people. Some design researchers have even argued that without the user, design does not exist.[1] Although this focus on users might appear to benefit the consumers of design by celebrating their personal experience and finding new ways to maximize their pleasures and productivity, critics of the user model, whose diverse ranks include Johan Redstrom,[2] as well as Ellen Lupton,[3] Peter Lunenfeld,[4] and Anthony Dunne and Fiona Raby,[5] have argued persuasively that user studies ultimately construe the human subject of design as a predictable bundle of reflexes and impulses that can be torqued, tuned, and tweaked in order to do the bidding—and the buying—prescribed by a consumer-savvy cabal of designers, engineers, and marketers. The word "user" itself communicates the terrors of addiction as well as the triumphs of functional mastery. In a landscape of diminishing economic and natural resources, the vision of the user promoted by mainstream design research is in dire need of revision. Meanwhile, consumers themselves are striking back, not only in the form of the D.I.Y., fair labor, and green movements, but also by simply withdrawing, out of sheer economic necessity, from the relentless rhythms of getting and spending that dictate our modern "user" lifestyle.

In this essay, we link the critique of the user (launched both within design studies and in the larger culture) to the specific methodological aim of bringing together methods from the social sciences—which have organized their vision of the user around the idea of affordances—and the humanities—which have by and large focused on the subjective, cultural, and ideological meanings of material things. Design research has no single definition. It is an interdisciplinary form of inquiry categorized in multiple ways, including: research with a focus on theory, practice, and/or production,[6] as design epistemology, design praxiology, and design phenomenology[7], and humanities-based design studies.[8,9] In this article, we focus on design research that addresses artifacts and the people who interact with them as its central focus—research that either does or could benefit from the combined resources of social-scientific and humanistic forms of inquiry that would bring together the search for

1 Elzbieta Kazmierczak, "Design as Meaning Making: From Making Things to the Design of Thinking." *Design Issues* 19 (2003), 45–59.

2 Johan Redström, "Towards User Design? On the Shift from Object to User as the Subject of Design," *Design Issues* 27:2 (2006), 123–39.

3 Ellen Lupton, *Thinking With Type* (New York: Princeton Architectural Press, 2004).

4 Peter Lunenfeld, *User: Infotechnodemo* (All Media Foundation, 2005).

5 Anthony Dunne and Fiona Raby, *Design Noire: The Secret Life of Electronic Objects* (Basel: Birkhäuser, 2001).

6 Richard Buchanan, "Design Research and the New Learning," *Design Issues* 17:4 (Autumn 2001), 3–23.

7 Nigel Cross, "Design Research: A Disciplined Conversation," *Design Issues* 15:2 (Summer 1999), 5–10.

8 Susan Roth, "The State of Design Research," *Design Issues* 15:2 (Summer 1999), 18–26.

9 Victor Margolin, "The Multiple Tasks of Design Research" in No Guru No Method? (Helsinki, Finland: University of Art and Design, 1998), 43–47.

utility with an appreciation of context, significance, and ideology.[10] For design researchers in the social sciences, utility is the essential question, namely "how things work . . . the degree to which designs serve practical purposes and provide affordances or capabilities,"[11] while significance tends to describe a secondary set of acquired features: "how forms assume meaning in the ways they are used, or the roles and meaning assigned to them, often becoming powerful symbols or icons in patterns of habit and ritual."[12] Humanist interpreters of design, working in fields such as art history, visual studies, cultural studies, and English and comparative literature, tend to emphasize meaning and interpretation at the expense of affordance and use. Derived from nineteenth-century historicism, hermeneutics, and philology, humanistic methods and sensibilities are organized around the historical specificity of cultures as well as the distinctiveness of individual responses to the designed world. The main contributions of the humanities to the study of design has thus been to understand the meaning of objects in particular moments of time, for particular groups and interests.[13] For most humanists, the idea that design might have "universal" applications, or that affordances might precede or subtend cultural differences, is a species of ideology that must be exposed and chastened.

Could humanists integrate aspects of universal design—based on the concepts of affordance and use—into their interpretive inquiries? And could design researchers trained in design, engineering, and the social sciences integrate their studies of use into a more nuanced account of meaning in its social and collective dimensions? In many design studies, a design succeeds if it is used correctly; any meanings brought to a design by a user are arbitrary and personal rather than a lived dimension of the object as a signifying thing in a complex network of meaningful exchanges. For many design researchers, meanings are simply subjective icing on the cake rather than shared codes baked into the object itself, connecting designer, producer, user, and the culture at large in a shared world. To continue the metaphor: might it be possible to have our cake and eat it too, to develop paradigms that envision the human endpoint of design as something more than the "user" of a specific, quantifiable function, while also conceiving of the meaning of objects in terms that allow for universal applications? Finding common ground between affordance and meaning could offer a collective space for interdisciplinary collaboration and new ways to approach both making and studying designed artifacts. Moreover, design itself, as a form of human making that crosses artistic and technological categories, poses to these disciplines the question of their own identities. This essay, co-authored by a humanist and a social scientist, aims to reconsider these divides by addressing tensions and commonalities between affordance, use, and meaning. Our analysis of humanistic and social-scientific convergences in design focuses on the idea of the user, a concept that has at once hallowed the human subject and reduced

10 John Heskett, *Toothpicks & Logos: Design in Everyday Life* (New York: Oxford University Press, 2002).

11 Ibid., 39.

12 Ibid., 40.

13 Examples of cultural studies of design from a humanistic perspective emphasizing historical context and meaning include: Richard A. Etlin, *Art, Culture, and Media Under the Third Reich* (Chicago: University of Chicago Press, 2002); Hal Foster, *Design and Crime and Other Diatribes* (London: Verso, 2002); Elizabeth E. Guffey, *Retro: The Culture of Revival* (London: Reaktion Books, 2006); Catherine McDermott, *Street Style: British Design in the 80s* (New York: Rizzoli, 1987); Nigel Whiteley, *Pop Design: Modernism to Mod* (London: The Design Council, 1987). See also the "Dress, Body, Culture" series published by Berg Press (Oxford and New York).

subjectivity to the exercise of a function, as a way of establishing the ethical and intellectual stakes of this project.

Manifest and Latent Functions and Meanings in Design

Several theoretical entrance points invite convergences between humanistic and social-scientific approaches to design. Consider, for example, Robert Merton's adaptation of manifest and latent functions for sociology in his seminal book *Social Theory and Social Structure* (1968). Merton presented a new application of functional analysis to the field of sociology. The word "function" is at the heart of Merton's analysis, and thus supports use- and user-oriented research, yet the distinction between manifest and latent meanings stems from psychoanalysis and Marxism, as well as from the hermeneutics of surface and depth associated with traditional exegetical models.[14,15] The purpose of Merton's adaptation was to differentiate "conscious motivations" from "objective consequences"[16] and to address the obvious or manifest social consequences of a human action or process with its unintended or latent social consequences. In conspicuous consumption, the manifest function is "the satisfaction of the needs for which these goods are explicitly designed"[17] and the latent function is the "heightening or reaffirmation of social status."[18]

Functional analysis is an appropriate framework to analyze designed artifacts, because while designers may have an intention related to how their work ought to be used or the niche it will fill in the lives of users, objects frequently take on additional roles and have unintended consequences. For example, young people transform handrails in parks into elevated tracks for skateboarding; after September 11, knitting needles were seen as potential weapons on airplanes; and phone books are often used as doorstops. None of these were the intended or manifest function of the artifact, but people who interact with the objects reveal their latent functions through acts of creativity, adaptation, and resistance.

It is important to note that designed artifacts have multiple potential latent functions. These latent *functions*, moreover, can also be conceived as latent *meanings*, understood both subjectively (the personal associations with an object that accrue over time) and intersubjectively (as part of cultural complexes of value and significance that require communities for their activation). Thus the "function" of conspicuous consumption unfolds as a primarily meaning-making activity, by which a consumer flags, brands, and publicly performs his or her place in the status landscape, which is also an object landscape. Understanding the role of conspicuous consumption in consumer choice has allowed marketers to build the struggle for status into the design and branding process. Sometimes, however, when latent meanings are rendered too visible, consumers step back, a retreat that can be signaled in satire and parody, in the hunt for "cooler" or more authentic products, or in a refusal to buy, and buy into, certain meaning systems.

14 Sigmund Freud, *The Interpretation of Dreams* (Raleigh, NC: Hayes Barton Press, 1929).

15 Hans Georg Gadamer, *Truth and Method* (New York: Continuum International, 2004).

16 Robert K Merton. *Social Theory and Social Structure* (New York: The Free Press, 1968), 115.

17 Ibid.,123.

18 Ibid.

The systematic seeking and uncovering of latent needs by market-driven researchers creates a designed world encrusted with a superabundance of gadgetry and "extra" features. A prime example is the marketing of highly specialized play and safety devices for small children who will rapidly outgrow them. Each moment of child development has become a veritable war zone fraught with its own special risks, from simple boredom to child abduction, with an array of carefully engineered weapons of mass production ready and waiting to protect our youngest civilians, including nanny cams, voice-activated crib lights, and toilet seat locks—all destined for the landfill as soon as the hapless youngster toddles to the next front of the safety wars. In these and other exfoliations of the planned obsolescence model of product design mastered in the heyday of American consumer modernism, "user-centered design," far from emancipating or empowering the user, marshals guilt, fear, and anxiety in order to market goods whose value is dubious.[19]

Yet the fact of latency also indicates the extent to which designs bear multiple kinds and levels of meaning, whose social unfoldings are multidirectional, affected by choices and actions that occur on all sides of the design equation. In *Thoughtless Acts: Observations on Intuitive Design*, Jane Fulton Suri of IDEO captures through digital snapshots the myriad ways in which people unconsciously exploit the latent uses of the designed environment (Image 1). She captures and then compares "uses" of the most minimal kind (a carton of milk abandoned on the edge of a rail next to an empty cup stowed at the base of a column), but the effect of these recordings is to bring forward the sense of order and efficiency that inhabits what appear to be random gestures.[20] The photographs themselves, left sublimely uncaptioned, become a kind of prose poetry, creating meanings through the juxtaposition of human creativity at its most accidental and unthought.

On the home front, equivalents to such spontaneous design solutions include the trend among a new generation of parents to train children to navigate table edges and stemware rather than coating their shared world in brightly colored plastic. Young people who grew up in the gated community of the child-proofed family room are now having kids themselves, and some are choosing to teach their offspring to adjust to a complex environment rife with both risks and pleasures rather than using consumer products to micromanage domestic environments that are no match in any case for the developmental leaps and lags of actual children co-existing in real space and time. These new "designs for parenting" are being generated from within households and communities rather than by manufacturers or social marketers. When built on the sensible navigation of such real hazards as choking, water danger, and car travel, these evolving parenting techniques promise not only to slow the landfill but also to nurture more resilient and creative adults.[21]

19 See George Nelson's classic defense of waste as a sign of efficiency in an industry-based society. George Nelson, "Obsolescence," *Perspecta* 11 (1967): 171–76. The essay was first published in *Industrial Design* in 1956. For an analysis of the planned obsolescence debate in Mid-Century Modern America, see Giles Slade, *Made to Break: Technology and Obsolescence in America* (Cambridge: Harvard University Press, 2006).

20 Jane Fulton Suri. *Thoughtless Acts: Observations on Intuitive Design* (San Francisco: Chronicle Books 2005).

21 On the psychological risks of the risk-free childhood, see Wendy Mogel, *The Blessing of a Skinned Knee: Using Jewish Teachings to Raise Self-Reliant Children* (New York: Penguin, 2001). On the design choices of a new generation of parents, see David Keeps, "The Kids Are All Right," *LA Times* 4/12/2007, "Home and Garden" section. See also "Homeland Security," in Ellen and Julia Lupton, *Design Your Life: The Pleasures and Perils of Everyday Things* (New York: St. Martins, 2009), 106–9.

Affordance and Use

The notion of affordance has developed significantly since introduced by psychologist J. J. Gibson in 1977. Gibson originally conceived of affordance from an ecological point of view centered on the potentiality of objects, surfaces, and materials. According to Gibson, affordance precedes subjectivity, interpretation, use, and meaning. For example, a supportive, flat ground affords walking, liquids afford pouring, a cave affords shelter. Gibson explained that affordances are physical facts that exist completely independently of interpretation or the relational interaction.

> And affordance is neither subject nor object:
> The affordance of something does not change as the need of the observer changes. Whether or not the affordance is perceived or attended to will change as the need of the observer changes but, being invariant, it is always there to be perceived. An affordance is not bestowed upon an object by the need of an observer and by his act of perceiving it. The object offers what it does because of what it is.[22]

These features apply to ecological phenomena, but also to human-made artifacts. The difference is that designers often embed artifacts with visual cues and indicators that suggest functionality; however, these artifacts still have multiple affordances—such as repurposing for use as a weapon, or as a doorstop, or as an icon for a social movement—that are not necessarily related to its intended function, or programmed into the object by its designer.

Don Norman's book *The Design of Everyday Things* (1988; 2002) appropriated and popularized the notion of affordance for design discourse. Norman defines affordance as the "perceived and actual properties of the thing, primarily those fundamental properties that determine just how the thing could possibly be used."[23] He writes further that "affordances provide strong clues to the operation of things."[24] This adapted definition repurposed the notion of affordance to mean something more like "perceived affordance," or what people understand to be the potential use of the object.

Theories of use, usability, and users have grown out of the fields of engineering, cognitive science, and design research, and have been heavily influenced by Norman's notions of affordance (or perceived affordance). In order to communicate the use of an artifact, the designer aims to make explicit specific affordances by intentionally embedding cues for people who use the object. Enter the notion of subjectivity and the term "user." Unlike Gibson's notion of affordance, in usability the relationship between the subject and the object matters. The designer becomes concerned with embedding content and action into artifacts so that the function of the object is immediately understood by the subject.

22 James J. Gibson. "The Theory of Affordances" in *Perceiving, Acting and Knowing: Toward an Ecological Psychology*, edited by R. Shaw and J. Bransford (New York: John Wiley & Sons, 1977), 78.

23 Donald Norman. *Design of Everyday Things* (New York: Basic Books, 2002, c.1988), 9.

24 Ibid., 9.

While use is most frequently the manifest function of an artifact, meaning can also fill this role. This is particularly true of religious and cultural artifacts that are made specifically to communicate messages that an intended group will understand, such as a cross in a Christian home or a mezuzah on the doorpost of a Jewish home. Branding offers contemporary and secular examples of meaning as a manifest function in design. Wedgewood, the English china company was one of the first companies to capitalize on the aristocracy as "legislators of taste" by marketing fine china to middle-class families in England.[25] By doing this they infused their china with a new meaningful layer, the premium or surplus value of *quality*. Branding has become the main means by which meaning shapes and infuses objects from their beginning. Successful branding is generated and maintained as much by consumers as by designers or marketers. In the evocative phrase of Adam Arvidsson, brands have become a "virtual factory"[26] in which consumers are set to work producing the brand not simply by buying a line of products, but by wearing its insignia, blogging about it, and even protesting changes in their brand (as has occurred with a number of Apple products). Although brands are collective in nature, defining a family of products and uniting a circle of consumers, individuals living in post-ethnic, post-regional, and post-secular identity formations are increasingly customizing their personae out of brand markers. *Brand culture* now overlaps in many ways with *fan culture*, which Henry Jenkins defines as "self-organizing groups focused around the collective production, debate, and circulation of meanings, interpretations, and fantasies in response to various artifacts of contemporary popular culture."[27] Fans, like members of brand communities, are not "users" in the narrow sense construed by behaviorist design research: they help fashion and redirect the meaning of the object and media they consume through their own commentary, fashion statements, and activism.

Design has moved toward a "user centered" model because of its powerful application to mass production. User-centered design research aims to uncover the needs of the user and to create designed artifacts that will appeal to as many consumers as possible. The concept of use in design tends toward universality, by aiming to address common human needs and to find easily legible, transcultural solutions for these needs. In a designed artifact, the intended use should be easily understood by the masses. According to Norman, if people do not properly interpret the message of the designed object, it has been poorly designed. This suggests that objects should embody some sort of universal language so that all people will be able to understand and interpret the message. This process can create deterministic designs and borders dangerously on a controlled, utopian ideal of human use. In any case, universality in design may not transcend culture so much as end up creating a new global culture, based on the easy transmissibility of use func-

25 Adam Arvidsson. *Brands: Meaning and Value in Media Culture* (New York: Routledge, 2006), 67.

26 Ibid.

27 Henry Jenkins, *Fans, Bloggers, and Gamers: Exploring Participatory Culture* (New York: New York University Press, 2006), 137.

tions through objects as well as the development of certain kinds of object-literacies among diverse consumer populations. Universality in design can strengthen local communities while also integrating them into larger global movements; the increasing distribution of mobile phones in developing countries, for example, has become a key means of keeping markets transparent for small producers and enabling collective organization around political issues.[28]

The exigencies of mass production and the methods of user-centered research have strongly pushed design toward engineering, by prioritizing usability, affordance, function, and constraint. As Johan Redström points out in his article "Towards User Design? On the Shift from Object to User as the Subject of Design," the subject has become more important than the object in much design and design research. The "subject" who emerges from user-centered design, however, is not a "humanist" subject; he or she is an "engineered" subject, who responds correctly to stimuli and thus can be shaped into a reliable member of mass society, whether conceived on consumerist or social-progressive grounds.[29] In *Design Noir: The Secret Life of Electronic Objects*, Anthony Dunne and Fiona Raby write: "This enslavement is not, strictly speaking, to machines, nor to the people who build and own them, but to the conceptual models, values, and systems of thought the machines embody. User-friendliness helps to naturalize electronic objects and the values they embody."[30] In *Thinking with Type*, Ellen Lupton makes a similar point: "The dominant subject of our age has become neither reader nor writer but user, a figure conceived as a bundle of needs and impairments—cognitive, physical, emotional. Like a patient or child, the user is a figure to be protected and cared for but also scrutinized and controlled, submitted to research and testing."[31] The word "user" suggests instrumentalization, calculation, and constraint, a behaviorist narrowing of personhood into reflex in the moment that we hold an object correctly or press the right key. The user mentality excludes meaning and improvisation in favor of targeted functions and knowledges based on ignorance.

28 Okoth Fred Mudhai, "Exploring the Potential for More Strategic Use of Cell Phones," *Reformatting Politics: Information Technology and Global Civil Society*, ed. Jodi Dean, Jon W. Anderson, and Geert Lovink (New York: Routledge, 2006), 107–20. See also Pierre Lévy on the salutary effects for global politics of the "universal-without-totality" produced by the collective intelligence of digital communities. *Cyberculture*, trans. Robert Bononno (Minneapolis: University of Minnesota Press, 2001).

29 Johan Redström. "Towards User Design? On the Shift from Object to User as the Subject of Design," *Design Studies* 27 (2006), 123–39.

30 Anthony Dunne and Fiona Raby, *Design Noir: The Secret Life of Electronic Objects* (Basel, Birkhäuser Basel, 2001), 30

31 Ellen Lupton. *Thinking With Type* (New York: Princeton Architectural Press, 2004), 73

Image 1
Atomic Kitchen advertisement
Redrawn for the authors by
Ellen Lupton.

This ad from the 1950s, reproduced by Brian Alexander in *Atomic Kitchen: Gadgets and Inventions for Yesterday's Cook*[32] offers an instructive allegory for the condition of the user in contemporary life (Image 1). Usability is measured by ease, efficiency, and transparency of use—so straightforward that you can do it blindfolded—but the focus on use also depends on a more insidious blindfolding: a willed ignorance as to the provenance of the canned food, its nutritional decline on the way from field to factory to kitchen, and the fate of the discarded container, for example.

As a result of Norman's work, affordance is often associated with use, but it can also contribute to meaning. In *The Meaning of Things: Domestic Symbols and the Self*, the landmark sociological study of household artifacts, Csikszentmihalyi and Rochberg-Halton found that plates, cups, and other fragile artifacts were most frequently mentioned as a significant symbol of ethnic background and family traditions. The authors suggest that the fragile nature of these objects contributes to their meaning: "Given a number of fragile objects, the majority of them are soon bound to be broken. To preserve a breakable object from its destiny one must pay at least some attention to it, care for it, buffet it from the long arm of chance. Thus, a china cup preserved over a generation is a victory of human purpose over chaos, an accomplishment to be quietly cherished, something to be 'kind of proud' of."[33] Their analysis recalls Martin Heidegger's account of care (*Sorge*) as a mode of concern for the world, guided "not by knowledge or explicit rules, but by its informal know-how."[34] Fragility is a physical attribute of things that "affords" their breaking, shattering, or destruction. Certain patterns of use are designed to ward off such destruction (such as keeping breakables out of the reach of children, or setting items on a firm, flat surface that affords resting). These protective, careful patterns of use also help build and protect the meaningfulness of certain types of objects, such as family symbols, holiday icons, or objects of monetary value.

Norman's notion of affordance, unlike Gibson's, implies the subject's interpretation of the object, insofar as he shifts affordance from potentiality (in the object) to use (by the subject). Norman frames interpretation, however, within a limited plane of functionality—do I as a user of the object respond appropriately to the cues given to me? And how might those cues be improved in order to garner more accurate responses? The subjective element opened up in Norman's work does not extend into broader processes of cultural meaning-making. Here, it seems that design research would benefit from the humanities, whose more capacious and flexible account of signification and subjectivity might provide accounts of the user that resist or take issue with the social engineering at the heart of the modernist design programs launched from both capitalist and socialist agendas. For what is at stake in finding convergences between social-scientific and humanistic approaches to design is not simply methodological. It is also ethical and political, bearing on the way

32 Brian S. Alexander, *Atomic Kitchen: Gadgets and Inventions for Yesterday's Cook* (Portland, OR: Collectors Press, 2004), 147.

33 Mihaly Czikszentmihalyi and Eugene Rochberg-Halton, *The Meaning of Things: Domestic Symbols and the Self* (New York: Cambridge University Press, 1981), 83.

34 Michael Inwood, "Care," *Heidegger Dictionary* (London: Blackwell, 1999), 36.

we live with design, now. Yet neither Gibson's nor Norman's writings have had much impact in the humanities, where the idea of affordances rarely surfaces in any analytic context. We contend that humanists would do well to consider affordances in their analysis of cultural artifacts. How, for example, does the physical design of magazines and newspapers "afford" certain types of reading and readers under conditions of industrialization? How did the spatial division of Shakespeare's stage into plateau and gallery "afford" certain narrative solutions? It is not that humanists don't ask such questions—they do—but they rarely access a design vocabulary in order to mount their arguments. And when they do turn to analyzing objects of design, questions of culture, taste, and historical context overshadow problems in affordance. The functional specificity of use—the fine details of shape, size, hardness, tactility, and the phenomenology of human responsiveness to them—disperses into more generalized accounts of use-value or symbolic functions that often miss the concrete singularity of objects as made things. Too often, such interpretations leave designers cold. In the humanistic study of design, *cultures* may be specific and particular, bound by time and place, by ethnicity and gender, but *objects* tend to get lost in the cultural containers that frame them. There is still, it seems, a conversation to take place between social scientists and humanists on the question of design and its users.

New Scenes for the User: Design Ecology and Interobjectivity

Two paradigms for rethinking the relation of the user to designed objects offer promising grounds for launching such a conversation. Returning affordance theory to its origins in ecology discloses broader scenarios for understanding the coexistence of persons and objects in built and natural environments, while the idea of "interobjectivity" associated with the work of Bruno Latour imagines a social theory of things that would include objects as "comrades, colleagues, partners, accomplices, or associates in the weaving together of social life."[35]

Recall that Gibson's concept of affordances began as an *ecological* idea, a way of understanding the various forms of life that a particular habitat could afford to a variety of species. Affordances are not only perceivable by humans; they are also actualized by animals and by other ecological variables. For example, dry wood affords being burned with fire, mice afford being eaten by owls, and shiny plastic bottle caps afford being treated as food by seabirds. (In the latter case, the plastic pieces fill up the stomach cavity and ultimately starve the bird.) For Gibson, when a creature (whether human or animal) perceives an affordance, meaning is not added to the object or environment in a way that designers or users agree upon. Perceiving affordances is a "process of perceiving a value-rich ecological object."[36] Affordance theory, however, has been blindfolded into a theory of objects and their uses; the environmental framework has largely been lost. The ecological origins of the term

35 Bruno Latour, "On Interobjectivity," *Mind, Culture and Activity* 3:4 (1996), 235.

should call us back to a broader environmental view of the object world—"environmental" not only in the contemporary sense of sensitive to resources and sustainability, but also in the sense of engaging interconnected networks of meanings and uses by multiple constituencies, including those who may not be the intended users, whether it's skateboarders or seabirds. Ecology sketches scenarios for creative adaptation as well as reminders of the fragility of equilibrium. In *Information Ecologies: Using Technology with Heart*, Bonnie Nardi and Vicki O'Day develop the ecology metaphor, which, they argue, has the heuristic advantage of replacing "resistance" with "participation" and combining the holistic frame of systems analysis with an attention to locality, diversity, and change.[37] The environment is what "environs" or surrounds us. The emphasis in the humanities on context and culture can help us map environments in terms of meaning and significance as well as relations of force and ideology, while the social-scientific development of ethnographic tools for design research can further unfold the intersubjective dimensions, communal settings, and material costs that attend living with objects without losing sight of usability.

Although Nardi and O'Day are interested in environments modified by computing, the ecological paradigm could also be applied to other forms of design and to the arts of the past as well as the present. Take for example Botticelli's *Primavera*, a masterpiece of the fine arts canon.

Although we associate the painting with the archival walls of the Uffizi Gallery (along with soap dish souvenirs), recent sociocultural studies of the painting have disclosed its relationship to the *cassone* tradition (painted wedding chests designed as gifts and paraded through the streets as part of marriage festivals).[38] This image, originally a *spalliera* (painted headboard) behind a *lettucio* (day bed), affords reading from right to left rather than left to right, contrary to most paintings in the Western tradition, suggesting that the panel was initially positioned in a room whose layout promoted access from the right side of the painting. Evoking and even re-enacting rites of spring from both rural folklore and classical myth, the *Primavera* is a species of calendar art that not only represents but also presents—makes present through enactment—a participatory and embedded relationship to natural time. The image must be seen, that is, not as a window onto another world, but as part of a total environment composed of symbol-laden furnishings within a space subject to both real and ritualized mappings. The case of the *Primavera* demonstrates how an ecology of meanings and affordances offers paradigms for understanding the complex relations among things, persons, and environments, in designs both from the past and for the future, inviting not only a holistic mode of inquiry towards human artifacts and their users but also an attitude of concern, care, and engagement in response to the interlocking habitats of persons, things, rituals, and resources that surround and define us.

36 Gibson, 140.

37 Bonnie A. Nardi and Vicki L. O'Day, *Information Ecologies: Using Technology with Heart* (Cambridge: MIT Press, 1999). Nardi and O'Day critique Norman Holland's "tool" model of affordances for limiting the scope of human participation in technological adoption and adaption (28–30), and they propose ecology as a more capacious metaphor that "stimulates conversations for action" (50). They summarize the ecological model: "An information ecology is a system of parts and relationships. It exhibits *diversity* and experiences continual evolution. Different parts of an ecology *coevolve*... Information ecologies have a sense of *locality*" (50–51).

38 On Botticelli's *Primavera* and the cassone tradition, see Charles Dempsey, *The Portrayal of Love: Botticelli's Primavera and Humanist Culture in the Time of Lorenzo the Magnificent* (Princeton: Princeton University Press, 1992). On the cassone tradition and rituals of marriage in and between private and public space, see Brucia Witthoft, "Marriage Rituals and Marriage Chests in Quattracento Florence," *Artibus et Historiae* 3:5 (1982), 43–59.

Bruno Latour is the architect of interobjectivity and "actor network theory." His account of objects as players in social networks composed of both human beings and things comes out of a sociological tradition, but the continental, theoretical character of his thought has given his work special audience in the humanities, which have traditionally been open to paradigms driven by other than empirical and quantitative methods.[39] Arguing that social theory has ignored the importance of objects, Latour insists that made things are fundamental to human interaction, indeed that they can be conceived as actors (or what he calls "actants") in their own right insofar as object and user exchange attributes in the process of use. Latour's search for a "social theory interested in sharing sociality with things"[40] offers ripe territory for design research that would combine sociological and humanistic methods in order to construct a conception of the human subject of design beyond the instrumentalizing reification of "the user." Latour's categories resist the dualistic distinction between technology (the world of artifacts) and society (the world of human subjects). Technology and people both participate in and mediate relational networks, and at the same time they are the outcome of those networks; the positions of subject and object themselves do not exist other than in the context of relationships and interactions, and the multilateral nature of interaction narrows the gap between them. Moreover, Latour puts meaning at the center of design: "Design lends itself to interpretation; it is made to be interpreted in the language of signs. . . .Wherever you think of something as being designed, you bring all of the tools, skills, and crafts of interpretation to the analysis of that thing."[41] As such, designed things are not *objects of fact* so much as *objects of concern:* "complex assemblies of contradictory issues" that institute relationships other than ownership (of things by people) or instrumentalization (of people by things), including such postures of attention and attentiveness as "attachment, precaution, entanglement, dependence, and care."[42]

Although their interests and orientations are very different, Gibson and Latour both share an investment in bridging the subject-object divide through more fluid, relational, and environmental conceptions of objects in the world. While affordances belong to neither subject nor object, they are potentialities that exist in the world and can do something in it, implying that objects have a certain kind of agency or effectivity. It is possible to employ the theory of affordances to support Latour's controversial notion that objects have agency, especially in situations when human (or animal) subjects interact with the object world in unexpected ways, beyond the designs of the designer. In such circumstances, the object takes on "a life of its own," becoming a new actant in an unpredictable situation or scenario.

The paradigms of both design ecology and interobjectivity rework the conceptual potentialities of affordance theory away from narrowly conceived tool models and towards broader vistas

39 Literary scholars who have used Latour to analyze texts as material artifacts, or the object world within texts, or objects in drama, include Julian Yates, *Error, Misuse, Failure: Object Lessons from the English Renaissance* (Minneapolis: University of Minnesota Press, 2003); Jonathan Gil Harris, *Untimely Matter in the Time of Shakespeare* (Philadelphia, University of Pennsylvania Press, 2009); and Aaron Kunin, "Character Lounge" *Modern Language Quarterly* 70:3 (2009, 291-317).

40 Bruno Latour, "On Interobjectivity," *Mind, Culture and Activity* 3:4 (1996): 237.

41 Bruno Latour, "A Cautious Prometheus? A Few Steps Toward a Philosophy of Design (With Special Attention to Peter Sloterdijk." Keynote lecture for the Networks of Design, Meeting of the Design History Society, Falmouth, Cornwall, 3 September 2008. http://www.bruno-latour.fr/articles/article/112-DESIGN-CORNWALL.pdf; accessed 2/1/2009.

42 Ibid, 4, 2.

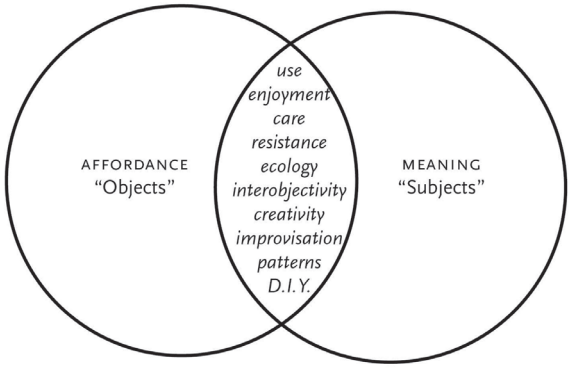


Figure 1
Venn diagram of Affordance and Meaning
Examples of ideas, activities and people that constitute the region of common ground between affordance, use and meaning

of thing-human interaction involving multiple forms of agency and signification. We are not suggesting that use should cease to be the aim or manifest function of design, but rather that the task of design research—both research in the service of the design process, and research into the role design plays in contemporary and historical life—should be oriented around the common ground between use, meaning, and affordance, which is also the common ground between designers and "users."

This dynamic and fluid region includes the latent functions and meanings of designed objects and environments that are brought out by acts of use, repurposing, and interaction, and thus constitutes the space in which "users," construed and constrained narrowly by instrumentalizing design thinking, become genuine human subjects, bearing memories, desires, and creative capacities that cannot be fully predicted by research conceived on determinist or behaviorialist grounds. Some models for this kind of work include Christopher Alexander's *Pattern Language*, where the idea of pattern implies a universality of function, while language indicates a semantics of meaning.[43] Alexander's patterns are not a shopping list of designer add-ons but rather scenes of action that overlap and intersect, navels of interlocking uses that radiate outwards and cross each other, creating new opportunities for interaction and signification. Another area of convergence is the new interest in objects as both functional and meaningful; Sherry Turkle's *Evocative Objects: Things We Think With* takes objects as repositories of cultural and personal significance within a field of discourse defined more by the history of science and technology than the history of art.[44] And it's not just academic. New social movements emphasizing sustainability, fair labor, and D.I.Y. ("Do It Yourself") processes and communities are staking their interests in this dynamic middle ground. Design research directed towards the fluid threshold constituted by affordance and meaning would thus bring together empirical and hermeneutic, quantitative and qualitative, behaviorist and psychoanalytic, methods and perspectives, in order to understand and engage with design in its genuine complexity and promise.

43 Christopher Alexander, Sara Ishikawa, Murray Silverstein, with Max Jacobson, Ingrid Fiksdahl-King, and Shlomo Angel. *A Pattern Language* (New York: Oxford University Press, 1977).

44 Sherry Turkle (ed), *Evocative Objects: Things We Think With* (Cambridge: MIT Press, 2007). See also Joshua Glenn and Carol Hayes, *Taking Things Seriously: 75 Objects with Unexpected Significance*; Bill Brown, ed., *Things* (Chicago: University of Chicago Press, 2004); and Ellen and Julia Lupton, *Design Your Life: The Pleasures and Perils of Everyday Things* (op cit.).

Abductive Thinking and Sensemaking: The Drivers of Design Synthesis

Jon Kolko

Overview: Making Sense of Chaos

Designers, as well as those who research and describe the process of design, continually describe design as a way of organizing complexity or finding clarity in chaos. Jeff Veen, founder of Adaptive Path, has noted that "Good designers can create normalcy out of chaos."[1] Jim Wicks, Vice President and Director of Motorola's Consumer Experience Design group explains that "design is always about synthesis—synthesis of market needs, technology trends, and business needs."[2] During synthesis, designers attempt "to organize, manipulate, prune, and filter gathered data into a cohesive structure for information building."[3] Synthesis reveals a cohesion and sense of continuity; synthesis indicates a push towards organization, reduction, and clarity.

Yet despite the acknowledged importance of this phase of the design process, there continues to appear something magical about synthesis when encountered in professional practice: because synthesis is frequently performed privately ("in the head" or "on scratch paper"), the outcome is all that is observed, and this only after the designer has explicitly begun the form-making portion of the design process. While other aspects of the design process are visible to non-designers (such as drawing, which can be observed and generally grasped even by a naïve and detached audience), synthesis is often a more insular activity, one that is less obviously understood, or even completely hidden from view. Designers may follow a user-centered discovery process to immerse themselves in a particular subject or discipline, and then go "incubate" that material. After a period of reflection, they will produce a tangible artifact as a visual representation of the reflection. When synthesis is conducted as a private exercise, there is no visible connection between the input and the output; often, even the designers themselves are unable to articulate exactly why their design insights are valuable. Clients are left to trust the designer, and more often than not, the clients simply reject the insight as being "blue sky" or simply too risky.

For example, a designer developing a new digital device might study the use of digital devices used in the workplace. Typically, a designer will observe four or five users as those individuals conduct their work. The designer will ask questions of

1 Jeff Veen, *The Art and Science of Web Design* (Indianapolis: New Riders Press, 2000).

2 Jim Wicks, "Weaving Design into Motorola's Fabric," *Institute of Design: Strategy Conference.* 2006. <http://trex.id.iit.edu/events/strategyconference/2006/perspectives_wicks.php> (accessed November 3, 2008).

3 Jon Kolko, "Information Architecture and Design Strategy: The Importance of Synthesis during the Process of Design," *IDSA 2007 Educational Conference Proceedings* (San Francisco: IDSA), 2007.

each user about their jobs and record details of their responses. The designer might also take screen shots or photographs of the tools being used, and probe for details about each item. The designer will then return to the design studio. In the privacy of his or her natural work place, the designer will attempt to make sense of what he or she has learned. The goal is to find relationships or themes in the research data, and to uncover hidden meaning in the behavior that is observed and that is applicable to the design task at hand.

The user research sessions will produce pages of verbal transcript, hundreds of pictures, and dozens of artifact examples. Because of the complexity of comprehending so much data at once, the designer will frequently turn to a large sheet of paper and a blank wall in order to "map it all out." Several hours later, the sheet of paper will be covered with what to a newcomer appears to be a mess—yet the designer has made substantial progress, and the mess actually represents the deep and meaningful sensemaking that drives innovation. The designer will have identified themes, and will better understand the problem he or she is trying to solve; the designer will have discovered "the whole," as described by Daniel Fallman: "Fieldwork, theory, and evaluation data provide systematic input to this process, but do not by themselves provide the necessary whole. For the latter, there is only design."[4]

A Lack of Formality

To an observer (commonly a client), the physical output, themes, and design ideas produced seem arbitrary, or *magically derived*. The artifacts developed by the designer are messy, usually drawn in the midst of deep and reflective thinking; they are sketches drawn in Sharpie, incomplete sentences, and crude diagrams lacking adequate captions or descriptions. If the beginning state (the research data) is compared to the end state (the design idea), it is not immediately clear how one derived the latter from the former. It can be argued that *the more innovative the output*, the more difficult it is to identify how the idea was developed at all. Yet the incubation period described above can be well structured, and things that occur during that period are both repeatable and comprehendible. It is only the lack of understandable documentation, or the decision to not share that documentation, that creates the sense of *magic*.

And the *magic* may well be desirable by some clients, as it hints that their money has been well spent. (After all, they feel that they've hired magicians!) But the notion that design synthesis is magical and difficult to formalize has led to a number of very large problems that plague the industries of designed artifacts:

Clients don't see the relationship between design research and design ideas, and therefore discount the value of design research and design synthesis entirely. Because synthesis is frequently relegated to an informal step in the overall process, it is practiced implicitly; a single designer forges connections in the privacy of her own thoughts,

4 Daniel Fallman, "Design-oriented Human-Computer Interaction." *Human Factors in Computing Systems, the Proceedings of CHI* (Association for Computing Machinery, 2003), 225–32.

and performs only rudimentary sensemaking. The design output and solutions can be unique, novel, and even exciting, but because there is no artifact-based procedural trail, the client isn't aware of the various internal deliberations that have occurred. After encountering several design projects that include implicit design synthesis, a client may proclaim that they don't see the value in a discovery phase for future design activities. They are, of course, right: they didn't *see* anything of value, and so they assumed the phase to be a waste of resources.

Design consultancies don't plan for, assign resources to, or appropriately bill for synthesis activities, and so design synthesis happens casually or not at all. If there is no formal period of time allotted for design synthesis methods, and no formal deliverables associated with these methods, a strong message is sent to the designer: synthesize on your own time, or not at all.

Reflective and messy synthesis processes are considered a "waste of time," as they aren't positioned as actionable or immediately predictive. The output of design synthesis is frequently incomplete or intangible—the value of the output is not immediately evident, as the results are "half baked." Synthesis often results in a number of high level themes and paradigms that help shape future design activities, but these high level and conceptual elements may be seen as too abstract to justify the time and resources spent.

These problems are roadblocks to innovation, and illustrate a deep disconnect between the core process of insight development and the billed process of product development. Yet synthesis methods have been continually referenced as critical in sensemaking, organization, and in drawing the important connections between apparently unrelated elements. These are the keys for relating research to design—synthesis methods are the ways in which ethnographic insights lead to new, innovative, appropriate, or compelling ideas.

These principles and methods are teachable, repeatable, and understandable. They are creative activities that actively generate intellectual value, and they are unique to the discipline of design. Most importantly, when applied and formalized, these activities are billable and immensely useful in the development of novel, useful, and appropriate designs.

I. Theoretical: Grounding Philosophies of Synthesis

Synthesis is an abductive sensemaking process. Through efforts of data manipulation, organization, pruning, and filtering, designers produce information and knowledge. The methods and principles described later (in Section II) share a common grounding philosophy that is tied to both cognitive psychology and mathematics. This philosophy helps to explain why synthesis methods are effective, and better describes the long history of research done in this domain of complex problem solving.

Sensemaking

Klein, Moon, and Hoffman define sensemaking as "a motivated, continuous effort to understand connections (which can be among people, places, and events) in order to anticipate their trajectories and act effectively."[5] This definition builds on Brenda Dervin's much more abstract description. Dervin explains that "Sense-Making reconceptualizes factizing (the making of facts which tap the assumed-to-be-real) as one of the useful verbings humans use to make sense of their worlds."[6] In plain language, both definitions position sensemaking as an action oriented process that people automatically go through in order to integrate experiences into their understanding of the world around them.

Common to all methods of synthesis is a "sense of getting it out" in order to identify and forge connections. This is an attempt to make obvious the sensemaking conditions described above; emphasis is placed on finding relationships and patterns between elements, and forcing an external view of things. In all of the methods, it is less important to be "accurate" and more important to give some abstract and tangible form to the ideas, thoughts and reflections. Once externalized, the ideas become "real"—they become something that can be discussed, defined, embraced, or rejected by any number of people, and the ideas become part of a larger process of synthesis. Essentially, sensemaking is an internal, personal process, while synthesis can be a collaborative, external process.

The data that has been gathered from contextual research will often take many forms; designers gather and create photographs, video clips, transcripts, magazine clippings, and other artifacts related to the problem or opportunity context. In an effort to maintain some sense of coherence, designers frequently attempt to horde the content in their laptop—the digital format allows for ease of organization in the form of files, folders, and databases. This digital structure is, however, arbitrarily imposed by the constraints of the popular software tools and operating systems. The physical limitation of the laptop (the size), combined with the digital limitations of the software (the organizational schema), dramatically limits the designers' ability to see the forest for the trees: they lose the ability to understand the research in totality and are limited in their ability to freely manipulate and associate individual pieces of data.

Synthesis requires a designer to forge connections between seemingly unrelated issues through a process of selective pruning and visual organization. Because of the vastness of data gathered in even a simple design problem, the quantity of data that must be analyzed is often too large to hold in attentive memory at one time, and so a designer will externalize the data through a process of spatialization. The tools that allow for this are presently quite limited—a big wall, a marker, and lots of sticky notes are some of the most common tools used by designers for this process. These tools help the designer gain a strong mental model of the design space; the

5 Gary Klein, Brian Moon, and Robert Hoffman, "Making Sense of Sensemaking 1: Alternative Perspectives." *Intelligent Systems* (IEEE) 21:4 (July/August 2006), 71.

6 Brenda Dervin, "Sense-Making's Journey from Metatheory to Methodology to Methods: An Example Using Information Seeking and Use as Research Focus," in *Sense-Making Methodology Reader* (Cresskill, NJ: Hampton Press, 2003), 141–46.

externalization of the research data allows for a progressive escape from the mess of content that has been gathered.

Once the data has been externalized and the literal mess begins to be reduced, the designer begins the more intellectual task of identifying explicit and implicit relationships, physically drawing out these content-affinities through the process of organization. The designer begins to move content around, physically, placing items that are related next to each other. As described above, this process is less about finding "right" relationships and more about finding "good" relationships. All of the content is related in some way, but the important connections are frequently those that are multi-faceted, complex, and rooted in culture. Thus, it may be necessary to duplicate content (to allow it to connect to multiple groups), or to abandon or rearrange already established groupings several times during this process.

Once the groupings begin to emerge through the process of organization, the groupings can be made explicit by labeling them. The grouping label captures both the literal and the implied contents of the group—it makes obvious the meaning that has been created through the process of organization.

Frequently, designers will spend a great deal of time creating a war-room style wall of data, organizing and pinning the material up in the manner described above—and then ignore this content for the remainder of the project. The designer needs the organization in order to gain a complete picture of the design space; they then draw conclusions, and as they progress through the phase of creative ideation, the synthesis wall becomes unnecessary. It has served its purpose in delineating the design space, has allowed for a collaborative process of sensemaking, and has provided a spatial understanding of structure.

Thus, one of the most basic principles of making meaning out of data is to externalize the entire meaning-creation process. By taking the data out of the cognitive realm (the head), removing it from the digital realm (the computer), and making it tangible in the physical realm in one cohesive visual structure (the wall), the designer is freed of the natural memory limitations of the brain and the artificial organizational limitations of technology. Content can now be freely moved and manipulated, and the entire set of data can be seen at one time. Implicit and hidden meanings are uncovered by relating otherwise discrete chunks of data to one another, and positioning these chunks in the context of human behavior.

Abduction

Synthesis is an abductive sensemaking process. Abduction can be thought of as the "step of adopting a hypothesis as being suggested by the facts . . . a form of inference."[7] To better understand abduction, it's necessary to understand the duality of the forms of logic

that have been more traditionally embraced by western society in argument: deduction and induction.

A valid deductive argument is one that logically guarantees the truth of its conclusion, if the premises that are presented are true. This is the form of logic that is traditionally taught in mathematics courses and manifested in logic proofs:

A is B.
All Bs are Cs.
A is, deductively, C.

This form of logic is one that is self contained, and any argument that uses deduction is one that cannot offer any *new findings* in the conclusions—the findings are presented in the premises that hold the argument to begin with. That is, A, B, and C all exist in the premises that were presented.

An inductive argument is one that offers sound evidence that something might be true, based on structured experience. This is the form of logic traditionally associated with scientific inquiry:

Each time I do A under the same conditions, B occurs.
Inductively, the next time I do A under these conditions, B will occur.

Subsequent experiences may prove this wrong, and thus an inductive argument is one where the premises do not guarantee the truth of their conclusions. Like deduction, induction cannot offer any "new findings" contained within the logic of the argument.

Abduction has been described by Roger Martin (Dean of the Rotman School of Management) as the "logic of what might be," and while this certainly serves to embody this logic in the context of design, it isn't entirely accurate. Instead, abduction can be thought of as the *argument to the best explanation*. It is the hypothesis that makes the most sense given observed phenomenon or data and based on prior experience. Abduction is a logical way of considering inference or "best guess" leaps. Consider the example *When I do A, B occurs:*

I've done something like A before, but the circumstances weren't exactly the same.
I've seen something like B before, but the circumstances weren't exactly the same.
I'm able to abduct that C is the reason B is occurring.

Unlike deduction or induction, abductive logic allows for the creation of new knowledge and insight—C is introduced as a best guess for why B is occurring, yet C is not part of the original set of premises. And unlike deduction, but similarly true to induction, *the conclusions from an abductive argument might turn out to be false, even if the premises are true.*

Design synthesis is fundamentally a way to apply abductive logic within the confines of a design problem.[8] The various constraints of the problem begin to act as logical premises, and the

7 Charles S. Peirce, "On the Logic of Drawing History from Ancient Documents," in *The Essential Peirce: Selected Philosophical Writings, 1893–1913*, by Charles S. Peirce, edited by Peirce Edition Project (Bloomington: Indiana University Press, 1998), 95.

designer's work and life experiences—and their ease and flexibility with logical leaps based on inconclusive or incomplete data—begin to shape the abduction. Abduction acts as inference or intuition, and is directly aided and assisted by personal experience. Yet the personal experience need not be with the specific subject matter of the design problem. The abduction itself can be driven by any design or cultural patterns that act as an argument from best explanation. As described by Peirce, "The abductive suggestion comes to us like a flash. It is an act of *insight*, although extremely fallible insight. It is true that the different elements of the hypothesis were in our minds before; but it is the idea of putting together what we had never before dreamed of putting together which flashes the new suggestion before our contemplation."[9]

Johnson-Laird has argued contradictorily that, in the context of generative and creative problem solving, the insight is developed not in a "flash" at all. Instead, a four step process leads to an insight, which only *seems* to appear instantly:

> The current problem solving strategy fails to yield a solution, given the existing constraints.
>
> There is a tacit consideration of the new constraints in the strategy.
>
> The constraints are relaxed (or changed) in a new way, thus broadening the problem space and allowing for further consideration.
>
> Many changes in constraints lead nowhere, but, with perseverance, a change may be made that leads at once to a solution of the problem.[10]

Both Peirce and Johnson-Laird agree that abductive reasoning is related to insight and creative problem solving, and it is this creative problem solving that is at the heart of the design synthesis methods that follow.

II. Applied: Methods of Synthesis

A Synthesis Framework

The logical and cognitive background described above points to an action-framework of synthesis: there are specific types of actions taken by the designer during synthesis that yield a positive result in terms of both abduction and sensemaking. These are the acts of prioritizing, judging, and forging connections.

Prioritizing. A large quantity of data is gathered while approaching a given design problem. Stakeholder interviews, user interviews, market research, cultural trends, and forecasting all produce quantities of data. During the process of synthesis, the designer must decide that one piece of data is more important than another. This is accomplished by using an often implicit scale of importance, or a set of guidelines upon which to compare the data.

8 R. Coyne, *Logic Models of Design* (London: Pitman, 1988).

9 Charles S. Peirce, "Pragmatism as the Logic of Abduction," in *The Essential Peirce: Selected Philosophical Writings, 1893–1913*, by Charles S. Peirce, edited by Peirce Edition Project (Bloomington: Indiana University Press, 1988), 227.

10 Philip Johnson-Laird, "The Shape of Problems." in *The Shape of Reason: Essays in Honour of Paolo Legrenzi*, by V Girotto, edited by V Girotto, 3–26. (Psychology Press, 2005).

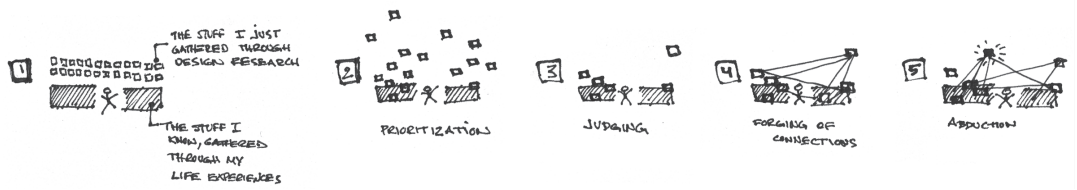


Figure 1
Synthesis process, visualized. The illustration oversimplifies this process for clarity; the actual process is not linear, nor is it as "clean" as shown.

The scale of importance is subjectively derived (but identified in a "reasonable" manner—not arbitrarily), but the use of this scale is then generally objective. (Within the system each element is compared on a consistent basis.) Data prioritization will eventually identify multiple elements that can be seen as complementary, and thus a hierarchical data structure is created.

Judging. Not all of the data identified in a discovery process is relevant. The process of synthesis forces the definition of relevance, as the designer will pass the gathered data "through a large sieve" in order to determine what is most significant in the current problem solving context. Synthesis methods, then, require a constant reassessment of the current state as compared to the unknown end state.

Forging of connections. During synthesis, it is not the discrete elements of data that are interesting so much as the relationship *between* these elements. Identifying a relationship forces the introduction of a credible (although rarely validated) story of why the elements are related. This is an abductively logical story, positing a hypothesis based on inference. The activity of defining and forging connections actively produces knowledge, in that new elements (gleaned from prior experiences in life) are combined with existing elements.

Three methods of synthesis are introduced below; each of the methods emphasizes *prioritization*, *judging*, and the *forging of connections*. These methods illustrate pragmatic approaches to design synthesis that can be applied in design problems of any discipline or subject matter.

Method: Reframing

Designers approach creative problem solving in the conceptual context of a "frame." Schön says that a creative design "hypothesis depends on a normative framing of the situation, a setting of some problems to be solved."[11] This normative framing is a perspective that highlights "a few salient features and relations from what would otherwise be an overwhelmingly complex reality."[12] The frame is usually selected without introspection, based on experience, research, and assumptions. Frames become the technique used to "organize the large-scale structure of inference making."[13]

Consider, for example, a product designer tasked with creating an innovative new toothbrush. This designer will have likely selected a frame similar to this:

11 Donald Schön, "Problems, Frames and Perspectives on Designing," *Design Studies* 5:3 (1984), 132–36.

12 Hideaki Takeda, Akira Tsumaya, and Tetsuo Tomiyama, "Synthesis Thought Processes in Design." Edited by H. Kals and F. van Houten. *Integration of Process Knowledge into Design Support Systems* (Kluwer Academic Publishers, 1999), 249–58.

13 Gary Klein, Brian Moon, and Robert Hoffman, "Making Sense of Sensemaking 2: A Macrocognitive Model," *Intelligent Systems* (IEEE) 21:5 (September/October 2006), 91.

An average person, in their bathroom, using a physical item with small bristles on the end to apply paste to their teeth; that individual will likely then produce friction with the physical item, the paste, and the teeth in order to eliminate food.

Note that this frame describes a person, a setting, and an action-based goal. It describes a very culturally-specific and archetypical example of teeth brushing.

The design method of *reframing* attempts to recast the above frame in a new perspective. Consider reframing the above example from the perspective of a different individual, rather than the non-descript "average person." The designer can purposefully view the problem from the perspective of a dentist, or a toothpaste manufacturer, or a child; the designer can shift cultural perspectives to think of an "average Indian" or "someone from Thailand"; the designer can reframe from the point of view of a person with no working limbs, or a group of people. The implications for designed artifacts are dramatically shifted each time the problem is reframed.

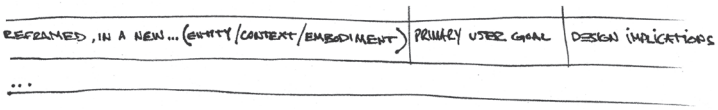
Thus, *reframing is a method of shifting semantic perspective in order to see things in a new way*. The new frame "re-embeds" a product, system, or service in a new (and not necessarily logical) context, allowing the designer to explore associations and hidden links to and from the center of focus.

From a methodical point of view, reframing can be achieved by following these steps:

Identify the initial frame. The toothbrush example provided above is purposefully over-simplified and overly analytical; a more realistic example might be in the design context of a complicated piece of enterprise software, intended to allow for pricing and configuration of parts. In this larger context, simply understanding and articulating an initial frame is difficult. For the purposes of this method, a design-specific frame can be described as: *An entity, in a context, using or considering a particular design embodiment*.

Again, the levels of specificity of the entity, context, and embodiment are dependent on the design problem being considered. It may be easy to very specifically define the frame of a "contained" design problem, while more complicated systems or services problems may require a more robust framing description.

Create blank reframing indices. Three charts will be used to structure the reframing exercises. The design opportunity will be reframed from the point of view of new entities, new contexts, and new embodiments (or new manifestations of the core artifact). Each chart will look like the example on the following page:



Reframe. The designer will begin to develop (through structured or casual brainstorming) new items for the left column of each chart. Depending on the desired level of innovation for the particular design problem, it is often desirable to include "provocations"—as deBono describes, these are ideas that may ultimately prove infeasible, but allow for "movement" across patterns.[14]

Extrapolate likely user goals. As the charts begin to become populated with new frames, the designer will begin to fill in the Primary User Goal for all items in all charts. They will paint a picture of a credible story, judging responses and adding criticism as appropriate.

Extrapolate design implications. The reframed design context will have produced new constraints or implications, or will have highlighted existing constraints and implications that may have been otherwise hidden or overlooked.

During synthesis, a designer can utilize the reframing method as described above to explicitly and fundamentally shift frames, changing the selected features and relationships and actively producing new design implications and constraints.

Method: Concept Mapping

A concept map is a graphical tool for organizing and representing knowledge. It "serves as a kind of template or scaffold to help to organize knowledge and to structure it, even though the structure must be built up piece by piece with small units of interacting concept and propositional frameworks."[15] Essentially, the map can be thought of as a picture of understanding.[16] A concept map is a formal representation of a mental model; a mental model "represents a possibility, or, to be precise, the structure and content of the model capture what is common to the different ways in which the possibilities could occur . . . when you are forced to try to hold in mind several models of possibilities, the task is difficult."[17] The concept map itself represents the creators' mental model of a concept, but it also informs and shapes that mental model during creation, as it allows designers to see both the holistic scale of the concept and also critical details within the concept. As it affords action-based understanding at both a gross and fine level, both its creation and its usage become tools for sensemaking.

Generally, a concept map links elements to one another. *Specifically*, a concept map will form connections between entities

14 Edward De Bono, "Serious Creativity," *The Journal for Quality and Participation* 18:5 (1995), 12.

15 JD Novak and AJ Cañas, "The Theory Underlying Concept Maps and How to Construct Them," *Technical Report IHMC CmapTools* (Florida Institute for Human and Machine Cognition, 2006).

16 Jon Kolko, "Information Architecture: Synthesis Techniques for the Muddy Middle of the Design Process." *23rd International Conference on the Beginning Design Student Proceedings* (Savannah, 2007).

17 Philip Johnson-Laird, "Mental Models, Sentential Reasoning, and Illusory Inferences." *Mental Models and the Mind*, 138 Part 1 (Amsterdam: Elsiver, 2006), edited by Carsten Held, Gottfried Vosgerau, and Markus Knauff.

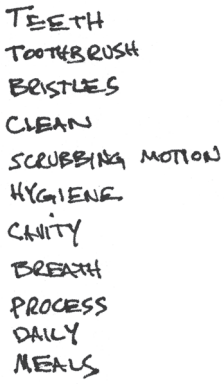


Figure 2 (above)
Raw taxonomy

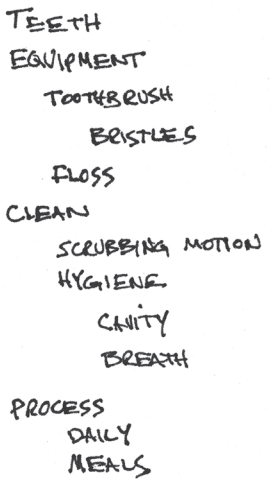


Figure 3 (above)
Prioritized taxonomy

(nouns) by describing relationships (verbs). The map provides a visual way to understand relationships through literal connections as well as through proximity, size, shape, and scale. As an artifact, the map is intended to illustrate relationships. As a methodology, the act of creation is generative and critical. The designer must make subjective value judgments in both selecting the items to include on the map and in indicating the relative strength of the relationships between items.

A concept map can be produced through the following steps:

Identification of core taxonomy. Both the noun and verb elements that describe the design problem or opportunity are listed on index cards. These elements include people, places, systems, artifacts, organizations, actions, processes, methods, and other entities and activities. To continue the oversimplified example of teeth brushing, a taxonomy may be identified as shown in Figure 2.

Prioritization of unique taxonomy elements. The index cards are rearranged in a way to indicate the hierarchy implicit in the taxonomy. Elements are deemed to be more or less important than one another, and are physically moved to illustrate this importance. Elements can be identified as being a subset (child) of a larger (parent) element, and are then physically indented to illustrate this relationship. New elements are added at this stage as appropriate.

Again, this prioritization is a subjective exercise that forces the designer to make value judgments about each item based on his or her understanding of the problem space, arguing for or against a particular placement. The taxonomy shown in Figure 2 may be prioritized as shown in Figure 3.

Creation of semantic connections between elements. The index cards now serve as the rough structure for the concept map. On a large sheet of paper, the designer begins to draw circles to illustrate the entities, and lines connecting the circles to one another in order to illustrate relationships between elements.

The map begins to create small sentence fragments of meaning, such as "teeth can become clean by using a scrubbing motion." This

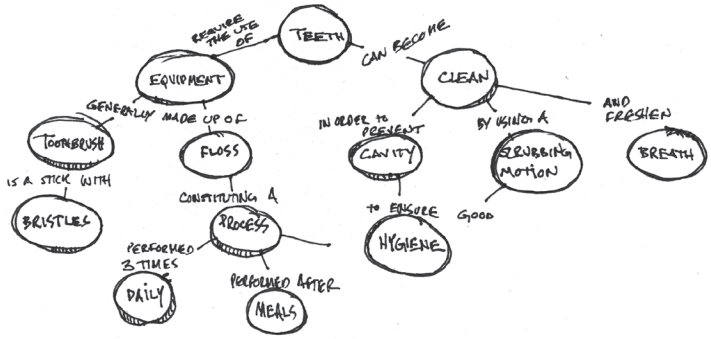


Figure 4 (right)
Concept Map

illustrates the generative and subtly abductive nature of the map, as the designer may have no deductive or inductive way of knowing that teeth can become clean by using a scrubbing motion.

During synthesis, a designer can utilize the Concept Mapping method (Figure 4, described on previous page) to organize and understand a topic, and to produce a model of that understanding.

Method: Insight Combination

Design patterns are "structural and behavioral features that improve the "habitability" of something."[18] Insight Combination is a method of building on these established design patterns in order to create initial design ideas. Through multiple steps, this method first demands the articulation of individual design insights, and then forces a structured and formal pairing of insights with existing patterns. This pairing creates a new design idea that has a strong connection to both established best practices and to problem-specific research data.

A design insight can be thought of as the additive of problem-specific observation ("I saw this") and personal and professional experience ("I know this"). This grounds an insight in both the subjective and general knowledge of the specific practitioner and in the objective data of the design problem itself. From a sensemaking perspective, this embraces the episodic and experiential uniqueness of the designer's memories, and pairs it with generally accepted ways of doing things.

By combining an insight with a design pattern, the designer is forced to examine and consider each unique insight. Methodically, the designer must think about each facet of the design problem that has been deemed useful or important. The method is then divergent, as it actively produces new ideas. Ideas are "moved forward" in a nonlinear fashion, jumping over the expected in order to arrive at the unexpected.

The method of Insight Combination can be conducted as follows:

Identify insights in the gathered data. The designer will begin to identify insights in the data that has been gathered by combining an observation (I saw this) with knowledge (I know this). They can then write the insights on yellow note cards. As an example, perhaps the designer observed someone brushing their teeth and noticed that the individual avoided using the mouthwash that was sitting next to the sink. The designer might recall his own last visit to the dentist. An insight could then be developed—that mouthwash has an implicit connection of taste and smell with going to the dentist, which taints the product in a negative light. Of course, this insight could be completely wrong, and that's perfectly acceptable.

Identify design patterns relevant to the core domain. The designer

18 Jennifer Tidwell, *Designing Interfaces: Patterns for Effective Interaction Design* (Sebastopol, CA: O'Reilly Media, Inc, 2005).

will now recall design patterns that are relevant to the discipline being studied. The patterns can be written on blue note cards. Some designers keep pattern libraries, noting trends and repeated design elements that appear in produced artifacts. Others prefer to search for patterns in the context of the problem. An example pattern that is loosely related to the toothbrush example might be the trend in consumer goods (kitchen soap, gum, etc.) to introduce new artificial flavors and smells like amaretto and butterscotch.

Perform an insight combination by pairing a design pattern with an insight and looking for affinities. Now, the designer begins to combine insights and design patterns to create design ideas by mingling the blue and yellow notes, moving them around physically and actively reflecting on potential combinations. When a combination makes sense and generates a design idea, the idea is written on a green note. Combining the insight (mouthwash has an implicit connection of taste and smell with going to the dentist, which taints the product in a negative light) and the pattern (the trend in consumer goods—kitchen soap, gum—to introduce new artificial flavors and smells like amaretto and butterscotch) yields a new design idea: produce a mouthwash that has a new flavor, one that doesn't have properties normally associated with the dentist's office.

During Synthesis, a designer can utilize the Insight Combination method as described above to directly apply personal experience in a manner that is tempered by design tendencies, and to actively produce new design implications and constraints.

Conclusion

This paper has defined design synthesis as an abductive sensemaking process of manipulating, organizing, pruning, and filtering data in the context of a design problem, in an effort to produce information and knowledge, and has introduced three methods of formalizing the synthesis process in practice. Each of the methods—reframing, concept mapping, and insight combination—emphasizes prioritizing, judging, and forging connections. These qualities are derived directly from the logical processes of abduction and the cognitive psychology theory of sensemaking.

When synthesis is "given its due," the results appear to be magical. By applying these methods in practice, by commonly and continually describing the role of synthesis, and by considering synthesis in Design Research, both practitioners and researchers can better realize how life experience drives design decisions, and how inferential leaps can systematically drive innovation.

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Photomontage for the Masses: The Soviet Periodical Press of the 1930s

Katerina Romanenko

Introduction

Cultural transformations taking place today in post-Soviet society consistently (re)turn scholarly attention to the 1930s—the historical period marked by the Soviet government's intention to bring "culture" closer to the barely literate majority of the Soviet population (mainly workers and peasants), with the goal of strengthening the political consciousness of the "masses."[1] However, the ways in which Soviet society interacted with the prescribed culture remain unclear. For a majority of the Soviet people, especially in the country's provinces, the periodical press (namely, newspapers, and magazines) was the main and, in some cases, the only agent of cultural information. Although intended for the ordinary Soviet population, mass periodicals reflected the diversity of artistic and cultural trends, and functioned not only as sources of information but also as visual media that transmitted, as well as created, the cultural norms of society.

The study of the periodical press remains a marginalized subject in art history, continually overlooked as aesthetically insubstantial to merit sustained attention.[2] Researchers focus mostly on the productions of major artists—caricaturists (Kukriniksi,[3] Konstantin Rotov, etc.); photographers (Maks Alpert, Alexander Rodchenko, Ivan Shagin, etc.), and poster designers (Gustav Klutsis)—and rarely address the sources through which their works and the works of other artists reached the population. Such disassociation misconstrues the contextual role of the images, since it implies an autonomous existence of the artwork. In reality, the majority of the images were consumed by the masses from the pages of the illustrated periodicals.[4]

At the same time, little attention has been given to the various practical issues involved in the production of the periodical press, namely the operation of the editorial office. Although the main feature of Soviet society was the single discourse defined by the government's official line, the final product derived, to a large extent, from the editorial staff's spontaneous interpretations of this line.[5] As Jeffrey Brooks put it, the mass media was the work of people struggling to "make the world around them intelligible within the officially given limits."[6]

1 In the 1930s, the term "culture" included personal hygiene, table manners, and propriety of language; as well as familiarity with art works and literature. See Vadim Volkov, "The Concept of 'Kul'turnost': Notes on the Stalinist Civilizing Process" in *Stalinism: New Directions*, ed. Sheila Fitzpatrick, (London/New York: Routledge, 2000).

Accordingly, the Soviet periodical press featured a great diversity of visual information. The quality, content, and media of the illustrations were extensively discussed in the professional literature of that time. While editorial theoretical and artistic preferences, and the ability to attract professional designers and artists, defined the visual character of the magazines, the quality of design and the illustrational content of these publications were equally subject to available technical equipment and financial budget. Analysis of the archival materials and published sources (literature for editors, illustrators, photo-reporters, and printing houses) indicate that, in addition to aesthetic concerns, editors also had to deal with pragmatic issues such as the printing capacity of available printing presses; the availability and quality of the visual material; reproduction permissions; censorship (and self-censorship); time constraints; and financial issues (from subscription rates to artists' fees).

This paper considers some of the practical issues affecting the visual content and design of Soviet periodicals published in the 1930s. Various types of illustrations that appeared in the press are reviewed in an attempt to explain why photomontage was the dominant graphic design element of the period. While the discussion concerns mass periodicals in general, the popular illustrated magazines *Rabotnitsa* (female-worker) and *Krestianka* (female-peasant) serve as case studies. Published beginning in the early 1920s, these two were the only women's periodicals that were continually published by the Party during the 1930s.[7]

Intended for general consumption, these publications provided representative examples of the period's graphic design conventions. At the same time, these magazines served explicitly defined segments of society—working and peasant women, respectively—thus offering a unique opportunity to witness the process of shaping a specific cultural paradigm.

Illustrated Magazines for Women

When the Soviet regime came to power, mass media became essential in its role of constructing the desires and values of the masses. It was one of the major channels through which the party influenced the people.[8] Historically, women were the most resistant to "sovietization," and were important targets of Soviet political and cultural propaganda since they were responsible for childcare and for creating the prescribed Soviet domestic environment. Their cooperation was necessary for the future of Soviet society and, thus, the women's press attracted special attention from Soviet officials. *Rabotnitsa* was the earliest magazine directed to working-class women. The first issue, which was composed entirely of text, appeared in 1914. The publication ceased to exist during the Civil War (1918–1921) and, in 1922, it reappeared as a popular political and cultural supplement to the *Rabochaia gazeta* (worker newspaper).[9] In 1922, *Krestianskaia*

2 The period of the 1930s in Soviet culture traditionally has been regarded as oppressive and incapable of producing anything innovative or aesthetically valuable. Since the 1980s, revisionist historians have attempted to elucidate the complexity of the Stalinism challenging the previous, yet still powerful, conception of the period as ideologically charged and aesthetically impotent. See *Cultural Revolution in Russia, 1928–1931*, Sheila Fitzpatrick, ed. (Bloomington: Indiana University Press, 1978). Existing studies of the Soviet periodical press deal predominantly with the literary or sociological aspects. See Jeffrey Brooks, "Socialist Realism in Pravda: Read All about It!" *Slavic Review* 53:4 (Winter 1994); Matthew Lenoe, *Closer to the Masses: Stalinist Culture, Social Revolution, and Soviet Newspapers* 95, Russian Research Center Studies (Cambridge: Harvard University Press, 2004); and Tatyana Dashkova, "Idealogia v litsah: formirovanie vizual'nogo kanona v sovetskih zhurnalkah 1920–1930x godov" ("Ideology in Faces: Formation of the Visual Canon in Soviet magazines 1920s–1930s") in *Vizual'naya Anthropologia* (*Visual Anthropology*) (Saratov: 2007). When considering mass periodicals, art historians have been predominantly attracted to the issues of the magazine *USSR in Construction*, designed by renowned artists Alexander Rodchenko and El. Lissitsky. See Erika Wolf, "USSR in Construction: From Avant-Garde to Socialist Realist Practice" (PhD Thesis, University of Michigan, 1999) and Victor Margolin, *The Struggle for Utopia: Rodchenko, Lissitsky, Moholy-Nagy, 1917–1946* (Chicago: University of Chicago Press, 1997).

3 This is a collective name derived from the combined names of three caricaturists: Mikhail Kupriyanov, Porfiri Krylov, and Nikolai Sokolov. They started drawing caricatures under the joint signature in 1924.

4 This also was pointed out by Sally Stein in "The Composite Photographic Image and the Composition of Consumer Ideology," *Art Journal* 41:1 (Spring 1981): 39 and note 2.

5 Brooks, "Socialist Realism in Pravda: Read All about It!," 75.

gazeta (peasant newspaper) also started to publish the illustrated supplement *Krestianka*, defined as a magazine for peasant women that was created to counterbalance *Rabotnitsa*'s appeal to women-workers. It should be noted that, although they were defined as women's magazines, *Rabotnitsa* and *Krestianka* were not exclusive in their readership. As one can judge from letters to the editors, they also served male members of the society, since husbands and brothers also were interested in topics covered by the magazines.[10]

As a means of mass persuasion, the periodical press was considered less important than newspapers. The Party devoted more funds to newspapers as the tool they considered to be more efficient in transmitting political information.[11] However, the magazines, published less frequently and in a "lighter" tone than the newspapers, were intended for the slower reading style of the "new readers," the majority of whom were national minorities peasants and women.[12] As a result, these publications acquired an especially important role in the cultural and political education of their readers. The significance of the women's press was emphasized by the 1927 party decree on press services for women that deliberated on the necessity to diversify the content of women's magazines according to the needs of the various groups. It specifically advised the women's press to "liven up its content and *design*" (my emphasis).[13]

A Picture Is Worth a Thousand Words

The proliferation of illustrations in the Soviet press should not be taken for granted. After the Civil War, the technical capacity of the Soviet printed media was practically destroyed, thus, in addition to the general cost and labor involved in the photomechanical process of reproduction, regaining the very ability to reproduce images required significant efforts.[14] By the late 1920s, the situation improved, yet 65 percent of the periodicals existed as daughter-companies of the main daily newspapers that provided them with technical means such as printing presses and polygraphic supplies.[15] In this way, *Rabotnitsa* and *Krestianka* depended on *Rabochaia gazeta* and *Krestianskaia gazeta*, the largest non-party daily newspapers in circulation.

Old printing machines, old-fashioned technology, and the lack of skilled workers were among the major reasons responsible for the poor visual quality of the periodical press.[16] Rotogravure and offset printing were the only technologically advanced processes enabling the print production of the huge number of copies required for mass circulation. *Pravda* and *Krestianskaia gazeta* had the most powerful printing capacities, and were among the few newspapers printed on offset machines.[17] *Pravda* was in possession of the only available rotogravure machine, and published the largest number of periodical supplements (a total of fourteen). Around 1929, it "swallowed" the printing plant earlier belonging to *Rabochaia gazeta*, and became the mother-company of *Rabotnitsa*. Yet, even *Pravda*'s publishing house

6 Ibid., 60.

7 After 1928, almost all other women's publications ceased to exist for political and economical reasons. Before that time, at least eighteen journals for women were published along with *Rabotnitsa* and *Krestianka*. Most of these periodicals were short-lived. Antony Buzek attributes this to the poor quality and a lack of clearly defined purpose of these magazines. (Antony Buzek, *How the Communist Press Works* (New York/London: Frederick A. Praeger, 1964). For example, *Zhenskii zhurnal* (*Women's Magazine*), published by the independent publishing association *Ogonyok* (Little Flame), struggled to compete with *Rabotnitsa*, which was financed by the State and distributed through the central party newspaper *Pravda* agencies. In spite of its popularity, the publication of *Zhenskii zhurnal* did not receive state support. Moreover, in 1929, the circulation of the magazine was restricted to 115,000 copies in spite of the *Ogonyok's* claim that the demand was much higher. At the end of 1928, *Pravda's* publishing house denied the use of its provincial branches for distribution of any periodicals except its own, thus preventing the proper distribution of competing publications. GARF. Fond 299, *Ogonyok* op. 1, ed. Khr. 2, list 34.

8 For the history of the Soviet mass media, see Mark Hopkins, *Mass Media in the Soviet Union* (New York: Pegasus, 1970). For recent research on Soviet cultural life, see V. Manin, *Iskusstvo v rezervazii: khudozhestvennaya zhizn Rossii 1917–1941* (*Art in Reservation: Artistic Life in Russia 1917–1941*) (Moscow: Editorial URSS, 1999).

9 From 1930s *Rabotnitsa* was published by *Pravda*. For more information on the early years of *Rabotnitsa*, see Natalia Tolstikova, "Reading Rabotnitsa: Ideas, Aspirations, and Consumption Choices for Soviet Women, 1914–1964" (PhD Thesis, University of Illinois at Urbana-Champaign, 2001).

10 See V. Vavilina, *Vsegda s vami: sbornik posvyashheny piatidisyatiletiiu zhurnala "Rabotnitsa"* (*Always with You: A Rabotnits's 50th Anniversary Collection*) (Moscow: Pravda, 1964).

had difficulties in satisfying the demand to produce its newspapers and magazines in a timely manner. A similar situation existed at *Krestianskaia gazeta*.[18] The quality of the reproduced illustrations depended on paper quality as well as paper and ink supplies that often were inadequate in relation to the technical requirements. Printers complained that printing supplies were not standardized, resulting in a discrepancy between expectations and results. Later in the decade, the situation improved with the purchase of new machines, yet tension continued to exist between editorial demands and printing press capacity.[19]

In spite of all the technical difficulties, the Soviet Union made significant efforts to develop its illustrated press. Soviet officials, among them Nadezhda Krupskaia, one of the founders of the Soviet system of public education, emphasized the importance of images in cultural education.

> For the present and for the near future, a peasant can learn to increase production only if he is taught by visual example. And, in general, the peasants, just like masses of workers, think much more in terms of images than in abstract formulas: thus visual illustration, even when a high level of literacy is reached, will always play a major role for the peasant.[20]

The progress of the Western illustrated press was noted and carefully followed. German, British, and American illustrated periodicals were discussed as valuable sources for appropriation, with proper ideological updates.[21] In their manual for newspaper professionals, Boris Vyazemskiy and Mikhail Urlaub discussed illustrations as the essential element of design and, while rejecting Western design theories, recycled most of the layout techniques used in various Western periodicals.[22] V. R. Kugel placed enormous importance on the press illustration, seeing in it an effective way to attract and educate the "new readers." For him, "it was impossible to deny an indisputable truth that a way of thought; the way of word to the millions of the new readers lays; in most cases, through the mass picture reproduced by modern advanced rotation printing."[23]

At the same time, Kugel lamented the reproduction quality of what was appearing in Soviet periodicals at that time, claiming that "only a poet would risk calling it an illustration."[24] In spite of the unflattering comments, the illustrations that were appearing in the magazines constituted the essential source of visual information for the Soviet people, and are an invaluable tool for researchers of 1930s visual culture.

Art for the Masses

Rabotnitsa and *Krestianka* featured a great variety of illustrative material. Reproductions of drawings, watercolors, lithographs, paintings, and many other types of images were constantly included in the

11 Following the consolidation of power in Stalin's hands in 1927, the press was extensively subsidized as the main mobilizer of the masses, and the number of the newspapers published grew dramatically. Simultaneously, many magazines and journals ceased to exist, yet the remaining publications, among them *Rabotnitsa* and *Krestianka*, saw an increase in circulation. Hopkins, *Mass Media in the Soviet Union*, 94.

12 See V. R. Kugel, *Ocherki izdatel'skogo dela* (*Essays on the Publishing Business*) (Moscow, Leningrad: Gos-Sots-Ekonomicheskoe iz-vo, 1931), 23. It should be noted, however, that although not published on a daily basis like the major newspapers, *Rabotnitsa* and *Krestianka*, on average, appeared two to three times a month. At some point, *Rabotnitsa* was published as a weekly. While anniversary issues typically were planned in advance, magazines also had to incorporate real-time material in a manner that often denied thoughtful and well-conceived design.

13 "Ozhivit' oformlenie (To Enliven the Design)," TSK KPSS, *Sovetskaia pechat v dokumentakh* (*Soviet Press in Documents*) (Moscow: Gos. iz-vo polit. lit-ry, 1961), 239–40.

14 Incorporating photomechanical reproduction within a text involved considerable cost and labor. For the fine quality of the illustrations, the images had to be printed through the process of the halftone reproduction technique on expensive, coated stock; separately from the conventional rough stock used for the letterpress printing of the text. For illustrations to appear beside the relevant text, images had to be cut separately, set in, and glued to the binding edges of the adjacent pages. See Stein, "The Composite Photographic Image and the Composition of Consumer Ideology," 43.

15 V. R. Kugel, *Ocherki izdatel'skogo dela* (*Essays on the Publishing Business*), 23.

16 Ibid., 30–33.

17 *Rabotnitsa* was printed by rotogravure machines, yet Kugel criticized the quality of *Rabotnitsa's* reproductions, claiming that, for this magazine, offset printing would be as good, while for *Ogonyok*, which at that time was printed in offset, rotogravure was better. Ibid., 152, 154.

magazines. After the restoration of photomechanical reproduction capacities in 1923, not a single issue of *Rabotnitsa* and *Krestianka* was published without photographs.

In most cases, images appeared as illustrations to the text; yet artwork also was published independently with separate captions. Special efforts were made to include color reproductions. Occasionally, magazines featured exhibition reviews and articles about museums and artists. Professional artists were often invited to submit illustrations and caricatures, fashion patterns, and embroidery designs.[25] Graphic illustrations and reproductions of paintings were important elements of the publications and, in most cases, artists' names were carefully acknowledged. In contrast, magazine designers were practically never mentioned.

As in Western countries, publication of artistic works in the Soviet Union required reproduction permission from the artist or the institution possessing the copyright. When a magazine wished to commission an illustration, it was required to pay about fifty rubles for a small drawing to be used within the text, and three hundred rubles for a front cover illustration (established artists, or the so-called the IIIrd category, were paid four times more for the same work).[26] As a result, graphic images usually were restricted to the illustration of serial novels and short stories. Editors also used secondary sources and recycled images appearing in history books or the central newspapers. This was a typical practice for illustrations of historical subjects, for example the history of the Paris Commune or of the Civil War.

No Painter Is Able to Depict on Canvas What the Camera Sees

Compared to the difficulties involved in the publication of works of fine art, photographs were easier and less expensive to acquire. Photographers' rates were much lower than those of painters, ranging from ten to fifteen rubles for specially commissioned images and even less for stock photography. Large periodicals hired their own photo-reporters on a full-time salary.[27] *Soyuz-photo* (Union-Photo) agency and the amateur photographer movement supplied a wide range of images on every possible theme.[28] Several courses and guidebooks advised the local photo-correspondents on a variety of topics, from composition and selection of the theme to submission guidelines.

The most popular subjects, especially portraits of Party leaders and famous people (prominent shock-workers, aviation heroes, scientists, stakhanovits, etc.), were even sold in the form of *clichés* (a printing plate cast), ready for printing.[29] The price ranged from four to twelve rubles per image, depending on size and quality.[30] In 1937, for example, the Press-Cliché agency planned the publication of the thematically arranged collections of images covering "subjects of the All-Union significance, foreign chronicle,

18 Government's organs *Izvestiia* and *Gudok* had similar printing capacities. Ibid., 34.

19 Ibid., 146. Editorial archives and discussions held in *Zhurnalist* (*Journalist*), *Polygraphicheskoe delo* (*Polygraphy Business*), *Sovetskaia pechat* (*Soviet Press*), etc. reveal a continuous exchange between editors and printing houses, blaming each other for the poor quality of the publications.

20 Cited in Victoria E. Bonnell, "Iconography of Power: Soviet Political Posters under Lenin and Stalin" 27, *Studies on the History of Society and Culture* (Berkeley and Los Angeles: University of California Press, 1997), 4. A prominent member of the Communist party, Nadezhda Krupskaia, is known as Vladimir Lenin's wife and co-worker. She held several positions in the Department of Education, and was a leading pioneer of early Soviet cultural transformation. See Christopher Read, "*Krupskaia, Proletkul't* and *the Origins of Soviet Cultural Policy," International Journal of Cultural Policy* (November 2006): 12, 3, 245–255.

21 Kugel; S. N. Sredninskiy, *Razbor nekotorykh teoriy po oformleniyu gazety, knigi* (*Discussion of Some Theories of a Newspaper and Book Design*), Izvestiia pedfaka (Baku: Azerbadzhan State University, 1929).

22 B. A. Vyazemskiy and M. K. Urlaub, *Tekhnicheskoe oformleniie gazety* (*Technical Design of a Newspaper*), ed. Communist Institute of Journalism in the name of V. V. Vorovsky (Moscow/Leningrad: Gos. izdatelstvo legkoy promyshlennosti, 1933).

23 "нельзя отрицать непреложной истины, что путь мысли путь слова к многомиллионному новому читателю лежит, в большинстве случаев через массовую картинку, воспроизводимую современной усовершенствованной ротацией." V. R. Kugel, *Ocherki izdatel'skogo dela* (*Essays on the Publishing Business*), 143 (my translation).

24 Ibid., 144.

and caricature."[31] In short, the affordability and availability of the photographs and ready-made *clichés* for reproduction purposes buttressed the editorial preference for photography as a main visual medium.

A preference for photography also was dictated by the period's theoretical discussions. During the 1930s, Soviet periodicals were at the center of the dispute between illustrators and photographers over the superiority of their respective media in Soviet art. In the 1930s Soviet photographers were still burdened with an inferiority complex vis-à-vis painting.[32] The ability of graphic artists to capture the essence of a moment with just a few lines contrasted with photographers' dependence on the mechanical indifference of the camera, which slavishly captured everything in view without regard to the importance of details.[33] Nevertheless, photography has been seen historically as a medium of truth and accuracy, and has been accepted as a universal means of communication. In the 1930s, photography's ability to illustrate/document immediate reality was unquestionable; while Lenin's statement that "no painter is able to depict on canvas what the camera sees" ultimately legitimized the photographer's claim to dominance.[34]

With this observation it should be noted that, throughout the 1930s, professional literature for editors continued to stress the importance of photography and graphics, and reiterated the meaninglessness of the media competition in graphic design since photographer and artist performed complementary though different tasks.[35] In addition to theoretical and aesthetic considerations, there were technical reasons for such a union. Ironically, the publication of photographs required the work of an artist-retoucher. In the end, the visual quality of the reproduced images often merged both media—photography and graphics—into an indivisible alliance. Often a photograph would be used as a foundation for an illustration that would look like a line-drawing (*shtrikhovoy risunok*). This usually would occur when the quality of the photographs intended for reproduction or the quality of the paper was extremely poor.[36] The result was a hybrid image simultaneously bearing the imprint of the artist's hand and the mechanical eye.

A Way to Combine a Number of Photographs

In the midst of the rivalry between painting and photography, photomontage offered a means for the ultimate manifestation of the "photo-graphic" unity, since it incorporated both the documentary power of photography and the illusionism of painting and drawing. When the call for truthful, direct, and comprehensible imagery initiated by more traditional artists was enthusiastically supported by the masses and promoted by the government, photomontage provided avant-garde artists with a way of showing reality without returning to painterly realism.[37]

25 Zinaida Rakitina, an artist-sculptor and probably the never-credited staff designer of *Rabotnista*, introduced color into design and invited contributions from famous artists. At some point, Boris Ioganson, Juliy Ganf, and Konstantine Rotov provided caricatures for both magazines. This information appeared in the collection of the memoirs of the *Rabotnitsa* staff workers that were published on the occasion of the fiftieth anniversary of the magazine. Vavilina, *Vsegda s vami: sbornik posvyashheny piatidisyatiletiiu zhurnala "Rabotnitsa,"* 224.

26 RGALI, Komitet po delam iskusstv (Art Committee), Fond 962, Stenogramma soveshchaniya po ustanovke tarifov na izo-raboty (A transcript of the meeting for establishing payment tariffs for visual-works), (1937); ed. khr.6, opis 193, list 2–8. Such prices put these artists out of the price range for most publications.

27 In 1936, *Ogonyok's* photo-reporter received 400 rub (with the norm of 100 original photos per month; plus commissions for special orders (10–20 rub. Fifty percent for urgency); salary of the assistant – 300 rub (300 reproductions) and salary of the designer – 500 rub. For example, a worker in a printing house received 150–250 rub; GARF, Soveshhanie v upr avlenii Tresta Polygraphii (Meeting at the executive office of the Polygraphy Trust). 10/26/1936, ed. Khr. p-4851, opis 5, list 19.

28 *Soyuz-Photo* was an All-Union photographic agency responsible for centralized production of photographic materials for newspapers, periodical press, publishing houses and other consumers of photographic images. It was also engaged in organizing the photo-amateurs into the photo-correspondent movement.

29 A cliché or "a stereotype" is a term historically used in printing for a printing plate cast from movable type or a combination of images and type.

The history of Soviet photomontage dates to the early 1920s. Gustav Klutsis is traditionally regarded as the emissary of the political use of photomontage; while Alexander Rodchenko's illustrations for Vladimir Mayakovskiy's poem *Pro Eto* (*About This*) (1923) exemplify the earliest use of photomontage in book design. In 1922, *Kino-Fot* magazine initiated public discussion of photomontage.[38] In the early stages, the discussion addressed the formal aspects of the method and, while acknowledging Dada's photomontages as a precedent, dwelled on the differences in approach.[39] In 1924, *LEF* magazine published an anonymous text entitled "Photomontage" that underscored the documentary and agitational function of the method.[40] In the early 1920s, during the New Economic Policy (NEP), photomontage was used predominantly for book and advertisement design. Yet in the late 1920s and early 1930s, an extended debate concerning photomontage's potential as "a good weapon of propaganda and agitation" was revived.[41] With growing attacks on formal experimentation, former "constructivists" had to find proper justification for their formalist ideas and prove the relevancy of photomontage to Soviet society. Eventually, the privileging of social content over formal experimentation prevailed, corresponding to the general shift of preferences in Soviet visual arts.

In contemporary scholarship, this change was interpreted as an abandonment of avant-garde principals under the pressure of Stalin's regime, leading to the disregard of the continuous use of photomontage in the 1930s.[42] Scholars who discuss the late Soviet photomontage focus mostly on the production of major artists such as Gustav Klutsis, Alexander Rodchenko, and El Lissitsky. All these artists contributed to the periodical press, yet the publication context in which their works often appeared is rarely addressed.[43]

The continuous use of photomontage in the periodical press of the 1930s cannot be explained by looking at the avant-garde alone. It is well known that photomontage as a method of arranging images has been used since the invention of photography in the nineteenth century. In the early twentieth century, Soviet and Western artists were directly stimulated by advertisements and film.[44] While the avant-garde artists' were interested in formulating the theoretical implications of photomontage, for editors and graphic designers photomontage itself was primarily a way "to combine on the same visual surface a number of various photographs unified by the same content and specific compositional arrangement."[45] It was also a way to compensate for poor technical resources and the lack of professional designers. In other words, photomontage was an indispensable technical tool that enabled the organization of the visual content of magazines in a dynamic, yet also concise and economic manner. Many authors of that time acknowledged the usefulness of this method in spite of the technical difficulties and extensive labor it often involved.

30 For a one-column line-drawing – 4 rubles; tonal – 6 rubles; for a two-column line-drawing – 8 rubles, tonal – twelve rubles. For orders of more than 10 clichés – free shipping. Processing took fifteen days from the day the order was received. Agency Press-Cliché Soyuz-photo, *Obraztsy klishe-portretov vypushchenykh press-cliché Soyuz-photo dlya rayonyh polit-otdelov i fabrichno-zavodskih gazet* (Samples of cliché-portraits produced by Press-Cliché for the regional political departments and newspapers on the factories and plants) (Moscow: Press-Cliché Soyuz-photo, 1937).

31 Ibid. *i* criticized the periodical press for not employing this option and, as a result, publishing poor quality portraits. It was known that Press Cliché often supplied poor quality illustrations to the provincial newspapers. ("Prodolzhenie diskussii po pismu Izgoyeva,) ("Continuing the Discussion Regarding Izgoev's letter"), *Zhurnalist* 7 (1929). This supports the conclusion that the central press reproduced images in the best available quality.

32 See KomAkademiia, *Voprosy razvitiia proletarskogo iskusstva: materialy diskussii* (*Issues in the Development of the Proletarian Art: Materials of the Discussion*) (Moscow: Izd-vo Kommunisticheskoi akademii, 1931), 13–31.

33 B. M. Kisin, *Grafika v oformlenii knigi* (*Graphic Arts in Book Design*) (Moscow: Gizlprom, 1938), 206.

34 Cited in Sergei Morozov and Valerie Lloyd, *Soviet Photography: An Age of Realism* (New York: Greenwich House, 1984), 8.

35 B. M. Kisin, *Grafika v oformlenii knigi* (*Graphic Arts in Book Design*), 203–6.

36 D. B., "Fotografiia na sluzhbe u grafiki" ("Photography on Service of the Graphic Arts"), *Sovetskoe foto* (*Soviet Photo*) 5 (1935): 38.

Figure 1
"Long live to the world October. 19 years of October," *Krestianka*, 20, 1929, pp. 8–9

Figure 2
"Women's Equality," *Krestianka*, 34–35, 1932, p. 8

Analysis of the photomontages appearing in mass periodicals clearly indicates the prioritization of this method for its capacity to condense time and space. Among the topics most often entrusted to photomontagists were the themes of: the transformation from past to present (*tak bylo-tak est'*); the juxtaposition of the Soviet way of living with the capitalist experience (*u nas-u nih*); and the presentation of events taking place simultaneously in different parts of the country (*po strane*). These were extremely important subjects in Soviet iconography. General themes glorifying the advantages of Soviet life (industrialization, motherhood, childhood, etc.) featured construction sites, the conquest of the North Pole, parades, state festivals, even congresses and political meetings often were treated in terms of such juxtapositions.

In contemporary discourse, montage method is typically associated with photography or a combination of "photo" and "graphic" elements. It should be noted that in the 1930s, the montage produced by drawing alone also was acceptable and welcomed by the authors of some graphic design manuals as an efficient method of illustration (Figure 1).[46] Indeed, occasionally periodicals featured drawings that looked like montage. Even without the documentary quality provided by photography, montage-drawing preserved the capacity to present various aspects of the same event in a condensed yet digestible manner.

The simplest photomontage presented the arrangement of a number of images unified by one subject and combined in one cliché. For example, "Speech of an orator and general view of the meeting"[47] (Figure2). The same method was used to combine parts from separate images into one image "when the quality of some areas of a photographed material appeared better in different photographs taken from the same point,"[48] or when some details were undesirable. Complex photomontage involved the meticulous gluing of parts, although the joining lines had to be hidden to avoid their appearance in the published image.[49] More demanding instructions required the use of photographs with identical qualities. For example, the combination of black-and-white with sepia photographs was unacceptable, as was the use of photo-prints together with clips from magazines or books (although the use of such secondary sources was encouraged).[50] Yet, it is clear that magazine creators often had no choice but to use a variety of sources. Very often, images appearing in special publications would be republished in the mass-market magazines. Images from the luxurious photo-illustrated magazine (*USSR in Construction*), for instance, occasionally reappear in *Krestianka* and *Rabotnitsa*. When such recycling occurs, the original source often is acknowledged, but credit information is not consistently supplied.

The montage method frequently was applied to groups of portraits. It was most helpful in the presentation of numerous everyday heroes—Stakhanovites, delegates, pilots, and so forth.

Figure 3
"Growing stakhanovites movement,"
Krestianka, 26, 1936, pp. 8–9

Figure 4
Krestianka, 15, 1933, Cover

Consideration of space rather than aesthetic concerns, often conditioned the placing of the portraits "shoulder to shoulder."[51] Such arrangements of portraits were welcomed, since it allowed the inclusion of multiple visual facts without sacrificing much space in the issue. (One of the manuals explained that each portrait may take 25–30 lines in a page layout; while two portraits combined in montage would only take up 30–50 lines.[52]) Combined portraits were glued together and sent to production as one image.[53] It was a space-saving as well as visually appealing and dynamic way to deal with otherwise repetitive and often boring images. Throughout the decade, the assembly of portraits often took quite elaborate forms, as in the montage "Growing *stakhanovites* movement," in which each prominent *stakhanovite* is shown next to his field of work (Figure 3). Similarly complex is the frequent cover montage with multiple portraits of the political or new working-class elite (Figure 4).

Complex montages often combined graphic and photographic media. Such photomontages required specific artistic training, and often were the product of both artist and photographer.[54] It was important that the proportions of the individual portraits and their lighting corresponded: contemporaries noted that, when the portraits were photographed under different lighting conditions, the resulting montage had an unnatural appearance; looking "motley" and "artificial."[55] Still, no one expected to see reproductions of ideal photomontages in mass periodicals. Most crudely visually assembled montages could be smoothed out by an experienced retoucher. It is interesting to note that periodicals occasionally would mention the name of the photomontage artist. In most cases, however, if any credit line was provided, it would be the photographer's or illustrator's, thus underscoring the difference between high (painting, drawing, and certain types of photography) and low (graphic design) art forms.

Serving the Masses

The huge educational and ideological potential of the illustration was clearly realized by Soviet press professionals as well as by the government. The magazines' choice of visual media and methods of design was crucial for the interpretation of the new Soviet culture, and contributed to the process of shaping Soviet mass consciousness. While magazine design relied on all forms of illustration, photography possessed a number of advantages as a cheap and relatively easily reproduced medium. The poor quality and technical limitations of photographic images were compensated for by the skills of the artist-retoucher, by the addition of text, and by the photomontage. Parallel to, and often independently from, the avant-garde employment of the medium, photomontage was an important technical tool in the graphic design of the periodical press. Following the Socialist Realist doctrine's insistence on highlighting a celebratory mood in every aspect of socialist construction, editors consis-

tently relied on the photomontage artist's ability to condense and heighten the emotional impact of images. Throughout the 1930s, magazines published different forms of photo spreads, from very simple combinations of images to compositionally and conceptually complex montages. Based on the analysis of the photomontages appearing in Soviet periodicals in the 1930s and from the literature of that time, it can be concluded that; while photomontage was affected by changes in the social environment, censorship, and the development of Socialist Realism; the medium was equally subjected to many, often pragmatic, editorial concerns. One way or another, throughout the 1930s, photomontage was truly utilized in the service of the masses.

37 By 1923, realism and easel painting recovered its position as a dominant visual style. Avant-garde artists moved into graphic design in the early 1920s. Before that, they were preoccupied with formal experiments in objectless representation. This move was prompted by the changes in state politics concerning the arts, and was paralleled by changes in the art world itself. Among the reasons for the artists' move into graphic design was their desire to stay connected with mass culture, and to contribute to the new society in which they strongly believed. It would be wrong to see politics as the only factor for such change. Many artists felt limited by the avant-garde emphasis on nonrepresentational form, and looked for a wider form of expression. Constructivist artists favored the technical aspect of the new technique and the fact that the photograph was used by the artist as an event itself, caught in its true essence and not as a reproduction of the event. Leonid Volkov-Lannit, *Aleksandr Rodchenko risuet, fotografiruet, sporit* (*Alexander Rodchenko draws, photographs, argues*) (Moskva, Iskusstvo, 1969), 55.

38 For a discussion of *Kino-Fot*, see Christina Lodder, "Promoting Constructivism: *Kino-Fot* and Rodchenko's Move into Photography," *History of Photography* 24:4 (Winter 2000). Also see Kristin Romberg, "From Veshch to SA: Journal as Object" in *Architecture in Print: Design and Debate in the Soviet Union 1919–1935* (New York: Columbia University, 2005).

39 Dada started photomontage experiments in 1919.

40 "Photomontage," *Lef* 4 (1924). The text most likely was written by Osip Brik. For a discussion of the authorship, see Natasha Kurchanova, "Against Utopia: Osip Brik and Genesis of Productivism" (PhD Thesis, City University of New York, 2005).

41 Cited in Margarita Tupitsyn, "From Politics of Montage to the Montage of Politics: Soviet Practice 1919 through 1937" in *Montage and Modern Life* (1992), 91–92. Also see F. Konnonov and Y. Tsirrelson, "Vystavka Oktyabrya" ("Exhibition of October"), *Iskusstvo v massy* (*Art into Masses*) 7:15 (July 1930).

42 Because of the prevailing assessment of the 1930s period as artistically the most unproductive and barren in Soviet cultural history, art historians rarely look beyond 1934, when all independent cultural organizations were dissolved and the attacks on formalism discouraged any formal experimentation. Benjamin Buchloh established the photomontage's move from "faktura" to "faktography" that took place around 1934. See Benjamin Buchloh, "From Faktura to Factography," (October 30, 1984). Yet, unlike "faktura" montage, factographic photomontage is still an understudied subject in general, and in art history specifically.

43 This also was noted by Erika Wolf in her article, "When Photographs Speak, to Whom Do They Talk? The Origins and Audience of *SSSR na stroike* (USSR in Construction)," *Left History* 6:2 (2000): 53–82.
For an example of the situation when such de-contextualization leads to partial and even incorrect interpretation, see Margarita Tupitsyn, *The Soviet Photograph, 1924–1937* (New Haven: Yale University Press, 1996), note 35.

44 After 1917, the illustrated magazines in Russia were practically extinct but, by 1920, at the end of blockade of the Civil War, the foreign journals *Die Dame, Junge Welt, Moderne Illustrierte Zeitschrift, and Die Woche* were sold in Moscow or brought by travelers from abroad. Alexander Lavrentiev, "About This Book" in V. Mayakovski, *Pro Eto* (1923) (Berlin: Ars Nicolai, 1994), 7.

45 Vyazemskiy and Urlaub, *Tekhnicheskoe oformleniie gazety*, 174. Also see B. M. Kisin, *Grafika v oformlenii knigi* (*Graphic Arts in Book Design*), 206.

46 Ibid., 174–77.

47 Ibid., 174.

48 Sergey Morozov, *Fotoillustratsiia v gazete. V pomoshch redaktsionnym rabotnikam* (*Photo-illustration in Newspaper: Helping Publishers*) (Moscow: Goskinoizdat, 1939), 106.

49 Ibid., 105.

50 B. M. Kisin, *Grafika v oformlenii knigi* (*Graphic Arts in Book Design*), 207.

51 Sergey Morozov, *Fotoillustratsiia v gazete. V pomoshch redaktsionnym rabotnikam*, 108.

52 Vyazemskiy and Urlaub, *Tekhnicheskoe oformleniie gazety*, 174.

53 Zincography, the process of engraving zinc printing plates, was the most typical process of image reproduction.

54 Sergey Morozov, *Fotoillustratsiia v gazete. V pomoshch redaktsionnym rabotnikam*, 108.

55 Ibid.

Evaluating Aesthetics in Design: A Phenomenological Approach

Mads Nygaard Folkmann

Introduction

Discussing aesthetics as an aspect of design touches upon one of the most vital matters of how design functions as a means of communication. Especially in non-professional contexts, when design artifacts are noticed and appreciated, it is more often for their *aesthetic* qualities than their practical or functional ability to solve more or less complex or well-defined problems. Furthermore, working with aesthetics is often regarded as a core competence in design, and the pervasive attention paid to aesthetics can be annoying to designers, as it implies that they work solely with artistic matters of surface, appearance, and styling as opposed to, for example, functionality. Paradoxically, aesthetics in design has been a neglected area of research, even though there has been some attention given to understanding the aesthetic qualities of the non-functional, "emotional" factors in design.[1] Attempts to establish a scientific discourse for design have instead placed emphasis on analyzing and prescribing the *methodology* in designing (as in the practice-based framework of Design Methods);[2] or the impact of *culture* and social processes on the making and consumption of design (as in studies of design history and the material culture of design, where matters of aesthetics are often consciously set aside due to an ideological struggle with the pervading notion of "good design" and its prescriptive aesthetics of outer beauty leading to moral improvement);[3] or the issue of *meaning* in design—that is, how "form follows meaning"—and how design, on a semantic basis, makes sense in different contexts (e.g. contexts of use, language, life cycle, and ecology).[4] All of these positions have more or less left out any analytical consideration of aesthetics. However, raising the issue of aesthetics in design is crucial, and not doing so leads to diffuse and sometimes unqualified discussions.

In this article, I will attempt to establish a conceptual framework for discussing, theorizing, analyzing, and practically addressing aesthetics in design. I point mainly to the theory of phenomenology but also touch upon various aspects of the tradition of aesthetic theory in European philosophy. My aim is, however, not to use a philosophical, conceptual discourse to establish the "true" meaning of the word "aesthetic" to define it once and for all. Due to the heterogeneity of the concept, this would be an impossible task. The history of the concept itself has led in many directions—it was coined

1 To the discussion of emotion in design, see the groundbreaking works by Donald A. Norman, *Emotional Design* (New York: Basic Books, 2004) and Patrick Jordan, *Designing Pleasurable Products* (London: Taylor & Francis, 2000).

2 In the line from John C. Jones and Peter Slann's seminal 1962 conference on "Systematic and Intuitive Methods in Engineering, Industrial Design, Architecture and Communications" to e.g. Donald A. Schön, *The Reflective Practitioner* (London: Temple Smith, 1983), Bryan Lawson, *How Designers Think* (Oxford: Architectural Press, 1980/2005) and Nigel Cross, *Designerly Ways of Knowing* (London: Springer Verlag, 2006).

3 See Adrian Forty, *Objects of Desire* (London: Thames and Hudson, 1986/2005); Judy Attfield, *Wild Things* (Oxford: Berg, 2000). The connection in the ideology of "good design" of beauty and moral is itself a classical notion that can be traced back to the Sentimentalist discourse of the eighteenth century.

4 See Klaus Krippendorff: "On the Essential Contexts of Artifacts or on the Proposition that 'Design is Making Sense (of Things)'," in *The Idea of Design*, R. Buchanan and V. Margolin, eds. (London: MIT Press, 1995), 156–184, and *The Semantic Turn. A New Foundation for Design* (Boca Raton: Taylor & Francis, 2006).

by Alexander Baumgarten in *Aesthetica* (1750–58) to describe a philosophical discipline that investigates the "lower" sensual aspects of human experience as opposed to the higher realm of logics. This led to the debate on taste and value judgment of beauty and the sublime in Kant's seminal *Kritik der Urtheilskraft* (1790), which preceded the close link between the work of art and the philosophy of aesthetics from Schelling's Romantic-idealistic celebration of the work of art in *Philosophie der Kunst* (1802) to Adorno's Modern-critical investigations of the communicative means and utopian potential of art in *Ästhetische Theorie* (1970).[5]

Instead, my aim is to point to some of the directions that a contemporary *design aesthetics* may take if it is serious about being an aesthetics specific to design and not to art, the classic topic of Romantic and Modern aesthetic theory. Hence, my path to a new understanding of aesthetics in design will not go through the traditional discussions of art as a medium of aesthetic appreciation and communication, as this risks reducing design to a matter and medium of artistic aspiration. Of course, a design object can be the result of purely artistic and autonomous self-expression, but it often has a wider context. In relation to design methodology, it will be more justified to speak of design as a meeting point of multiple interests (those of a client, designer, and manufacturer) and as a complex negotiation between "problem formulation" and "solution generation."[6] From a point of view of cultural analysis, design is a practice of innovation and change, not to be separated from the culturally circumscribed patterns of consumption. Further, an appropriation of design by the aesthetics of art, implying a view of design as art, may hamper an understanding of the unique complexity of almost every design object or solution: that design is not the expression of a lone artist, but the result of commercial and societal processes[7] and, at best, of an ambition to grasp the potential power of giving shape to our environments in innovative and progressive ways that are appropriate to human needs.

Still, however, one should not neglect issues of aesthetics in design, if only because designed objects contribute to the ongoing aesthetization of everyday life that is so prevalent in late Modernism. Aesthetics is no longer the exclusive domain of art but applies to our immediate, sensuous experience of the world. To demonstrate my points, I will examine two examples, both of Danish provenance: interior designs by Verner Panton from the 1960s and various designs of round chairs from the past ten years by designer Louise Campbell.

Form and Sensuous Experience

Evaluating aesthetics in design is mainly a matter of grasping its sensuous qualities, or, rather, design's distinctive appeals to the senses. This does not mean that assessing aesthetic qualities in design exhausts all the different properties that design encompasses (for

5 In *Ästhetische Theorie*, Adorno precisely locates the beginning of the collaboration of art and aesthetics in the philosophy of Schelling: "Ever since Schelling, whose aesthetics is called a philosophy of art, has the aesthetic interest been concentrated on works of art" (Frankfurt a.M.: Suhrkamp, 1970), 97.

6 See Cross, op. cit., 77–93, and Lawson, op. cit. 112–26.

7 As clearly stated by Forty who argues strongly against regarding design as works of art; op. cit., 7.

example, functionality and sustainability).[8] But it does emphasize the function of design objects as sensually appealing artifacts as well as issues concerning form and surface. My dual purpose here is to explore how form and appearance can be qualified as means of a type of aesthetic communication that challenges experience, and to discuss the role of form as a challenge to our understanding of things.

These issues of form, experience, and understanding in design can be situated within two powerful frameworks. First of all, in recent years there has been a tendency to try to loosen the connection between art and aesthetic theory, and, to revisit Baumgarten's original idea of applying aesthetics to sensual matter (in Old Greek, *aisthetá*, "that which can be sensed"). This movement from works of art to general sensuous experience and, further, to questions concerning how reality is arranged and perceived aesthetically, is the topic of a new era of aesthetic theory that has been unfolding since the 1990s in works by philosophers Richard Schusterman,[9] Martin Seel,[10] and Gernot Böhme.[11] Tellingly, the title of one of Böhme's recent works features the Greek root of the word aesthetics: *Aisthetik. Lectures on aesthetics as a common doctrine of perception*.

Second, this bias of recent aesthetic theory can be seen in the contextualization of phenomenology as a philosophy that addresses the fundamental premise of the importance of experience and the basic conditions of experience. The term "phenomenology" was coined by the philosopher Edmund Husserl based on Old Greek etymology as the doctrine (*logos*) of that which shows itself (*phainomenon*). The point is that phenomenology, as a theory of experience, can address certain aspects of aesthetics related to sensuous appearance and experience. In the following, I will use the theory of the French phenomenologist Maurice Merleau-Ponty to discuss various modes of sensual qualities in design. In an important essay, "L'entrelacs—Le chiasme,"[12] Merleau-Ponty introduces two kinds of interlaced structures in experience to which I will refer in the following discussion of two important aspects of aesthetics in design.

1. An Aesthetics of Sensual Relation

Merleau-Ponty's first structure takes its departure in immediate and concrete experience. Here, Merleau-Ponty follows a basic assumption in phenomenology: That experience is a matter for a concrete and specific subject whose consciousness is incarnated in a body that is located in a concrete world of things and intersubjective relations. Reversely, the "world" is only ever a matter for a bodily incarnated subject. For Merleau-Ponty, the consequences are radical in the sense that it is impossible to separate the experiencing subject from the experienced world; subject and object are reciprocally intertwined; the sensing subject cannot be separated from the sensed material, and the viewer cannot be separated from the viewed but participates

8 See Morten Kyndrup: "Aesthetics and border lines: 'design' as a liminal case," <http://www.aestetik.au.dk/gr/papers/morten_kyndrup>, 9. (accessed 10/2009).

9 *Pragmatist Aesthetics: Living Beauty, Rethinking Art* (Oxford: Blackwell, 1992).

10 *Ästhetik des Erscheinens* (München: Hanser, 2000); *Die Macht des Erscheinens* (Frankfurt a.M.: Suhrkamp, 2007).

11 *Atmosphäre. Essays zur neuen Ästhetik* (Frankfurt a.M.: Suhrkamp, 1995); *Aisthetik. Vorlesungen über Ästhetik als allgemeine Wahrnehmungslehre* (München: Wilhelm Fink Verlag, 2001).

12 Maurice Merleau-Ponty, *Le visible et l'invisible* (Éditions Gallimard: Paris, 1964), 170–201.

in it and is influenced by it. Likewise the sensing or viewing subject can herself be sensed or viewed and thereby become an object. In this way, Merleau-Ponty criticizes the traditional dichotomy of subject and object. Further, in a sort of deconstructive gesture he attempts to reverse the dichotomy in order to show that it has a common foundation in a figure of continuity that he calls the *flesh*, "la chair." He speaks of density of the flesh ("l'epaisseur de chair") as a means of communication between the viewer and the thing. Similarly, the body is located in a chiastic structure with the world: "The body participates in the order of things and likewise the world is universal flesh."[13] Experience, in Merleau-Ponty's phenomenology, is an ongoing exchange between subject and object that takes place in the common material of "chair."

Almost as an explication of Merleau-Ponty's notion of "chair," the German philosopher Gernot Böhme has developed a powerful concept of ambience, *Atmosphäre*, to analyze how things, situations, and surroundings appeal to us. Or, rather, Böhme likewise deconstructs the dichotomy of subject and object, defining ambience as a kind of relation between subject and object. The point is that ambience can only evolve if there is an experiencing subject. However, it is not an inherent part of the subject[14] but rather objective as the result of an effect evoked by a specific constellation of things.[15] Thus, to Böhme the concept of ambience becomes the main designator for the conditions of perception, the "primary object for perception":[16]

> Obviously, ambiences are neither conditions of the subject, nor characteristics of the object. Still, however, they are only experienced in the actual perception of a subject and are co-constituted in their being, their character, through the subjectivity of the perceiver. And even though they are not characteristics of the objects, they are obviously produced through the characteristics and interplay of objects. That is, ambiences are something *between* subject and object. They are not something relational, they are the relation itself.… For us, the ambience is the first reality of perception [*Wahrnehmungswirklichkeit*], out of which subject and object can be separated.[17]

In this context, three aspects of Böhme's theory are particularly important.

First, as a theory of sensuous experience and relation, to Böhme the main concern of aesthetics is how ambience works and constitutes a specific relation between subject and object: "For aesthetics, the ambiences are therefore the first and essential reality. They are the perceptible co-existence of subject and object."[18] In Böhme's perspective, there might be a "real reality" behind the operations of ambience, but what is important for aesthetics is the "reality of appearance" which puts an emphasis on how (perception

13 "le corps appartient à l'ordre des choses comme le monde est chair universelle." Ibid., 176–79.

14 The all-importance of the subject for the way experience and cognition operate stands at the heart of Immanual Kant's influencal epistemology in *Kritik der reinen Vernunft* (1781/87). Kant's point is, basically, that all experience of any "world" is a matter of subjective cognition according to certain unavoidable modes of perception (time, space) and a specific amount of conceptual categories. The weakness of Kant's epistemology is, however, that it doesn't take into account how the world that we meet can have different kinds of expression, thus generating a certain feed-back on the conditions of experience.

15 Gernot Böhme, *Atmosphäre. Essays zur neuen Ästhetik* (Frankfurt a.M.: Suhrkamp, 1995), 33.

16 Ibid., 48.

17 Böhme, *Aisthetik*, 54–56.

18 Ibid., 57.

Figure 1 (above)
Railway clock, 1944.
Design: Hans Hilfiker
Photo credit: MOBATime

of) "reality" is mediated through ambience, on the effect of surface and form, and on the value of staging meaning.[19]

Second, ambience is experienced and expresses itself as a coherent unit. Instead of separating the various aspects of sensuous experience (i.e., sight, hearing, scent, etc.) and asking how one sense can evoke effects in another, ambience functions as the perceptual background upon which things and surroundings present themselves, and where one may look for sensuous differentiation. In this context, Böhme discusses the traditional aesthetic concept of synaesthesia and especially the power of color.[20]

And, third, ambience is not only something to be experienced but also something to be *made*, or manipulated. Böhme speaks of "aesthetic work," the intention of giving things, surroundings, and people certain qualities that let them appear as something special with a power of appeal to be perceived in a certain (controlled) way.[21] In this context, he mentions creative areas such as stage work, commercials, art, architecture, and design as examples. This notion of aesthetic work is clearly linked to today's prevalent concept of experience economy[22] and to the way in which our surroundings—especially with the help of design—can be seen as "aesthetically calculated," where the artifacts in question are conceived with a high degree of "aestheticity," construed to be perceived "aesthetically."[23]

Design as a Structure of Appearance

The strength of Merleau-Ponty's phenomenological and Böhme's aesthetic-philosophical frameworks is that they conceptualize the relation of sensual experience between subjective apprehension and objective appearance. However, the basic shortcoming of Merleau-Ponty's theory is that he does not address the issue of the meaning and importance of *how* the world appears to us with its concrete things, surroundings, and people. Merleau-Ponty thus follows the phenomenological dogma of reducing the world of phenomena to abstracta in order to investigate the basic structure of experience in itself. Böhme, on the other hand, through the notion of ambience, seeks to conceptualize the importance of the *specific* world we encounter, but in the end, he too remains in the realm of abstract speculation through his main philosophical interest in issues of, for example, the notion of perception.[24] In dealing with an increasingly designed and aesthetically staged world, we need more precise concepts to discuss the structure of appearance. In relation to this, in a philosophical, cultural, and material context, design is important as a major means of structuring the appearance and the surface that signifies "world" in our perception and cognition. An example of an important design would be Swiss engineer-designer Hans Hilfiker's famous 1944 railway clock, which by emphasizing the importance of the *minute* as a "signum" for time's regularity sets the stage for a functional experience of time (Figure 1). The question, then, is how

19 Ibid., 121, 159–64. The Danish philosopher Carsten Friberg has written widely and comprehensively on these questions, see *Æstetiske erfaringer* (Copenhagen: Multivers, 2007) and (ed.) *Det æstetiskes aktualitet* (Copenhagen: Multivers, 2006).

20 See especially the essay "Synästhesien" in *Atmosphäre*, 85–98.

21 Böhme, *Atmosphäre*, 35

22 Böhme calls it "aesthetic ecomony," but in my opinion, the sociologically founded concept of experience economy is more powerful. See also Gerhard Schulze, *Die Erlebnisgesellschaft: Kultursoziologie der Gegenwart* (Frankfurt a.M.: Campus, 2005).

23 In the words of Morten Kyndrup, *Den æstetiske relation* (Copenhagen: Gyldendal, 2008), 102.

24 I thank Carsten Friberg for making me aware of this point.

the world of (designed) objects in general influences the modality of the experiencing subject (i.e. the conditions of experience and how the objects' contribution to experience can be analyzed).[25]

As an example of a kind of design that creates an ambience and thus stages a certain kind of relation between subject and object, I point to the interior design created by the Danish designer Verner Panton (1926–1998).[26] Interior design often evokes a high aesthetic effect of ambience because it is capable of creating an encapsulating and highly calculated environment. This is certainly the case in Panton's exhibition project *Visiona II* (1970, Figure 2), his interior design for Spiegel in Hamburg (1969, the basement swimming pool in Figure 3), and his home in Basel, Switzerland (the dining room in Figure 4). With the ambition of being a sort of surrealist—or rather psychedelic—*Gesamtkunstwerk* and seeking to suspend the normal coordinates of space, Panton's projects show design at its extreme, rethinking and reshaping our conception and perception of the environment.[27] Panton's interior designs work explicitly and intensely with founding constituents of ambience such as the powerful *color*, the texture, fabric and layers of *materials* and *surfaces* (especially materials that were new at Panton's time), and elements of *form* as variations of geometry. In this way, Panton not only creates a certain ambient space that suspends the traditional organization of space; he intensifies this ambience. In the words of Martin Seel, Panton's spaces enable a kind of "aesthetic perception," *ästhetische Wahrnehmung*, that not only invests itself in the immediate appearance—a key word for Seel—of the world, in the sense that the world is given to us as "a momentary and simultaneous abundance of appearance," but also intensifies the appearance of the pure

25 This is not quite the same as, but does not exclude, the dogma of material culture studies of design as a "meaning-making process" that "encompasses the materialization of the physical world as a human project of creation"; Judy Attfield, op. cit., 20. Whereas Attfield's theory is sociologically founded in its focus on "the way people construct and interact with the modern material world through the practice of design and its objectification—the products of that process," where design thus is conceived as "a practice of making meaning material" (Ibid. 12 and 42), my aim is to put emphasis on the implications in a phenomenological context for the meeting between subject and object, thus acknowledging the power of the specificity of the object.

26 For an elaborate introduction, see (with English text) Ida Engholm, *Verner Panton* (Copenhagen: Aschehoug, 2005).

27 This was, interestingly, also the ambition of the historic functionalism in architecture, e.g. in the ideas of Le Corbusier, with the intention of, through the build environment, creating new conditions for living.

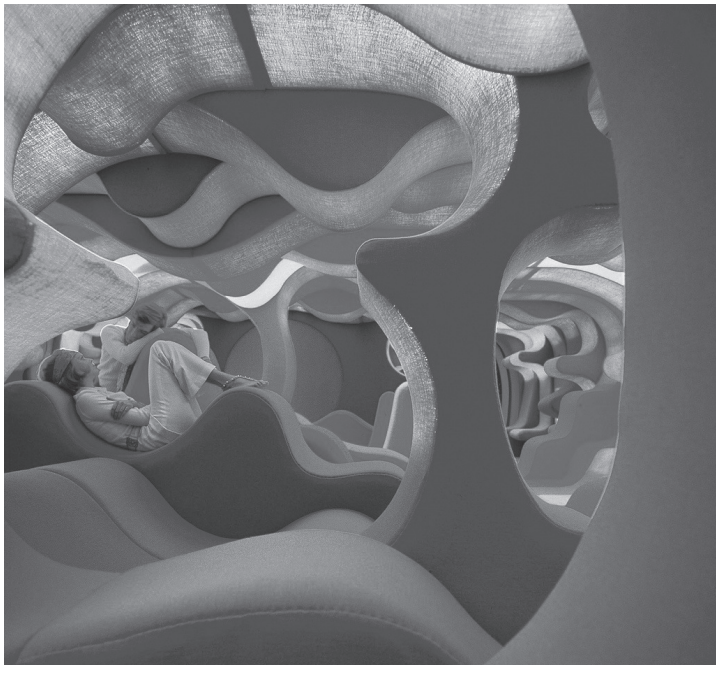


Figure 2 (right)
Visiona II, exhibition project, 1970.
Design: Verner Panton
Photo credit: Panton Design

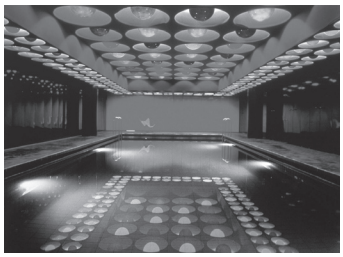


Figure 3 (above)
Interior design for the basement swimming pool in the Hamburg headquarter for the German magazine *Der Spiegel*, 1969.
Design: Verner Panton
Photo credit: Panton Design

Figure 4 (below)
Dining room in the home in Basel, Switzerland, 1985.
Design: Verner Panton
Photo credit: Panton Design

present that is otherwise inaccessible to ordinary perception.[28] Thus, to Seel, aesthetic perception is a matter of looking in a certain intent way that involves *attention for the play of appearances*. The focus is still on the given objects, which are simply seen in another way, that is, with an enhanced sense of the presence of the situation.[29] The point in this context is that Panton's design points reflectively to itself and urges a kind of "aesthetic perception," apparently "wanting" to be perceived with an enhanced sense of presence, of being in exactly this room, here and now, and achieving exactly this through "designerly" and sensuous means such as color, materials, and form. By combining these means into a whole, one can create not only ambience but also a reflective space that questions how space is perceived.

2. An Aesthetics of Communicative Self-reflection

Merleau-Ponty's second interlaced structure is also bound to concrete experience but has to do with the way in which every concrete, visible manifestation carries with it an invisible idea or meaning. He speaks of a bond "of the flesh and the idea, of the visible and the inner brace [*l'armature intérieure*] that the visible makes manifest and hides," meaning that the idea is not the contrary of the sensual but instead its *double* and its *depth*.[30] An additional point is that the idea, though always a part of the sensual, cannot reach the surface of direct manifestation; instead it operates as a "transparence behind the sensible."[31] This idea paradoxically hides and displaces itself *as* it comes to manifestation. The radicalism in this dialectic of the sensual and the idea lies in the fact that Merleau-Ponty breaks with the metaphysic, post-platonic notion of the idea as something other-worldly or transcendent. According to Merleau-Ponty, the idea may be difficult to grasp, but it is always inherent in the sensual—as a structure of immanent transcendence.

It is this structure that I now wish to investigate in the context of aesthetics and design. In the same way that the sensuous relation of an appealing object and a sensitive subject can be called aesthetic, I wish to shed a light on the relationship between sensuous surface and incarnated idea to further our understanding of why some objects are regarded as aesthetic. That Merleau-Ponty's notion of incarnated ideas can be applied to design is obvious: every piece of design contains an idea, a dimension of immateriality; vice versa, design is only conceivable as something concretely manifested—when speaking of immaterial design, Merleau-Ponty's structure of interlaced meaning indicates that it is nothing without some sort of physical manifestation. The structure must, however, be elaborated if it is to contribute to the field of aesthetic knowledge. I consider this to be a matter of *communication*, that is, specifically, how the relation of manifestation/idea displays itself in design. Whereas the question up till now has been how design establishes a sensuous relation with a perceiving and experiencing subject, the question now relates to

28 Martin Seel, *Die Macht des Erscheinens* (Frankfurt a.M.: Suhrkamp, 2007), 13.

29 Ibid., 14. The same critique that can be raised against Böhme for only being interested in *how* something appears not *what* specifically also applies to Seel.

30 Merleau-Ponty, *Le visible et l'invisible*, 193.

31 Ibid., 194.

the object itself, asking how the object in its sensual being points to a level of idea content or meaning, which, in a complex process of displacement, it simultaneously contains and conceals.[32]

I consider this operation aesthetic in two ways. First, it unfolds through the sensual being of an object, which links it to the aesthetics of the sensual relation. Second, the relation of physical manifestation and idea, which can be more or less direct and more or less problematic, has also been a topic of modern, art-based aesthetic theory. The question has been how the work of art is constituted through a specific "form" that (un)reveals its meaning and/or resists understanding.[33] In the following, I will focus on this aspect under the heading of *aesthetic coding*, which examines how an object can not only attract attention and appeal to the senses (as in the sensual relation) but also be constituted in a way where it, in establishing a specific relation of physical manifestation/idea, demands or even commands a specific order of alignment or mode of understanding. It is clear, however, that every process of aesthetic "appreciation" implies a perceiving and aesthetically focused subject; nevertheless, at the same time, categories of aesthetically appealing objects—objects wanting to be perceived *as* aesthetic—can be separated from other objects. The Russian linguist Roman Jakobson speaks of a self-reflective "poetic function," which in focusing on the act of communication itself could be more or less activated within language, thus proposing "poetic language" to have a dominance of poetic function.[34] Thus, we can speak of objects with a high degree of "aestheticity," that is, with an implicit, communicative construction that points in this direction.[35] This question of how aesthetic objects communicate can be raised historically, as the process of conceiving aesthetic qualities varies throughout history and especially through the historical process of augmenting aesthetization.[36] However, my focus will be on some of the general constituents of aesthetically coded communication.

The Concept of Added Quality in Aesthetic Objects

How aesthetic objects contain something "more" has been a central topic of modern, art-based theory, from Schelling to Adorno. The ability to articulate this aspect has been one of the major benefits of this kind of theory and is far from obsolete today, although it may at one time have been too narrowly focused on art. Besides, it holds considerable potential for criticism of the operations and contexts of aesthetic phenomena—something that has been sorely neglected by the aesthetic theory directly related to design.[37]

Thus, in his influential *Ästhetische Theorie*, Adorno discusses art as a medium that paradoxically is inevitably bound to the reality of the given (which, critically, for Adorno is necessarily problematic, as the given in its fundamental structures is negatively conceived as the result of an economic exchange that leads to human inauthenticity and a leveling of values), while at the same time having the

32 Thus, this way of conceptualizing meaning differs from Krippendorff's semantic theory, which doesn't explore the actual *kind* of expression of the meaning in depth.

33 C.f. a whole line of aesthetic theory on German ground: from Adorno, *Ästhetische Theorie* to Christoph Menke, *Die Souveränität der Kunst* (Frankfurt a.M.: Suhrkamp, 1991), Rüdiger Bubner, *Ästhetische Erfahrung* (Frankfurt a.M.: Suhrkamp, 1989), Karl-Heinz Bohrer, *Die Grenzen des Ästhetischen* (München: Carl Hanser Verlag, 1998), and Joachin Küpper & Christoph Menke (eds.), *Dimensionen ästhetischer Erfahrung* (Frankfurt a.M.: Suhrkamp, 2003).

34 See Roman Jakobson's seminal article: "Closing Statement: Linguistics and Poetics" In *Style in Language*, ed. Thomas A. Sebeok (Cambridge: MIT Press, 1960), 350–77.

35 Morten Kyndrup, *Den æstetiske relation*, 102. With a reluctance to speak of aesthetics in design, Attfield instead talks of "things with attitude" as a category of objects inherent of a self-awareness for envisaging change.

36 See to this Mike Featherstone, *Consumer Culture & Postmodernism* (London: Sage, 1991).

37 Böhme, for instance.

potential to transcend the given. Or, put another way: even though art must encompass a figuration of the "other" of the given, it must always be on basis of the given; as Adorno says, "the non-being in the works of art is a constellation of being."[38] Adorno is constantly trying to address this unresolved paradox, which in turn contributes to the everlasting energy of his work and demonstrates a structure of the aesthetic medium where, through its own means, it stands constantly on the verge of something else, the "other," the negation of the given. He says that "phantasy" cannot be "that cheap ability to escape being in proposing a non-being as if it existed"; instead it can transform "what the works of art always absorbed from being, into constellations, through which they become the other of being, is it also only through the specific negation of being."[39]

A common feature of much aesthetic theory has been to conceptualize how art can represent or contain something that is otherwise unrepresentable or incomprehensible, thus functioning as a medium for an otherwise ungraspable surplus of meaning. Thus, for Adorno, art produces something "more," evoking a "Herstellung des Mehr." It produces its own transcendence of meaning that is not directly represented by the work of art but comes to expression as an otherness (*ein Anderes*) paradoxically conveyed by and separated from the structure of the work of art[40]—in the same way that the work of art is both connected and opposed to the material structures of society. Following this line of thought, Martin Seel is also interested in the surplus of meaning that aesthetic objects can communicate, but he does not limit himself to the sphere of art, although art is often his main topic. With a focus on the function of human perception in the process of confronting something "other" in a surplus of meaning, Martin Seel claims that art's ability is to "bring forward otherwise unrepresentable circumstances." Art, in his view, has to do with:

> …ways of human commitment in the real or the unreal, in conditions of the world in the past, the present, or the future. Ways of *meeting the world* [*Weltbegegnung*] are put forward, whereby ways of *meeting the meeting of the world* [*Arten der Begegnung mit Weltbegegnung*] will be possible.[41]

Further, this process of meeting ways of meeting the world is not tied to goal-oriented understanding but to a meeting *outside* the artwork *in* the human subjects themselves:

> …objects of art are medium for an experience that takes place as a process of an understanding that isn't oriented towards a result of an understood.... Understanding art is more about an otherwise impossible meeting with otherwise impossible possibilities of perceiving ourselves.[42]

As objects of everyday life, it may perhaps be difficult to see design in this context of an aesthetic negation of reality and proposals

38 Adorno, *Ästhetische Theorie*, 204.

39 Ibid., 258f.

40 Ibid., 122.

41 Martin Seel, *Ästhetik des Erscheinens* (München: Hanser, 2000), 184.

42 Seel, *Die Macht des Erscheinens*, 38.

of new models of understanding. Still, though, it is worth asking designed objects the difficult question concerning *how they define a relation to reality in the relation of physical manifestation/idea, and how they can be seen as mediums for meeting the world in new and/or reflective ways where new kinds of experience and of experiencing are evoked*.

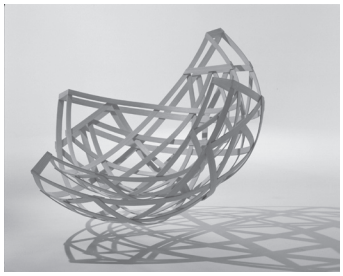
In the case of Panton, the conceptual framework of inquiring about the aesthetics of communicative structures can lead to different levels of questions. First, it is obvious that for Panton, it is not enough to inquire about the sensual effects of ambience. One must also inquire about the idea content, which in this case has to do with proposing a utopian vision of new modes of being and living in and with design. In the historical and cultural context of the 1960s, Panton's design can be seen as a provocative response to a climate of increasing and pervasive cultural conformity with little room for alternative ways of living. In this broad ideological context, Panton's design, roughly speaking, proposes a new model for life. Second, we can ask how Panton's design proposes new orders of experiencing and meeting the world. Only by raising this question can we fully appreciate the radicalism of Panton's design: it not only *contains* a pure idea as a non-obliging experiment but *performs* and *executes* the utopian potential of this idea. Panton's design contains a strong and ideologically biased idea of living differently but only expresses this idea through a physical manifestation. In short, his design tries to lead us, "afford" us,[43] to live in new ways that could hardly be imagined *before* the realization and presentation of the design. In this sense, his design also encompasses a dimension of *performatively* implying an irreversability of a "before" and "after"—the way we think of and experience design can never be quite the same again. Thus, it performs the new kind of being that it states on an ideological level. In and through its physical manifestation, Panton's design not only suggests an idea of living differently, it fundamentally challenges our very understanding of design.

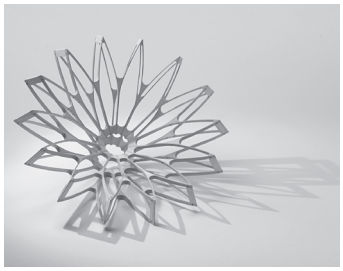
Working with Aesthetics in Design

On an abstract level, we can ask a number of questions regarding design's relation to its content of meaning. I will argue that aesthetics in design is a matter of how design relates to meaning. It is not enough to ask *what* the meaning of a specific design is on a conceptual level (the "idea"), we must also ask *how it performs or reflects this meaning in its physical form*, and how it relates to the kind of *self-reflective "aesthetic function"* where it displays a surplus of meaning. In this way, discussing aesthetics in design is a way of consciously focusing on dimensions of meaning in design, but also, on behalf of the designers, on the *construction* of meaning. *How can a surplus of meaning be invested in design, and how can it be reflected in an actual piece of design?*

Panton points to one possible direction in allowing the basic idea to be so pervasive and effective in his design that it not only

43 As in James J. Gibson's concept of *affordance*, that is, the constrained possibilities for specific actions inherent in an environment or an object; see "The Theory of Affordances," in *Perceiving, Acting, and Knowing*, eds. Robert Shaw and John Bransford, (New Jersey: Hillsdale, 1977). This notion has been especially productive, for e.g., HCI research, and leaves its traces in Donald A. Norman's *The Design of Everyday Things* (New York: Basic Books, 2002) where it is used to investigate the "perceived and actual properties" of a thing that "determine just how the thing could possibly be used," 9.





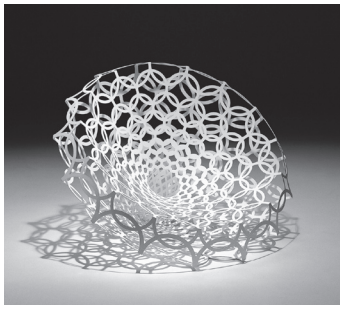


Figure 5 (top)
Honesty. One off chair in ash made through the joining of two identical, but differently scaled layers, 1999.
Design: Louise Campbell
Photo credit: Erik Brahl

Figure 6 (middle)
Bille goes Zen. One off chair in ash named after the cabinet maker Lars Bille Christensen, 2003. Design: Louise Campbell
Photo credit: Erik Brahl

Figure 7 (bottom)
Veryround. Sitting chair made in laser cut 2mm powder-coated steel sheet frame. The chair consists of 260 identical circles in different sizes.
Design: Louise Campbell
Photo credit: Zanotta

stands behind the sensual relation of creating an ambience but also produces a surplus of meaning on an ideological level of a different way of life. Another way of working with aesthetics is to maintain a surplus of meaning but have the idea be more indirectly mediated in the design, that is, less directly performed or displayed in the sense of implying a new overall structure of meaning through the design. This principle can be observed in a series of chairs by the Danish-English designer Louise Campbell (1970). Two of them are one-off chairs, *Honesty* (1999, Figure 5) and *Bille goes Zen* (2003, Figure 6); the third, *Veryround* (2006, Figure 7) is manufactured, in a limited number, by Zanotta, Italy.

Even though the materials vary (the first two are made in ash and the third in two-millimeter powder-coated steel sheet frame), all three chairs can be seen as mediators of the same principle. The construction is based on two identical but differently scaled circular layers centered around a focal point in the middle. Assembled, the two layers produce an expanded, three-dimensional circular structure that stands directly on the floor. Viewed as a continuous series, the chairs represent an ongoing meditation on—and a perfection of a principle of—construction where the latest, *Veryround*, stand as the current culmination. It is not only round in its overall outline but also on the level of detailing, compiled as it is by a total of 260 identical circular modules in different sizes.[44]

Campbell's chairs represent a play with construction and form: the form does not rationally follow the functional aspects of being a chair made for sitting; instead, it follows the experimental principle of the two-circle structure. In this sense, the chairs are attempts at bringing a rather abstract idea to life. The idea, however, does not remain abstract but is (as with most design) sensuously laid out in concrete materials, demanding a place in actual space. Normally, the sensuous qualities of design produce the "extra" element of the design that is often regarded as "aesthetic." Here, of course, the designs are superbly executed and, in the case of the first two chairs, brilliantly handcrafted. But more than anything, it is the idea of the formal and non-functional principle of circularity that creates a surplus of meaning in this design.

As with Panton, the idea pervades and determines the design, and in both cases there is an almost perfect integration of idea and physical manifestation—the idea is only relevant in so far as it is "put to work," and the physical expression of form has hardly any relevance without an idea or meaning content. In my view, this is a hallmark of aesthetics in design. But where Panton's design reflectively points to the fact that there is some kind of idea operating in and through the design (clearly evident in the way his design, appealing directly and aggressively to the senses, performs the utopian idea of a different way of life), in Campbell's chairs the idea is a more subtle, pure form experiment. The idea, of course, is the overall formal and non-functional principle that determines the

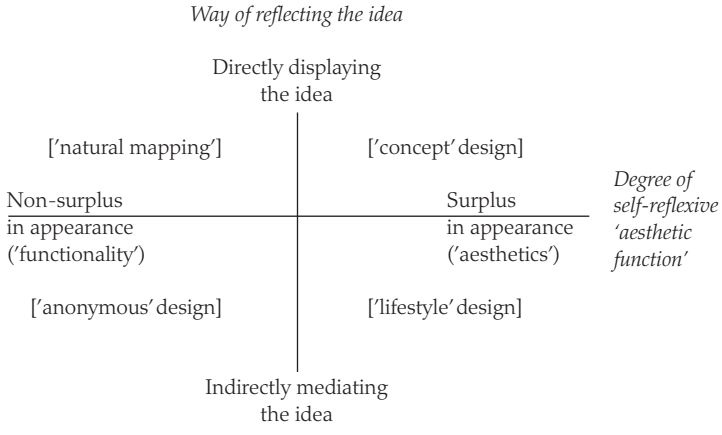
44 For a further description (in Danish), see Mads Nygaard Folkmann, Louise Campbell (Copenhagen: Aschehoug, 2007).

design; however, it simply works through the design and does not reflectively point to itself as "idea."

This structure of investigating how an idea can be reflected in the design and how it can create a surplus of meaning (that is, the overall aesthetic question of *how* design relates to meaning on a general level) can not only be described in design, it can also be used more actively (by designers) as a tool of reflection in the design process.

In relating these two aspects of design as an aesthetics of communicative self-reflection, where the x-axis represents the relation to the "aesthetic function," (that is, the degree of surplus of meaning in relation to functional qualities) and the y-axis represents the reflection of the idea, it is possible to see how different kinds of design communicate differently aesthetically. This coordinate system encompasses *different modes* of aesthetics:

Framework for conceiving aesthetics in design
as the formulation and construction of meaning



"functionality" is not opposed to "aesthetics" as such but according to the two axes has its own kind of aesthetics with a non-surplus in the appearance of the sensuous relation. Designs in this category include the purely functional design of everyday objects that may also reflect the idea content in different ways. At one end of the spectrum there is *anonymous* design, where we simply see through the inherent idea; at the other end of the spectrum there is the kind of *functional* design that displays its idea in a way that only reflects that there *is* an idea but which also, through this mechanism, often explains itself in a process of "natural mapping."[45] Likewise, there can be (as I described in the cases of Panton and Campbell) different modes of aesthetics linked to a great surplus of meaning and appearance. At one end of the spectrum there is the purely conceptual design, which does not, however, entirely circumscribe the modality of Panton's highly sensuous experiments, but which

45 See to this concept Donald A. Norman's functionalist credo in *The Design of Everyday Things*: "Natural mapping, by which I mean taking advantage of physical analogies and cultural standards, leads to immediate understanding," 23.

is prevalent when the conceptual aspect is formulated on the ideological level. The other end of the spectrum is where most "life style" design is found, a type of design that uses a high degree of outer appearance with a surplus of appeal to the users, or rather consumers, and where it is not important that the underlying idea is reflectively stated. Campbell's design is more experimental than "life style" (even though *Veryround* does have its place in the international circulation of high-end furniture), but she operates with the same approach of indirectly putting the idea to work. The experimental focus of her series of chairs is to *challenge* the relation of idea and physical manifestation so that the idea does not take over but has the status of Merleau-Ponty's inner structure, manifesting and hiding itself at the same time. In Campbell's case, aesthetics in design is expressed as an ongoing dialogue of outer appearance, constantly hiding and revealing its meaning content.

In Conclusion: Aesthetic Challenges for Designers

The theoretical framework proposed here can be used in analyses and discussions of aesthetics in design, but it can also inform designers who need to deal practically with the challenges of the aesthetic in design. The two aspects of aesthetics in design that are put forward in this article—design as a structure of sensual appearance, and design as an act of communication that may contain an aesthetic coding that lets an idea or content of meaning be physically manifested and reflected in different ways—can lead to a more theoretically focused inclusion of aesthetic matters in the process of designing.

Thus, I will conclude by indicating how the questions raised in this article can be turned into a series of aesthetic challenges for designers. The first issue is the challenge to work consciously and strategically with the *sensuous* impact of design, that is, to draw specific attention to the nature and function of the sensual when designing. In this way, the concept of "ambience" can become an important addition to the toolbox of design methodology. Further, we may consider how an object can be designed to urge a kind of "enhanced perception." This does not, however, necessarily mean that design needs to flash and mark itself as "design;" it can also be accomplished in the anonymous design of everyday objects through more subtle aesthetics and a more discreet appearance. However, it may prove productive to challenge the aim and scope of design and its means of creating an entire universe of sensuality, as demonstrated in the case of Panton's design, where the power and importance of a sensual relation are achieved through designerly means.

On the level of *communicative self-reflection*, it is possible to raise a series of questions concerning the way in which design communicates and how it can be coded aesthetically in its construction of meaning. First of all, one may consider the kind and function of communication through the actual design—that is, what

"idea" the design should communicate, and how. Within this context, one may attempt to apply the model proposed in this article to the process of designing: the model can be used to clarify which degree and kind of aesthetic coding will be relevant for the actual design; it can clarify how the degree of surplus of meaning in relation to functional qualities ("aesthetic function") relates to this key idea, and how this idea is reflected in the design. In sum, these instruments can be used as an aesthetic challenge to the conventional way of conceiving design and the means by which it is created, thus facilitating the overall development of designerly and practical means of addressing aesthetics in design.

The Structure of Design Revolutions: Kuhnian Paradigm Shifts in Creative Problem Solving

Nathan Crilly

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The author wishes to thank Professor Simon Schaffer from the Department of History and Philosophy of Science at the University of Cambridge for his guidance on matters of Kuhn scholarship.

> Design and other difficult problem solving is punctuated by moments of *discovery*.... These are the moments when something new and important is suddenly "seen."[1]

Introduction

Researchers interested in understanding creative design have studied the genesis, development, and implementation of new ideas in design projects. The findings from such studies can be divided into those that emphasize the sudden emergence of new ideas, and those that emphasize how new ideas are gradually built upon those that precede them. In this article, a unification of these different perspectives is proposed by describing a general structure of creative design progress that accounts for both cumulative and disruptive episodes. This description is based on Thomas S. Kuhn's book *The Structure of Scientific Revolutions*,[2] an historically informed account of scientific progress in which we can find many parallels with observed phenomena in creative design.[3] It is argued that viewing creative design episodes through a Kuhnian lens yields two distinct benefits: first, it can sensitize researchers to the existence of phenomena that are not emphasized by existing accounts; and second, it can sensitize designers to the nature and dynamics of creative progress, and thereby aid reflective practice.

Creativity and design are topics that are studied from a variety of perspectives, and before proceeding further it is worth clarifying our particular frame of reference and the scope of the arguments we will explore. First, because our interest is in design rather than technology, emphasis is placed on the activities that occur *within* particular design projects rather than historical design developments across different product generations.[4] We are also only interested here in *the structure* of creative progress, and not in assessing the degree of creativity attained or in the efficacy of creative methods.[5] It follows that our focus is on descriptive accounts of creative design *as it occurs*, rather than normative models of design as it should be.[6] Finally, we shall be restricted to considering the production and acceptance of ideas that are somehow new to the individuals and groups involved in a design project; we are unconcerned with whether such ideas are also new to the world because it is *psychological* rather than historical phenomena that are

1 Elaine Kant and Allen Newell, "Problem Solving Techniques for the Design of Algorithms," *Information Processing and Management* 20:1–2 (1984), 109. Emphasis in original.

2 Thomas S. Kuhn, *The Structure of Scientific Revolutions*, (Chicago: University of Chicago Press, 1996 [3rd edition]).

3 In this article reference is made to scientific "progress," "advance," and "development" in the sense that Kuhn used these terms, not as an increasing convergence on truth, but as an ongoing change in perspective. See Kuhn, *The Structure of Scientific Revolutions*, 205–6.

4 For studies of design developments across product generations see Henry Petroski, *The Evolution of Useful Things* (London: Pavilion, 1993); Walter G. Vincenti, *What Engineers Know and How They Know It: Analytical Studies from Aeronautical History* (Baltimore: Johns Hopkins University Press, 1990).

5 c.f. Jami J. Shaha, Steve M. Smith, and Noe Vargas-Hernandeza, "Metrics for Measuring Ideation Effectiveness," *Design Studies* 24:2 (2003), 111–34.

of relevance.[7] As the title indicates, we are interested in the structure by which acts of creative problem solving advance design. This is irrespective of the design discipline within which those acts are situated or the products towards which they are directed.

The article is divided into several sections, intended not just to develop a Kuhnian perspective on creative design, but also to more generally explore the many issues that surround such a perspective. We begin by reviewing different accounts of creative design progress, and by then reviewing Kuhn's account of scientific advance. To explain how the latter relates to the former, it is argued that processes of scientific discovery mirror activities of creative design. The influence of Kuhn's work is then discussed, looking for precedents in which his concepts have been used to illuminate the way in which design projects move forward. Having done this, we are able to read Kuhn's work as though he is describing observed design behavior, and nine key propositions are derived that collectively describe the structure of creative progress in design projects. Finally, opportunities for further theoretical and empirical work are discussed as we consider the broader implications of relating scientific discovery to creative design.

Creative Design Progress

Creative design has always proved a difficult activity to define satisfactorily, and there have been many problems in establishing criteria by which it might be identified.[8] Despite this, the literature on creativity and design often requires a creative idea to be recognized as both novel and appropriate.[9] While different design activities demand or permit different levels of creativity, design solutions that are not immediately obvious from the problem statement must require the generation of novel and appropriate ideas, and must therefore require creativity. Creativity is consequently considered to be an important aspect of design performance and is the stated objective of much design education.[10] As a contributor to product innovation, creative design is also a key determinant of many organizations' commercial success and of a nation's economic health.[11] In combination, these factors all serve to promote the importance of modeling, enhancing, and assessing creative design. Developing a basic understanding of creative design underpins these activities, and descriptive accounts of creative progress provide a foundation for such understanding.

Design progress within projects is often described in terms of suddenly emerging ideas that are variously termed "eureka events," "ah-ha moments," or "creative leaps."[12] Such ideas may seemingly lack preparation or precedence but can subsequently define a new and fruitful direction for the project.[13] While often considered obvious once they have been recognized, these sudden insights may appear to share little logical connection with previous solution attempts.[14] One reason that these moments of insight are necessary at all is

6 Unlike his predecessors and contemporaries in the history and philosophy of science, Kuhn insisted that interesting and important things could be said about how science is actually practiced rather than just how it should be practiced. This is one reason why we might base our proposed descriptive account on Kuhn rather than other philosophers of science. However, there is a subtle complication here because Kuhn believed that science operates effectively and that scientists should behave as they already do. He therefore asserted that his account of science is both descriptive *and* normative. See Thomas S. Kuhn, "Reflections on My Critics," in *Criticism and the Growth of Knowledge: Proceedings of the International Colloquium in the Philosophy of Science, London, 1965, Volume 4*, ed. Imre Lakatos and Alan Musgrave (Cambridge: Cambridge University Press, 1970), 237.

7 Margaret Boden famously distinguishes between individuals who are psychologically creative (*P-creative*)—having a more or less sustained capacity to produce ideas that are new to them, and those who are historically creative (*H-creative*)—having arrived at one or more ideas that are new to the world. Both types of creativity are initially defined with respect to ideas, but then these ideas are used to define the people responsible for them. See Margaret A. Boden, *The Creative Mind: Myths and Mechanisms* (London: Weidenfeld and Nicolson, 1990), 32–35. For application of these ideas to design see Subrata Dasgupta, *Creativity in Invention and Design: Computational and Cognitive Explorations of Technological Originality* (Cambridge: Cambridge University Press, 1994), 18; Christiaan Redelinghuys, "Proposed Criteria for the Detection of Invention in Engineering Design," *Journal of Engineering Design* 11:3 (2000), 273.

8 This follows from problems in defining creativity itself. For example, see Robert J. Sternberg and Todd I. Lubart, "The Concept of Creativity: Prospects and Paradigms," in *Handbook of Creativity*, ed. Robert J. Sternberg (Cambridge: Cambridge University Press, 1999), 4.

because designers confronted with a problem can assume or infer constraints that limit the solutions they explore.[15] The boundaries of this exploration are expanded when the problem is reframed and designers learn to see things in new ways and to look for new kinds of solution.[16] This suggests that sudden insights might not just relate to the production of creative solutions to a given problem, but also to the creative formulation of the problem itself.[17]

Creative acts often result from long periods of difficult, purposeful struggle—a struggle not only with the idea produced, but also with maintaining the contexts and self-concepts that make such ideas possible.[18] Therefore, although sudden insights (such as those described above) might at first appear to yield an instantaneous solution to the problem, they are often prefigured by similar ideas that were previously neglected or are later forgotten.[19] With respect to design, such observations lead to the suggestion that what might otherwise be considered a creative leap between analysis and synthesis could actually involve incrementally "bridging" between the problem and solution with various sub-problems and sub-solutions.[20] This corresponds with Ullman et al.'s fine-grained, empirically derived model of the design process, in which progress is gradual and cumulative.[21] In the absence of right or wrong answers, there would appear to be little basis for abandoning interim design solutions, and therefore design information is said to increase monotonically throughout a project.[22]

The two preceding paragraphs outline two apparently conflicting perspectives on creative design progress. The first promotes the notion of sudden, revolutionary leaps forward, while the second focuses on how ideas are incrementally built upon those that precede them.[23] There is generally little attempt made to relate these different types of developmental episodes and their interdependence remains unexamined. This is in contrast to perspectives on science, where disruptive and incremental episodes of development were famously integrated into a single account by Thomas S. Kuhn in his 1962 book *The Structure of Scientific Revolutions*.[24] Considering creative design from this perspective suggests that a similar integration is necessary for design theory if the structure of creative design progress is to be better understood. To address this, we shall now turn our attention to Kuhn's work, both to gain an understanding of how disruptive and incremental episodes might be characterized, and also of how they might be related.

The Structure of Scientific Revolutions

Kuhn's account of scientific development distinguishes between relatively stable periods of cumulative progress called "normal science," and disruptive episodes of relatively sudden change called "revolutionary science." In normal science, the research community shares a common set of beliefs, values, and techniques, and they also agree on what work can be regarded as exemplary.

9 Raymond S. Nickerson, "Enhancing Creativity," in *Handbook of Creativity*, ed. Sternberg, 392–93; T. J. Howard, S. J. Culley, and E. Dekoninck, "Describing the Creative Design Process by the Integration of Engineering Design and Cognitive Psychology Literature," *Design Studies* 29:2 (2008), 172–73. In addition to being novel and appropriate, a third condition is sometimes imposed, such as the requirement to be non-obvious, surprising, transformative, or efficient, ibid.

10 Henri H. C. M. Christiaans, *Creativity in Design: The Role of Domain Knowledge in Designing* (Utrecht: Lemma, 1992), ix, xi, 1, 2, 11.

11 George Cox, "Cox Review of Creativity in Business: Building on the UK's Strengths" (London: HM Treasury & Department of Trade and Industry, 2005).

12 Ömer Akin and Cem Akin, "Frames of Reference in Architectural Design: Analysing the Hyperacclamation (a-H-a-!)," *Design Studies* 17:4 (1996), 341–61; Nigel Cross, "Descriptive Models of Creative Design: Application to an Example," *Design Studies* 18:4 (1997), 427–40; Kees Dorst and Nigel Cross, "Creativity in the Design Process: Co-Evolution of Problem–Solution," *Design Studies* 22:5 (2001), 434.

13 Kant and Newell, "Problem Solving Techniques," 109.

14 Donald T. Campbell, "Blind Variation and Selective Retention in Creative Thought as in Other Knowledge Processes," *Psychological Review* 67:6 (1960), 384.

15 David G. Jansson and Steven M. Smith, "Design Fixation," *Design Studies* 12:1 (1991), 3–11; A. Terry Purcell and John S. Gero, "Design and Other Types of Fixation," *Design Studies* 17:4 (1996), 363–83; Evangelia G. Chrysikou and Robert W. Weisberg, "Following the Wrong Footsteps: Fixation Effects of Pictorial Examples in a Design Problem-Solving Task," *Journal of Experimental Psychology: Learning, Memory, and Cognition* 31:5 (2005), 1134–48. For an industrial example of fixation see Michael. J. French, *Conceptual Design for Engineers* (London: Design Council, 1985 [2nd edition]), 187–88.

These characteristics collectively define the prevailing "paradigm" within which scientists work. This paradigm directs attention to the scientific puzzles that must be solved, and scientists are focused on the extension and articulation of the paradigm rather than seeking its replacement. Over time, the cumulative refinement of the paradigm generates a range of observations that are seen as being anomalous with theory, and, despite resistance, these anomalies eventually provoke crisis.

In response to mounting crises, revolutionary science involves the proposal of a new perspective that fundamentally challenges the assumptions, orientations, and expectations of the community. This proposal may be accepted and thereby replace the existing paradigm if it promises to resolve some remaining problems while also preserving some of what has already been achieved. These "paradigm shifts" often demand the re-examination of previously established knowledge as not all of the preceding paradigm survives the revolution. Such shifts also define new directions for research by rendering previous puzzles unproblematic and by pointing to new puzzles that must be solved. In time, the newly accepted paradigm becomes the basis for another period of normal science which may in the future encounter crises that again provoke revolution. (For readers unfamiliar with Kuhn's thesis, an illustrative example of a scientific paradigm shift—the "Copernican revolution" in astronomy—is provided in the appendix.)

Relating Scientific Discovery to Creative Design

Kuhn's account of scientific progress clearly integrates cumulative and disruptive episodes, and also suggests how each type of episode is related to the other. What is not immediately clear, however, is why an historically informed account of the processes that lead to and follow scientific discovery should be considered relevant to the episodes of creativity that occur within contemporary design projects. Science and design are ostensibly distinct branches of human activity, as exemplified by the educational, cultural, and professional divisions that typically separate them.[25] As such, the suggestion that studying one can illuminate the other demands further scrutiny. Before asserting Kuhn's relevance to design, we must therefore first seek to establish the plausibility of such an assertion, and identify the precedents upon which it might be based.

Many studies of creativity examine the work of artists and scientists in an attempt to uncover the cognitive processes that are common to both.[26] Such studies seldom make reference to design, but like design, both artistic creativity and scientific discovery can be considered as problem solving activities.[27] Acts of discovery and creation can thus be established as lying on a continuum where the solutions to highly constrained problems must be *discovered* while the solutions to relatively unconstrained problems are *created*.[28] From this perspective, the nature of creative acts is not defined by the

16 Donald A. Schön, *Invention and the Evolution of Ideas* (London: Tavistock, 1967); Donald A. Schön, *The Reflective Practitioner: How Professionals Think in Action* (London: Temple Smith, 1983); Rianne Valkenburg and Kees Dorst, "The Reflective Practice of Design Teams," *Design Studies* 19:3 (1998), 249–71. Such reframing may take place with respect to an understanding of the problem or an understanding of how design is to be conducted. See Raymonde Guindon, Herb Krasner, and Bill Curtis, "Breakdowns and Processes During the Early Activities of Software Design by Professionals" (paper presented at the Empirical studies of programmers: second workshop, Norwood, NJ, 1987), 71–74.

17 Mary Lou Maher and Josiah Poon, "Modeling Design Exploration as Co-Evolution," *Microcomputers in Civil Engineering* 11:3 (1996), 195–209; Dorst and Cross, "Creativity in the Design Process," 434.

18 Howard E. Gruber, "The Evolving Systems Approach to Creative Work," in *Creative People at Work: Twelve Cognitive Case Studies*, ed. Doris B. Wallace and Howard E. Gruber (Oxford: Oxford University Press, 1989), 3–24.

19 David N. Perkins, *The Mind's Best Work* (Cambridge: Harvard University Press, 1981), 43–49.

20 Cross, "Descriptive Models of Creative Design," 432, 439; Nigel Cross, *Designerly Ways of Knowing*, (London: Springer, 2006), 92.

21 David. G. Ullman, Thomas. G. Dietterich, and Larry A. Stauffer, "A Model of the Mechanical Design Process Based on Empirical Data," *Artificial Intelligence in Engineering Design and Manufacturing* 2:1 (1988): 35, 41.

22 Vinod Goel and Peter Pirollia, "The Structure of Design Problem Spaces," *Cognitive Science* 16:3 (1992): 406, 420–21; Subrata Dasgupta, *Design Theory and Computer Science: Processes and Methodology of Computer Systems Design* (Cambridge: Cambridge University Press, 1991), 77ff.

fields to which they are directed (e.g. art, technology, science), but by how tightly bound the solution space is, and by what factors determine that boundary (e.g. cultural, economic, physical).[29] Such observations permit Dasgupta's view that "the process of inventing artifactual forms (or creating original designs) in the artificial sciences is cognitively indistinguishable at the knowledge level from the processes of inventing theories or discovering laws in the natural sciences."[30] Intuitive support for this may be found in the language that is used to describe the production of new ideas in science and design: while natural phenomena are *discovered*, the theories to explain those phenomena are *invented*; conversely, while artifacts might be *invented*, the process of invention involves moments of *discovery*.[31]

In his substantial study of creativity in different times and cultures, Koestler argues that the basic pattern of progress observed in creative individuals is similar to that observed in the history of the fields they serve.[32] In both, there are short bursts of revolutionary discovery that punctuate longer periods of assimilation, consolidation, and interpretation. Furthermore, Koestler claims that the mechanism that underlies this pattern is also similar: revolutions are held at bay by a personal or cultural "blindness" that is imposed by the existing paradigm.[33] From a psychological perspective, Perkins makes similar arguments, claiming that Kuhn's idea of collectively accepted paradigms fits the general notion of personally established schemata (where schemata are the mental structures that allow a person to perceive or act effectively by anticipating the organization of what is apprehended or produced).[34] This leads Perkins to propose that, like paradigms, schemata enable skilled performance within their scope, while severely inhibiting creativity beyond their scope.[35] Such claims allow the possibility of drawing parallels between historical accounts of collective discovery on the one hand, and shorter episodes of individual creativity on the other.

The arguments above suggest: first, that similarities might be observed between the nature of scientific discovery and that of creative design; and second, that the patterns enacted on an historic scale may mirror those observable on a personal scale. With respect to the first point, Kuhn acknowledged this by claiming that long before his own work on the structure of scientific advance, historians had portrayed the humanities as developing through a similar succession of traditions punctuated by revolutionary shifts in style, taste, viewpoint, and goal.[36] With respect to the second point, Kuhn's applicability to personally creative acts should perhaps not surprise us because Kuhn was generally interested in the nature of conceptual change, not just in infrequent scientific change.[37] He asked what sort of ideas could be thought of at any one time, and what sort of impact a given idea could have on collective understanding and action. Such questions are clearly relevant to progress in design and

23 Such a distinction might typically be labeled "revolutionary" versus "evolutionary," but this terminology is avoided here because evolutionary theories can also account for sudden change. See Niles Eldredge and Stephen Jay Gould, "Punctuated equilibria: an alternative to phyletic gradualism," in *Models in paleobiology*, ed. Thomas. J. M. Schopf. (San Francisco: Freeman, Cooper & Co, 1972), 82–115. Nevertheless, accounts of design progress frequently make reference to the concepts of biological evolution because they provide an interesting analogical approach to describing the creative development of ideas. For psychological perspectives, see Dean K. Simonton, "Creativity as Blind Variation and Selective Retention: Is the Creative Process Darwinian?" *Psychological Inquiry* 10:4 (1999), 309–28. For design perspectives see Philip Steadman, *The evolution of designs: biological analogy in architecture and the applied arts,* (Cambridge: Cambridge University Press, 1979); John Z. Langrish, "Darwinian Design: The Memetic Evolution of Design Ideas," *Design Issues* 20:4 (2004), 4–19; Jennifer Whyte, "Evolutionary Theories and Design Practices," *Design Issues* 23:2 (2007), 46–54. Note that Whyte supports the notion that evolutionary theories are relevant to product development across different generations, but not within a particular design project, ibid., 53. For Kuhn's perspective on evolutionary accounts of conceptual progress see Kuhn, *The Structure of Scientific Revolutions* , 170–72; "A Discussion with Thomas S. Kuhn," in *The Road since Structure: Philosophical Essays, 1970–1993*, ed. James Conant and John Haugeland (Chicago: University of Chicago Press, 2000), 307.

therefore Kuhn's ideas might be applied there just as they have been successfully applied to other areas that he did not anticipate.[38]

Applying Kuhn to Design

Since its first publication in 1962, *The Structure of Scientific Revolutions* has sold over one million copies in over 20 languages.[39] It has been listed as the most highly cited work in the arts and humanities,[40] and is considered to be one of the most influential books ever written.[41] What is particularly striking is that despite Kuhn's intuitions,[42] his concepts and arguments have been adopted across the social sciences.[43] Furthermore, although often divorced from his originally intended meanings, his terminology—especially "paradigm shift"—has entered into common usage and has been co-opted by disciplines such as marketing, management, and information technology.[44] Because of his extensive influence, it is often remarked—and often seriously—that Kuhn prompted his own paradigm shift within the sociology of knowledge.[45]

Considering the widespread impact of Kuhn's work, there is surprisingly little reference to Kuhn in the design literature. Those who do cite Kuhn often do so summarily, not to support the notion that *design projects* operate within distinct paradigms, but that *design research* does (or might or should).[46] This is understandable given Kuhn's arguments, but is in contrast to the closely related field of technology studies where his concepts have been applied to accounts of technological progress.[47] In particular, Anderson and Tushman build on Kuhn's work to develop a cyclical model where incremental technological progress is punctuated by sudden "technological discontinuities."[48] Constant also builds on Kuhn's work to define periods of "normal technology" and "technological revolution," and Dosi extends Kuhn's concept of paradigms to define "technological paradigms" that account for continuous and discontinuous innovation.[49] Vincenti's study of engineering knowledge brings us closer to design by further building on Constant's work to define the terms "normal design" and "radical design."[50] Unfortunately his focus is on the former, which he describes as an evolutionary process that does not require the invention of new forms, functions, or features. In contrast, Wake's work on "design paradigms" does emphasize paradigm shifts, but primarily with a view to promoting creative progress rather than understanding its structure.[51]

Although the work mentioned above makes reference to Kuhn's terminology and concepts, none focuses on the details of his arguments.[52] For a more extensive exploration of Kuhn's relevance to design we must turn to the work of Dasgupta. Dasgupta exploits the Kuhnian definition of a scientific paradigm to describe not only the research traditions from which design creativity can be studied,[53] but also the models of the design process that designers subscribe to.[54] However, what interests us most here is that Dasgupta's attention to Kuhn leads him to make a comparison between "normal and revolu-

24 *The Structure of Scientific Revolutions* was first published in 1962 as a monograph in the Vienna Circle's *International Encyclopedia of Unified Science*. At Kuhn's request, it was also published as a separate book that same year by the same publisher, University of Chicago Press. In this article we refer to the third edition of the book (1996), which includes a new index and retains the second edition's extensive explanatory postscript (a postscript that Kuhn wrote in 1969 to address critics' responses to the first edition). Despite making various suggestions that a revised and expanded version of the book was necessary, Kuhn had not published this by his death in 1996. For examples of the criticisms to which Kuhn's postscript responds, see Imre Lakatos and Alan Musgrave, eds., *Criticism and the Growth of Knowledge: Proceedings of the International Colloquium in the Philosophy of Science, London, 1965, Volume 4* (Cambridge: Cambridge University Press, 1970).

25 For specific arguments about the relationship between design and science see Nigel Cross, "Designerly Ways of Knowing: Design Discipline Versus Design Science," *Design Issues* 17:3 (2001), 49–55; Jonathan Cagan, Kenneth Kotovsky, and Herbert A. Simon, "Scientific Discovery and Inventive Engineering Design," in *Formal Engineering Design Synthesis*, edited by Erik K. Antonsson and Jonathan Cagan, 442–65. (Cambridge: Cambridge University Press, 2001). For related arguments about the divisions between the sciences and humanities, see C. P. Snow, *The Two Cultures*. (Cambridge: Cambridge University Press, 1993. Includes the 1959 text "The Two Cultures and the Scientific Revolution," together with its 1964 successor piece, "A Second Look").

tionary science" on the one hand and "routine and inventive design" on the other. With routine design, the artifact's general form and behavior are known at the outset, while inventive design involves establishing a new form of artifact or a new approach to the creation of artifacts. Routine design operates within an existing paradigm whereas inventive design proposes a new paradigm that may eventually replace the old.[55] Although Dasgupta may at first appear to be embarking on a project similar to that undertaken here, Kuhn is only one of many scholars who inform Dasgupta's work, and the hypotheses Dasgupta develops do not in themselves represent a Kuhnian perspective on creative design.[56]

Despite the promise that Kuhn's work would seem to hold, his detailed account of the structure within which new ideas are developed, accepted, refined, and superseded appears not to have been applied to the study of creative design. However, it is argued here that Kuhn's historically informed account of scientific progress provides a useful vantage point from which creative design practice might be viewed. Accepting this permits a close reading of *The Structure of Scientific Revolutions* to yield interesting propositions about the structure of progress in creative design projects.

The Structure of Creative Design Progress

If we read Kuhn as though he is describing design rather than science, we can derive a new account of the nature and dynamics of creative design progress. This account is divided into nine propositions which are presented below. Each proposition is introduced with a short quotation from Kuhn, which is then followed by a statement of elaboration. As mentioned earlier, the direct translation of Kuhn's terminology into the design domain has already been performed by authors interested in the historical development of products across different generations. Therefore, to avoid confusing design progress within projects with that between projects, use of the terms "normal design," "revolutionary design," and "design paradigm" are avoided here. Instead, the terms "cumulative design" and "conceptual reorientation" are used to describe the phases through which creative design proceeds.

P1: Pre-cumulative design is undirected.

> In the absence of a paradigm or some candidate for paradigm, all of the facts that could possibly pertain to the development of a given science are likely to seem equally relevant.[57]

If a design problem is considered without any strong conceptual orientation, the many pieces of available design information can become difficult to identify and sort. To address this, various different concepts are tried, and eventually an initial orientation toward the problem, the solution, or the process emerges.

26 For example, see Arthur Koestler, *The Act of Creation* (London: Hutchinson, 1964); Vera John-Steiner, *Notebooks of the Mind: Explorations of Thinking* (Oxford: Oxford University Press, 1997 [revised edition]); Perkins, *The Mind's Best Work;* Teresa M. Amabile, *Creativity in Context: Update to 'The Social Psychology of Creativity'* (Boulder: Westview Press, 1996); Doris B. Wallace and Howard E. Gruber, *Creative People at Work: Twelve Cognitive Case Studies* (Oxford: Oxford University Press, 1989).

27 For design as problem solving, see Herbert A. Simon, *The Sciences of the Artificial* (Cambridge: MIT Press, 1981 [2nd edition]). For art as problem solving, see David Ecker, "The Artistic Process as Qualitative Problem Solving," *Journal of Aesthetics and Art Criticism* 21:3 (1963), 283–90. For science as problem solving, see Pat Langley, Herbert A. Simon, Gary L. Bradshaw, and Jan M. Zytkow, *Scientific Discovery: Computational Explorations of the Creative Processes* (Cambridge: MIT Press, 1987), 5–7.

28 Robert M. French, "Discovery and Creation: Opposite Ends of a Continuum of Constraints," unpublished manuscript, Université de Bourgogne. Although it can be argued that (unlike creation) discovery only involves the "uncovering" of that which already exists, such views are criticized for failing to recognize that discovery is a gradual process of conceptual change involving cognitive re-orientation towards the subject of interest. See Jacob Bronowski, "The Creative Process," *Leonardo* 18:4 (1985), 245; Barnes, *T. S. Kuhn and the Social Science*, 41–45; Kuhn, *The Structure of Scientific Revolutions*, 52–56.

P2: Cumulative design is conservative.

> Normal science does not aim at novelties of fact or theory and, when successful, finds none.[58]

With some particular conceptual orientation established, much work is devoted to exploring its possibilities, and refining its performance. During these periods of cumulative design, efforts are not directed towards generating alternative new concepts, but to developing the existing concept as much as possible.

P3: Cumulative design is productive.

> Normal science…is a highly cumulative enterprise, eminently successful in its aim, the steady extension of the scope and precision of scientific knowledge.[59]

Periods of cumulative design are extremely effective because designers understand the problems to be addressed and know where to direct their efforts. Progress is incrementally achieved because none of the developments fundamentally challenge the underlying concept and therefore retrograde design moves are not encountered.

P4: Cumulative design leads to perceived inadequacies.

> Discovery commences with the awareness of anomaly… It then continues with a more or less extended exploration of the area of anomaly.[60]

Despite the effective progress made during periods of cumulative design, this progress also leads to the perception of various inadequacies that bring into question the underlying conceptual orientation. However, without a new candidate concept to consider, this only provokes renewed efforts to understand how the existing concept can be made to work.

P5: Perceived inadequacies provoke conceptual reorientation.

> Scientists…often speak of the "scales falling from the eyes" or of the "lightning flash" that "inundates" a previously obscure puzzle, enabling its components to be seen in a new way….[61]

Immersed in the inadequacies that are perceived in the existing concept, designers experience a sudden insight that reveals a new possible solution to the problem or a new perspective on the problem itself. Despite its apparent novelty, this insight may have been prefigured by other related ideas, and it is therefore the recognition of these insights rather than their formation that is disruptive.

P6: Conceptual reorientation reveals new problem-solution spaces.

> Led by a new paradigm, scientists adopt new instruments and look in new places. Even more important, during revolutions scientists see new and different things when looking with familiar instruments in places they have looked before.[62]

Conceptual reorientation influences which aspects of the situation are attended to, and also what is perceived in those aspects. Therefore,

29 In this sense, Hafner claims that while distinguishing artists from scientists is an intuitively obvious thing to do, doing so with any precision is a difficult task because each requires a combination of knowledge and skill, each proceeds through processes of creation and discovery, each is sustained by aesthetic and structural sensitivities, and each demands discipline while benefiting from fortune. E. M. Hafner, "The New Reality in Art and Science," *Comparative Studies in Society and History (Special Issue on Cultural Innovation)* 11:4 (1969), 390. Kuhn recognized this view but did not welcome it. See Thomas S. Kuhn, "[The New Reality in Art and Science]: Comment," *Comparative Studies in Society and History* 11:4 (1969), 403–12. For further reading on this matter see David R. Topper and John H. Holloway, "Interrelationships between the Visual Arts, Science and Technology: A Bibliography," *Leonardo* 13:1 (1980), 29–33.

30 Dasgupta, *Creativity in Invention and Design*, 210–11. Also see Dasgupta, *Design Theory and Computer Science*, 353–80. This is perhaps only a specific instance of the more general claim that, like natural scientists, people form and test hypotheses to generate everyday knowledge. George A. Kelly, *The Psychology of Personal Constructs: Volume One—A Theory of Personality* (London: Routledge, 1991 [reprint]), 4–5, 9–11.

31 For invention in science, see Kuhn, *The Structure of Scientific Revolutions*, 8, 52, 66; for discovery in art and design see Ernst H. Gombrich, *Art and Illusion: A Study in the Psychology of Pictorial Representation*, *Mellon Lectures in the Fine Arts* (London: Phaidon Press, 1968 [3rd Edition]); Donald A. Schön and Glen Wiggins, "Kinds of Seeing and Their Functions in Designing," *Design Studies* 13:2 (1992), 135–56.

32 Koestler, *The Act of Creation*, 224–25, 53.

33 Ibid., 236.

34 Perkins, *The Mind's Best Work* , 178.

35 Ibid., 173.

the degree to which the previous concept had prevented exploration (or even perception) of the alternatives becomes apparent as new problem-solution spaces are uncovered.

P7: Conceptual reorientation is resisted.

> In science, … novelty emerges only with difficulty, manifested by resistance, against a background provided by expectation.[63]

Even once recognized, the newly proposed concept proves to be both difficult to comprehend and difficult to accept. Comprehension is inhibited by the fundamentally different perspective that is required, while acceptance is inhibited by the recognition that prior work will be invalidated and future work must proceed from a less well-developed foundation.

P8: Candidate concepts are accepted on promise.

> [T]he new theory is said to be "neater," "more suitable," or "simpler" than the old.… [T]he importance of [these] aesthetic considerations can sometimes be decisive.[64]

Given the potentially well-refined state of the existing concept, new candidate concepts may at first not compete well with those they are proposed to replace. Consequently, new concepts must be accepted for development on the basis of their apparent promise rather than their current performance. This promise may be assessed with respect to qualities that cannot be defended rationally, and with recourse to intuition rather than measurement.

P9: Conceptual reorientations are incomplete.

> [T]he puzzles that constitute normal science exist only because no paradigm that provides a basis for scientific research ever completely resolves all of its problems.[65]

The acceptance of a new concept prompts a renewed process of cumulative design in the hope of developing that concept into a more effective solution to the problem. However, while some of the inadequacies perceived in the preceding concept will now be resolved, some will still remain and others will have been introduced. Later perception of these inadequacies may prompt further conceptual reorientations.

These nine propositions collectively describe creative design as a process of cumulative development punctuated by disruptive reorientations. However, the opportunity to progress from one episode to the next—and to do so repeatedly—is determined by the resources available (e.g. time) and other contextual factors (e.g. motivation). Consequently, any particular project may be entirely constrained to a single period of cumulative design, or may be punctuated by one or more disruptive episodes. These disruptions may also vary in scope, sometimes involving large-scale revolutions in which the entire problem-solution is re-conceptualized, and sometimes involv-

36 Kuhn, "Reflections on My Critics," 243; Kuhn, *The Structure of Scientific Revolutions*, 208; Thomas S. Kuhn, "Comments on the Relations of Science and Art," in *The Essential Tension: Selected Studies in Scientific Tradition and Change* (Chicago: University of Chicago Press, 1977), 348. It is elsewhere claimed that the historical development of art, and also of design, craft, and technology practices can be described in terms similar to those used to describe the development of the natural sciences. For art, see Koestler, *The Act of Creation*, 252, 396; for design, craft, and technology, see Stephen Toulmin, *Human Understanding* (Oxford, UK: Clarendon Press, 1972), 364. Hafner exploits this similarity by using Seuphor's comments on modern art to describe the public's view of science, and also Kuhn's account of scientific revolutions to describe changes in artistic perception. See Hafner, "The New Reality in Art and Science," 390; Michel Seuphor, *Abstract Painting* (New York: Dell, 1964).

37 Kuhn, "Reflections on My Critics," 249–50.

38 Barnes, *T. S. Kuhn and the Social Science*, 15.

39 Wes W. Sharrock and Rupert J. Read, *Kuhn: Philosopher of Scientific Revolution* (Cambridge: Polity Press, 2002); Thomas Nickles, *Thomas Kuhn* (Cambridge: Cambridge University Press, 2003), 1.

40 Eugene Garfield, "A Different Sort of Great-Books List: The 50 Twentieth-Century Works Most Cited in the Arts & Humanities Citation Index, 1976–1983," *Essays of an Information Scientist* 10, (Current Comments 16, 1987), 101–5.

41 Martin Seymour-Smith, *The 100 Most Influential Books Ever Written: The History of Thought from Ancient Times to Today* (Secaucus, NJ: Citadel Press, 1998); also see "The Hundred Most Influential Books since the War," *The Times Literary Supplement* (October 6, 1995).

42 For Kuhn's views on the differences between the natural and social sciences, see Kuhn, *The Structure of Scientific Revolutions*, x, 162–63; and Thomas S. Kuhn, "The Natural and Human Sciences," in *The Road since Structure.*

ing only relatively small-scale shifts in how the purpose, process, or product is regarded. Furthermore, episodes of reorientation may be confined to a single individual, or may be distributed across various stakeholders in the design process. Despite these variations in the frequency of reorientation, its scope, or its distribution, in following Kuhn's arguments it is suggested here that the general structure of creative design progress follows the basic pattern outlined above.

Further Work

This article has drawn on *The Structure of Scientific Revolutions* to propose an account of creative design progress. Despite any similarities that might be found between episodes of scientific progress and those of creative design, Kuhn was essentially intending to describe different phenomena than those that have interested us here. There are consequently aspects of Kuhn's account that are not relevant to the study of creative design, and in particular, he placed special emphasis on issues of incommensurability and narrative reconstruction. Such concepts have not warranted discussion here, and no propositions have been derived from them. However, these concepts and many other aspects of Kuhn's work may be of interest to design scholars attending to other topics, especially those interested in the history of designed objects, and the practice of design research and design education.[66]

This article has argued generally for some connection between scientific discovery and creative design, but we have been limited to exploring the work of only one science scholar—Thomas S. Kuhn. If analogies between scientific discovery and creative design are considered useful, then future work might also benefit from accounts of scientific progress provided by other scholars. Of particular note are Popper's proposed system of conjectures and refutations and Feyerabend's notions of counter-inductive moves.[67] Viewing creative design progress through the various lenses that these and other scholars offer may lead to accounts that support, refine, or challenge those offered here. Whichever of these might occur, attending to work from the well-established and intellectually attractive field of philosophy of science can be expected to yield valuable contributions for design theory.

While there is benefit in using the philosophy of science to develop theoretical accounts of design, it might also be used to inform the planning of empirical studies. For example, we have seen here how viewing creative design episodes through a Kuhnian lens can yield a number of interesting propositions. Such propositions might then be used as the basis for a number of empirical studies that seek to establish the prevalence, determinants, and impact of the described phenomena. These investigations might employ a variety of well-established creativity research methods, including retrospective self-report, controlled experimentation, and protocol analysis. Such work could provide greater insight into the nature of creative

43 For general comments on Kuhn's impact on the social sciences, see Barry Barnes, *T. S. Kuhn and the Social Science* (New York: Columbia University Press, 1982); Steve Fuller, *Thomas Kuhn: A Philosophical History for Our Times* (Chicago: University of Chicago Press, 2000), 1. For application to particular disciplines see, for example, Alfred W. Coats, "Is There a 'Structure of Scientific Revolutions' in Economics?" *Kyklos* 22:2 (1969), 289–96; Allan R. Buss, "The Structure of Psychological Revolutions," *Journal of the History of the Behavioral Sciences* 14:1 (2006), 57–64.

44 For example, see Don Tapscott and Art Caston, *Paradigm Shift: The New Promise of Information Technology* (New York: McGraw-Hill, 1993); Christian Grönroos, "Keynote Paper: From Marketing Mix to Relationship Marketing—Towards a Paradigm Shift in Marketing," *Management Decision* 35:4 (1997), 322–39; Ikujiro Nonaka, Katsuhiro Umemoto, and Dai Senoo, "From Information Processing to Knowledge Creation: A Paradigm Shift in Business Management," *Technology in Society* 18:2 (1996), 203–18.

45 It is worth noting that in comparison to the work of his peers, Kuhn's book is relatively short and accessible, and written in a quite poetic rather than strictly logical manner. Furthermore, Kuhn's book is a comparatively open text that permits or inspires a wide variety of interpretations. In acknowledgment of this, Kuhn stated that: "Part of the reason for its success is, I regretfully conclude, that it can be nearly all things to all people." See Thomas S. Kuhn, "Second Thoughts on Paradigms," in *The Essential Tension*, 293. For a more critical socio-historical explanation of Kuhn's impact, see Fuller, *Thomas Kuhn*.

design in general, and more specifically into how different aspects of creative design progress are related.

In addition to assessing the fidelity of the account provided here, there is also promise in studying what effect an awareness of that account has on design practice. For example, researchers might prime designers with a Kuhnian perspective on creative design and observe what effect the anticipation of conceptual reorientation has on its occurrence. One possibility is that designers would be encouraged to consider any particular perspective on the design problem to be productive while also recognizing it as partial, contingent, and temporary. Phenomena such as "fixation" or "conceptual lock" might therefore be effectively guarded against if designers were to more readily anticipate and accept the disruptive influence of reorientation. Empirical work could potentially determine whether this effect is realized or whether some other unanticipated effect occurs.

Conclusions

This article began by stating that two perspectives on creative progress predominate in the design literature. On the one hand are those accounts that emphasize the effect of sudden insights, and on the other hand are those that emphasize gradual and cumulative change. Unfortunately, these different perspectives have largely existed in mutual isolation or are presented in mutual opposition. In contrast, this article has sought to show that these two perspectives can not only coexist, but should actually be combined. Sudden insights are prompted by—*and resisted because of*—the periods of incremental development that precede them. Each type of episode can only be understood in relation to the other because they are interdependent.

With reference to Kuhn's account of scientific advance, a series of propositions have been developed that characterize periods of cumulative design and episodes of conceptual reorientation. It is contended here that taken as a set, these propositions can sensitize researchers to interesting phenomena that are not emphasized by existing accounts. It is also contended that these propositions can sensitize designers to the structure of creative design progress and thereby aid reflective practice. Future work may be conducted to examine the validity of the propositions presented here, and also the utility they offer to researchers and designers. However, if this article only serves to stimulate interest in the structure of creative progress *in design*, or the promise that Kuhn and other philosophers of science hold *for design*, then this present project will have been worthwhile.

46 For example, see Terence Love, "Philosophy of Design: A Meta-Theoretical Structure for Design Theory," *Design Studies* 21:3 (2000), 295; Terence Love, "Constructing a Coherent Cross-Disciplinary Body of Theory About Designing and Designs: Some Philosophical Issues," *Design Studies* 23:3 (2002), 352; Martin Stacey and Claudia Eckert, "Against Ambiguity," *Computer Supported Cooperative Work* 12:2 (2003), 179; Marco Cantamessa, "An Empirical Perspective Upon Design Research," *Journal of Engineering Design* 14:1 (2003): 3; Kees Dorst, "Design Problems and Paradoxes," *Design Issues* 22:3 (2006), 15; Ipek Ozkaya and Ömer Akin, "Requirement-Driven Design: Assistance for Information Traceability in Design Computing," *Design Studies* 27:3 (2006), 383. For a more extensive consideration of paradigms in design research see Kees Dorst. "Describing Design: A Comparison of Paradigms," PhD Thesis, Delft University of Technology, 1997; Derrick Tate and Mats Nordlund, "Research Methods for Design Theory" (paper presented at the Proceedings of ASME Design Theory and Methodology Conference, Pittsburgh, PA, 2001 [DETC2001/DTM-21694]).

47 This approach, however, is not without its critics. For example, see Trevor J. Pinch and Wiebe E. Bijker, "The Social Construction of Facts and Artefacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other," *Social Studies of Science* 14:3 (1984): 407, 437.

48 Philip Anderson and Michael L. Tushman, "Technological Discontinuities and Dominant Designs: A Cyclical Model of Technological Change," *Administrative Science Quarterly* 35:4 (1990), 604–33. Also see Michael L. Tushman and Philip Anderson, "Technological Discontinuities and Organizational Environments," *Administrative Science Quarterly* 31:3 (1986), 439–65. For a related perspective in design research see Jerome Jarrett and P. John Clarkson, "The Surge–Stagnate Model for Complex Design," *Journal of Engineering Design* 13:3 (2002), 189–96.

49 Edward W. Constant, *The Origins of the Turbojet Revolution* (Baltimore: Johns Hopkins University Press, 1980), 10–19; Giovanni Dosi, "Technological Paradigms and Technological Trajectories: A Suggested Interpretation of the Determinants and Directions of Technical Change," *Research Policy* 11:3 (1982): 152–53.

50 Vincenti, *What Engineers Know and How They Know It*, 7–8. Vincenti acknowledges that the term "revolutionary design" might be more historiographically consistent, but he uses the term "radical design" because it implies something less extreme and more in line with engineering terminology, ibid., 260.

51 Warren K. Wake, *Design Paradigms: A Sourcebook for Creative Visualization* (New York: John Wiley & Sons Inc., 2000), 266–71. For a different use of the term "design paradigm," see Henry Petroski, *Design Paradigms: Case Histories of Error and Judgment in Engineering* (Cambridge: Cambridge University Press, 1994).

52 For an exception, see John S. Gero and Mary Lou Maher, *Modeling Creativity and Knowledge-Based Creative Design* (Hillsdale, NJ: Lawrence Erlbaum Associates, 1993), 63. Here, Kuhn is cited to support the contention that what is deemed creative will be determined by society. This might be in reference to comments such as the following: "as in political revolutions, so in paradigm choice—there is no standard higher than the assent of the relevant community." Kuhn, *The Structure of Scientific Revolutions*, 94.

53 Dasgupta, *Creativity in Invention and Design*, 21, 215; Subrata Dasgupta, *Technology and Creativity* (Oxford: Oxford University Press, 1996), 7.

54 Dasgupta, *Design Theory and Computer Science*, 141–42.

55 Dasgupta, *Creativity in Invention and Design*, 8; Dasgupta, *Technology and Creativity*, 52, 84.

56 Dasgupta, *Creativity in Invention and Design*, 208–9.

57 Kuhn, *The Structure of Scientific Revolutions*, 15.

58 Ibid., 52.

59 Ibid.

60 Ibid., 52–53.

Appendix

To illustrate the rather abstract summary of Kuhn's thesis offered in the main text, an historical example is provided here in which the important features of a scientific paradigm shift can be identified. Kuhn supported his arguments with examples drawn from various scientific disciplines, including Lavoisier's discovery of oxygen, Dalton's invention of atomic theory, and Maxwell's work on electromagnetism. However, we will restrict ourselves to an example from the history of astronomy, in particular, the transition from a geocentric to a heliocentric cosmology. This has the advantage of being a generally well-known scientific advance and of involving episodes that can rightly be regarded as design activities.[68] "The Copernican Revolution" and its aftermath are therefore outlined below, both to clarify the salient features of Kuhn's thesis and also to provide a reference for the propositions developed in the article.

For approximately 1400 years, Man's conception of his place in the cosmos was dominated by an astronomical model proposed by Ptolemy in the first century AD. This held that the Earth was the fixed center of the universe and that the moon, planets, and stars rotated on a number of concentric spheres. Difficulties in achieving a good match between predicted celestial movements and those that were observed led to the development of a complicated Ptolemaic system that involved placing the planets on an ever increasing number of epicycles ("wheels within wheels"). This geocentric system was eventually challenged in the 16th century by Copernicus, who proposed a heliocentric model, with the Earth and other planets orbiting the Sun, and the moon orbiting the earth.

Although Copernicus' model brought us closer to our present understanding of the solar system, he preserved the circular orbits required by Aristotelian dogma. For that reason and others, his model was initially more complex in its details than the well-refined Ptolemaic system with which it was competing. In the century and a half following Copernicus' death, Brahe made more precise observations of the heavens, Kepler defined the nature of elliptical orbits, Galileo developed the law of inertia, and Newton the law of universal gravitation. All these contributions refined the Copernican system into a logically coherent and comparatively precise astronomical model. This model guided observation and theory for over 200 years until Einstein published his work on relativity in the early twentieth century.[69]

In Kuhnian terms, these developments in the history of astronomy would be described as a long period of normal science (the refinement of the Ptolemaic system) that eventually suffered from mounting crises (complications and inaccuracies).[70] A rival paradigm was then proposed (the Copernican system) which was at first resisted (on ideological and technical grounds) but which eventually prompted a paradigm shift (including numerous conceptual reorientations). The articulation and refinement of the

new (heliocentric) system constituted another period of normal science. Eventually this too was challenged by an alternative candidate paradigm (Einstein's), one that promised to resolve some of the still existing anomalies (e.g., the advance of the perihelion of Mercury).[71]

61 Ibid., 122.
62 Ibid., 111.
63 Ibid., 64.
64 Ibid., 155–56.
65 Ibid., 79.
66 For comments on the role of education in fostering creativity, see Thomas S. Kuhn, "The Essential Tension: Tradition and Innovation in Scientific Research," in *The Essential Tension*, 237–39.
67 Karl R. Popper, *The Logic of Scientific Discovery* (London: Hutchinson, 1959); Paul Feyerabend, *Against Method: Outline of an Anarchistic Theory of Knowledge* (London: Humanities Press, 1975). For suggestions that Popper provides an appropriate foundation for studying innovation, see Reginald Shareef, "A Popperian View of Change in Innovative Organizations," *Human Relations* 50:6 (1997): 655–70. For Popper's relevance to design see Greg Bamford, "From Analysis/Synthesis to Conjecture/Analysis: A Review of Karl Popper's Influence on Design Methodology in Architecture," *Design Studies* 23:3 (2002), 245–61.
68 Kepler and his contemporaries conceived of the astronomers' task as involving artifice rather than just technical accomplishment. They constructed plans and models of their cosmologies in imitation of the design that they imagined "the Divine Architect" had created. See Nicholas Jardine, "The Places of Astronomy in Early-Modern Culture," *Journal for the History of Astronomy* 29:1 (1998): 53–56.
69 Thomas S. Kuhn, *The Copernican Revolution* (Cambridge: Harvard University Press, 1957); Arthur Koestler, *The Sleepwalkers: A History of Man's Changing Vision of the Universe* (London: Hutchinson, 1959); Jacob Bronowski, *The Ascent of Man* (Boston: Little Brown & Co, 1976).
70 Although Kuhn believed that the Ptolemaic system was in crisis, this point is debated elsewhere by his critics. See Hanne Andersen, Peter Barker, and Xiang Chen, *The Cognitive Structure of Scientific Revolutions* (Cambridge: Cambridge University Press, 2006): 4–5.
71 Kuhn, *The Structure of Scientific Revolutions*, 68–75, 116, 154–56.

About One Striped Rectangle: Jean Widmer and the Centre Pompidou Logo

Catherine de Smet

Translated by John Cullars

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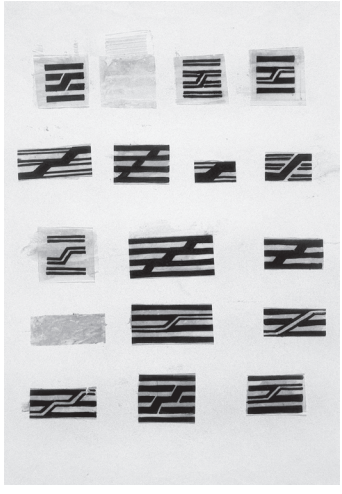


Figure 1
Jean Widmer, Sketches for the Centre Pompidou logo, 1976–1977.
29.7 cm (11.6 in) x 21 cm (8.2 in)
India ink on tracing paper and collage on paper, felt pen and pencil on tracing paper.
Paris: Musée national d'art moderne – Centre de création industrielle, photo Centre Pompidou/G. Meguerditchian

Memento Mori

Recently, it came very close to being admitted to the pantheon of defunct logos: the emblem of the Centre Pompidou, conceived in 1977 by Jean Widmer, was almost included in a funerary homage imagined by Declan and Garech Stone (the Stone Twins), whose book *Logo R.I.P.* commemorates 48 visual identities of the twentieth century that have fallen into disuse.[1] Like the BP shield, the Pan Am globe, and the Nazi swastika, Widmer's stripy design—a silhouette of the Centre (built by Renzo Piano and Richard Rogers)—might have been given a detailed obituary and a proper "burial." In addition to brief historical accounts, the book features photographs of tombstones, on which each logo appears as having been engraved—thanks to photo retouching software that allows such verisimilitude. These logos, condemned by the movement of history, economic exigencies, or marketing strategies, have thus been given immortality.

Logo R.I.P. highlights the paradox of signs, which are conceived as lasting symbols of an organization or a brand and generally designed to make a strong impression on public consciousness, but are nonetheless fragile, and liable to fade into total oblivion as quickly as they appear. Moreover, this virtual—and anachronistic—cemetery is more than just a happy artifice by which the apt-named Stone Twins offer an unhoped-for immortalization to each fallen logo. The fiction of these carved tombstones effectively places the signs in question into an historical perspective: it attaches them, most unusually, to the epigraphical tradition, the official inscriptions of which have, over the centuries, found a privileged sphere of expression precisely in funerary art.[2]

The heritage of the modern logo is at once vast and heterogeneous, a mixture of heraldry and identifying marks or signatures of all sorts used in diverse contexts throughout the centuries. The problem of strictly defining and categorizing them remains unresolved. The French word "logotype" was a typographical coinage that designated a set of letters cast in a single block of moveable type. Taking account of this original meaning, hesitation persists today in using the term in specialized literature when referring to signs that don't employ typography.[3] The abbreviated

term "logo," stripped of its suffix and gaining a more general application, has gradually come to designate (in both English and French) any sign, graphic and/or typographic (the two registers often coexisting) that identifies an organization or trademark. This is the usage adopted in the present essay.

The Stone Twins, Irish designers based in Amsterdam, indicate in their book that they had intended to include the Centre Pompidou logo in their selection but had to omit it when it "reappeared after years of inactivity." We don't know if the logo's tombstone would have been shown as neglected and invaded by undergrowth—like that of British Telecom's flute player—or fresh and flowery like the Reuters Agency's dotted letter sign, but this anecdote, even if based on a somewhat distorted view of reality, shows the attention paid by foreigners to the singular destiny of the Pompidou logo. The version given by the Stone Twins doesn't really correspond to the facts: there wasn't exactly "inactivity" or a "reappearance" of the Centre Pompidou emblem. It was threatened with disappearance at the end of the twentieth century but saved by an effective, notably international campaign. The eventful history of this striped, two-color rectangle thus emerges, after nearly 30 years of existence, as a kind of contemporary saga where aesthetic and ideological stakes have been intertwined.

Far from resting in peace, the logo is still today an integral part of the visual identity of the Centre Pompidou, even though it doesn't appear systematically on all official communications.[4] Its use became optional, at the recommendation of "image guidelines" drawn up by the Paris agency Intégral Ruedi Baur et Associés when the Centre reopened in 2000 after a period of major reconstruction. Those guidelines referred to the logo as a *sigle* [initial letter or acronym used as shorthand], just one among many identifying marks.[5] There are those who would have preferred to see it go: since the reconstruction of the Centre coincided with a new millennium, the elimination of the historic emblem would have marked a new direction. It ultimately survived due to strong pressures from within and without the Centre, but with a less assured position than before. But by delegating decisions regarding its use to those who conceive documents and other graphic objects, the image guidelines nevertheless ensured the logo's eventual return.[6]

The Necessity of Design

It is appropriate to go back to the creation of the Centre Pompidou emblem to understand the weight it carries today. It is even necessary to begin the story well before its appearance on the scene. In 1974, Jean Widmer and Ernst Hiestand won the competition to design the graphic image of what was then provisionally called the Centre Beaubourg. Five years earlier, Widmer had been asked by François Barré (associate of François Mathey, the director of the Union Centrale des Arts Décoratifs (UCAD)), to design the graphic

1 Declan and Garesh Stone, *Logo R.I.P.: A Commemoration of Dead Logos* (Amsterdam: Bis Publishers, 2003).

2 See Armando Petrucci, *Jeux de lettres: Formes et usages de l'inscription en Italie, XIe-XXe siècle* (1986), translated from the Italian by M. Aymard (Paris: Éditions de l'EHESS, 1993).

3 See, for example, Per Mollerup, *Marks of Excellence: The History and Taxonomy of Trademarks* (London and New York: Phaidon, 1997), 109. Mollerup points to an alleged distinction sometimes made between "logotype," which applies to longer and easily readable brand names, and "logo," which corresponds to shorter names, acronyms, or abbreviations. He adds, however, that the two terms are often used interchangeably to designate graphic symbols identifying trademarks, including those containing no alphabetical elements.

4 On the history of the visual identity of the Centre Pompidou, see Catherine de Smet, "Archéologie d'une identité visuelle," *Centre Pompidou: trente ans d'histoire* (Paris: Éditions du Centre Pompidou, 2007), 472–480.

5 On the visual identity conceived by Intégral Ruedi Baur et Associés, see especially Intégral Ruedi Baur et Associés, *00/00/00: Identité Visuelle du Centre Pompidou* (Paris: Jean-Michel Place, 1999).

6 The new functional signage progressively installed by the Paris agency CL Design in 2007 (to replace what Intégral Ruedi Baur et Associés had conceived) reintroduced various versions of Widmer's logo—a motif silkscreened onto around 30 glass discs painted red and placed here and there among the paving stones of the piazza in front of the Centre, or on the background of the permanent bulletin boards outside the building and in the hall.

look for the brand new Centre de Création Industrielle (CCI, founded to promote design), of which he was both the co-founder and the head.

The CCI image was actually among the earliest logos that Widmer designed, following two trademarks for ready-to-wear clothes.[7] His agency went on to create visual images for numerous institutions: in Paris alone, the Musée d'Orsay (with Bruno Monguzzi), the Institut du Monde Arabe, the Jeu de Paume, the Cité de la Musique, the Bibliothèque Nationale, and the Théâtre de la Colline. Having moved to France in 1953 at age 24, Widmer was originally from the German sector of Switzerland. Trained at the Schule für Gestaltung in Zurich, headed at that time by Johannes Itten, he belonged to a generation that benefited from direct links to the Bauhaus and the New Typography. Widmer worked first in Paris as an apprentice for the Tolmer firm, which specialized in package design. He then became art director for SNIP, an advertising company, then for the Galeries Lafayettes (as successor to his compatriot Peter Knapp), and finally for the magazine *Jardin des Modes*. Elsewhere, he gave courses at the École Nationale Supérieure des Arts Décoratifs, where he would participate in teaching reform from 1960 onward.

Conceived programmatically, the CCI's graphic look marked a turning point in Widmer's career; at a time when he was opening his own agency, this first global institutional image would definitely shape his later activities. But it was equally a turning point in graphic design in France, notably in the public sector, which would henceforth be more attentive to what François Barré called the "necessity of design."[8] This would be shown in various competitions in the following decades, beginning with that of the Centre Beaubourg.[9] The logo that Widmer created for the CCI and the graphic system into which it fit exploited a "constructive" repertoire along the lines of Max Bill and Richard-Paul Lohse, based on orthogonal axes, controlled composition, and a restricted visual vocabulary. Thus it helped familiarize the Parisian public with Swiss graphic design, a regulated, objective, measured approach that lent itself to the elaboration of broad-scale visual projects.

The twenty or so posters Widmer created for the CCI between 1969 and 1975 manifested a desire to establish as nonfigurative a relationship as possible with the announced subject of each exhibition, and depended on a pattern determining once and for all the position of the various elements (title, motif, descriptive text).[10] Such rational design was prolonged with the use of a single, sans-serif typeface, Helvetica, emblematic of Swiss know-how and high typographical standards. The oft-used fluorescent colors, which attest to Widmer's interest in Pop Art,[11] were also subject to previously established guidelines defining specific shades. The logo itself was made up of geometric forms—a half circle, evoking a C, linked to a smaller square with rounded corners. The result

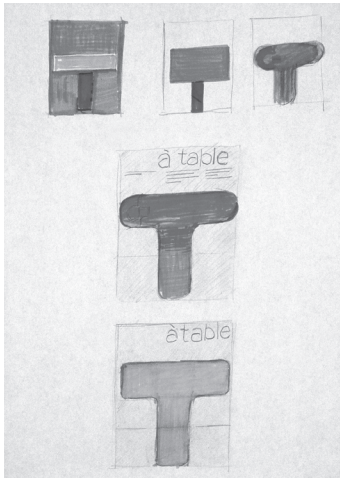


Figure 2 (top)
Jean Widmer
Sketches for the exhibition poster *À table*, 1969. 29.7 cm (11.6 in) x 21 cm (8.2 in)
Felt pen and pencil on paper.
Paris: Musée national d'art moderne – Centre de création industrielle, photo Centre Pompidou/G. Meguerditchian

Figure 3 (bottom)
Jean Widmer
Poster for the *À table* exhibit, CCI, Marsan Pavilion, 1970. 65 cm (25 in) x 50 cm (19.5 in)
Silkscreen
The CCI logo appears on the left part of the cross of the T.
Paris: Musée national d'art moderne – Centre de création industrielle, photo Centre Pompidou/J.-C. Planchet

obviously suggests the letter G: a G for graphic arts but also for *Gestaltung* (German for "giving form to"), a G that triumphantly occupied the covers of the journal of which it was the title, published in Berlin from 1923 to 1926 by El Lissitzky, Werner Graeff, and Hans Richter in the spirit of the Dutch De Stijl movement and Russian Constructivism. When questioned on this subject, however, Widmer denied ever having had such intentions, thus obliging to consider this G—so suited to what the CCI was championing—as a serendipitous slip of the pen.[12]

The mastery that Widmer demonstrated in his conception of a coherent global graphic image for the CCI, which could be adapted in the long run for multiple uses, put him in a privileged position when the embryonic Centre Beaubourg launched an international competition in 1974—a little less than three years before its opening—for the design of its visual identity. Such an operation on so grand a scale was an event in France, in which the CCI directly participated as one of four major institutions—with the Musée National d'Art Moderne (MNAM), the Bibliothèque Publique d'Information (BPI), and the Institut de Recherche et de Coordination Acoustique/Musique (IRCAM)— comprising the future cultural establishment. Indeed, during the previous five years, the CCI had contributed to making the French art scene sensitive to the problematics of design—graphic design in particular. Among exhibitions devoted specifically to that field, it is worth recalling those on the American Push Pin Studio and André François (both 1970), current Swiss graphic design (1971), Roman Cieslewicz (1972), and Dutch graphic designer Willem Sandberg's work for the Stedelijk Museum (1973), which Sandberg had headed for almost two decades (1945–63). Furthermore, other shows had accorded a sometimes important role to graphic design, placed in a larger context, such as the Olivetti exhibition in 1969 and the "French Design" show in 1971. They were presented in the Marsan Pavilion of the Louvre—the headquarters of the Union Centrale des Arts Décoratifs—or else, for larger installations, in Baltard's market pavilions at Les Halles (temporarily converted prior to demolition). That was the case in 1970–71 for the exhibition "Collective Spaces: Signage and Furnishings," which provided a pointed reflection on what was at stake concerning commissions for graphic design on the municipal scale. An important part was devoted to issues of urban signage: an audiovisual display allowed the public to compare the graphic design choices of the subway systems of seven large world cities, and a section was devoted to the exemplary signage system created in Mexico City by a multidisciplinary team led by Lance Wyman for the 1968 Olympic Games.

International Consultation

Several of the designers included in the 1970–71 exhibition were solicited for the 1974 competition. The operation was launched in

7 Logos of Pierre d'Alby and Vêtements de vacances (VdeV) in 1963 (Widmer had already designed the title of the magazine *Jardin des Mode*s in 1961).

8 François Barré, "La nécessité du design," *Prisuvente* 25 (January 1970): 4–5. (This issue served as the catalogue for the exhibition organized by CCI: "International Competition of Prisunic-Shell Design.")

9 See Josée Chapelle and Marsha Emanuel (eds.), *Images d'utilité publiqu*e (Paris: Centre Georges Pompidou, 1988), which features various graphic arts commissions between 1970 and 1980.

10 For a detailed description of the composition of the posters and the CCI logo, see Margo Rouard (ed.), *Jean Widmer: Un écologiste de l'image* (Paris: Centre Georges Pompidou, 1995), 57.

11 See Jean Widmer's conversation with Philippe Apeloig in the catalogue of the exhibition *Jean Widmer: A Devotion to Modernism.* (New York: Herb Lubalin Study Center of Design and Typography / Cooper Union School of Art, 2003), 38-39.

12 I asked Jean Widmer the question in public at the time of the lecture I gave in his presence at the Centre Pompidou on February 29, 2004.

May with a message sent to about twenty agencies or independent designers, divided fairly equally between French and foreign agencies or designers. The letter sent out by Robert Bordaz, president of the Etablissement Public du Centre Beaubourg (EPCB), pointed out that it was not really a conventional competition but rather a consultation of "qualified experts," whose opinions were sought to define the Centre's "image."[13] The recipients of the letters were informed of the names and positions of the members of the commission charged with the final decision, namely the president of EPCB and the heads of the four institutions: Pierre Boulez (director of IRCAM), Pontus Hulten (head of the visual arts department), François Mathey (director of CCI), and Jean-Pierre Seguin (director of BPI). The role of Chair was bestowed on Willem Sandberg, who was a particularly appropriate choice due to his double experience as a designer and a former director of a major European museum,[14] as well as being Francophile and fluent in French. A planning schedule indicated the different stages of the work to be carried out in cooperation with the Centre's teams and the architects Renzo Piano and Richard Rogers between July 15 1974 (the date of the final selection), and January 1, 1976 (the date set for the public opening of the building). Then the contributions to be supplied by the candidates were set out in detail. In addition to the names of the members of the agencies and of potential associates and professional references, the letter indicated that submissions should include a document explaining the manner of "approaching, treating, and resolving the principal problems of signage for Beaubourg," as well as a "note on the resources to be deployed." On the other hand, no design proposal was specifically required, and the visual aspect of the dossier seemed optional: "You may, if you wish, complete this document with an illustration of your conceptions (thus, for example, a proposed 'Beaubourg label' or one or more sketches)." Candidates were also given a brief that divided the issue into two "series of problems." On the one hand, there were questions concerning access to the Centre (not very visible at a distance) and movement inside the building (taken in a very broad sense, from guiding visitors to labeling artworks), and on the other, there were questions concerning the Centre's "image" and public visibility.

Despite the varied profiles, differing nationalities, and ages of those invited to participate in the competition, all had experience, at different levels and degrees, in the issues addressed by this consultation: the visual identity of a museum or institution and the problematics of signage for public spaces. Perhaps the sole exception was André François, more an illustrator than a designer. He made a joint submission, however, with the agency of Robert Delpire, who, in association with the American Herb Lubalin, had recently led (as his response to the Centre pointed out) "similar investigations for different projects, in particular for the World Trade Center in New York."

13 This letter, as well as other documents from the EPCB cited in this article relating to the competition, are housed in the archives of the Centre Pompidou.

14 In 1971, Sandberg had been one of the nine members of the jury for the Centre's architecture competition, which was won by Renzo Piano and Richard Rogers.

The list included, for example, designers of the visual image for the Olympics, Lance Wyman (Mexico 1968) and Otl Aicher (Munich 1972). Also solicited was Italian-American designer Massimo Vignelli, a proponent of vast visual branding, who notably designed new signage for New York's subway in 1972. Ivan Chermayeff and Thomas Geismar, meanwhile, were specialists in grand-scale corporate design projects, such as the one their agency conceived for Mobil Oil Company; in 1964 they also created a new visual image for the Museum of Modern Art in New York. The Dutch designer Wim Crouwel and his Total Design partners were known for both the signage at Schipol Airport (Amsterdam) and publicity materials for the Stedelijk Museum. One of the numerous works that the British designer Alan Fletcher of the Pentagram collective had to his credit was the dotted logo for Reuters Press Agency (mentioned above), with its necessarily international application. His senior colleague, Frederik H. K. Henrion, a pioneer of British corporate design, had published a book on the subject a few years before,[15] while the London firm Wolff-Olins had been recognized as an international specialist in trademark images since its founding in 1965. The Belgian Michel Olyff had been featured in the CCI exhibition thanks to his work on highway signage. Pierre Faucheux, who had spearheaded the graphic renewal of books in France in the late 1940s and was especially well known in the publishing sphere, had also worked on architectural projects and had designed the logo for Paris's Musée des Arts et Traditions Populaires, as well as various exhibition designs.

Also invited to submit were Marc Piel from Paris (with the ENFI Design firm), Basel-based designer Théo Ballmer (who designed a temporary logo for the Pompidou Centre, consisting of a circle in a square), the naturalized Frenchman Roman Cieslewicz from Poland, and Bob Noorda, a Milanese designer originally from the Netherlands. The designer of the celebrated Univers typeface Adrian Frutiger, then active in Paris (drawing up signage specifications for the new Roissy Airport) made a joint submission with Leen Averink. Finally, Jean Widmer joined up with Ernst Hiestand, his compatriot from Zurich. Some individuals and agencies declined the invitation to submit, such as the French agency Mafia (which lacked the "necessary teams," according to Denise Fayolle in her letter to the committee), Chermayeff and Geismar (who cited a heavy workload and reduced office staff), and Massimo Vignelli. Jacques Lavaux and Michel Bilic (VB Production) had agreed to submit, but did not appear on the final list. In all, fifteen competitors remained in the running.

The dossiers submitted by the candidates were forwarded to four designated committee *rapporteurs*, all involved in the initial conception of the Centre: the architects Dominique Baudry and Henri Bouilhet and the sociologist Claude Pecquet (all three of whom were members of the planning team), as well as François

15 Frederick H. K. Henrion, Alan Parkin, *Design Co-Ordination and Corporate Image* (London: Studio Vista and New York: Reinhold, 1968).

Barré. Engineering chief François Lombard presided over this "technical commission," which included the Beaubourg architects Piano and Rogers, whose advice was solicited. A duly prepared analysis in the form of a questionnaire guided committee members in their task of paring down and determining numerous aspects for the jury to consider in making its decision. The conclusions of the reporters' review, however, did not finally agree with the terms of the preliminary guidelines, which were probably unsuited to submissions that were less ample than expected. The optimistic preparatory document betrayed ambitious expectations on the part of EPCB, including graphic proposals (which were nevertheless optional, according to the commissioning letter cited above); we may imagine a certain degree of disappointment with responses that were sometimes a bit undeveloped. So the contents of the submissions were described as "a letter" from Cieslewicz, a "letter and a slide" from André François, and only a "written document" from Frutiger. A note on Wolff-Olins's submission indicates "no concrete proposals." Seven of the competitors gave no costs, and nine of them didn't furnish anything related to "functional signage." Approaches to the issue of signage generally appeared "good" or even "very good" except for Olyff, Cieslewicz, Frutiger, and François, all of whom received poor marks ("nothing" or "no") in the categories relating to methodology and implementation. Budgetary estimates were difficult to compare since the number of phases varied from case to case, but Widmer's seemed the most expensive—1,760,000 francs,[16] a figure that caused the committee to ask whether it included the cost of execution. It appears that the average cost predicted by EPCG had been one million francs, with no compensation allotted for the competition itself.

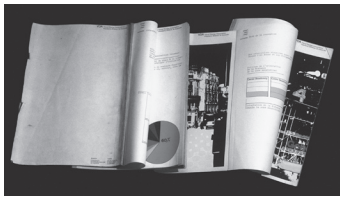
At its first meeting, the selection committee short-listed five teams: Otl Aicher, Lance Wyman, Alan Fletcher and Theo Crosby, Jean Widmer and Ernst Hiestand, and Pierre Faucheux. On July 5, Widmer and Hiestand were definitively selected. The official report of the jury's deliberations stated that "the committee noted the high quality of the dossiers that were submitted to it." This claim was doubtless mere courtesy, judging by the information already quoted and especially by an article dealing with the competition that appeared in the magazine *CREE*, whose author Gilles de Bure, before describing the level of the presentations as "frankly bad," stated that "one must say that the average level of analysis and presentation (with very few exceptions) was unusually poor."[17] This critical evaluation of the results of the competition supplies some information on the contents of some of the proposals.[18] We learn, for example, that Cieslewicz, working with Roland Topor and Fernando Arrabal, proposed a logo based on three combined letters: A for Art, B for Beaubourg, and C for Centre, and that Marc Piel's approach was very marketing-based. De Bure also reported that many candidates insisted on exploiting audiovisual media,

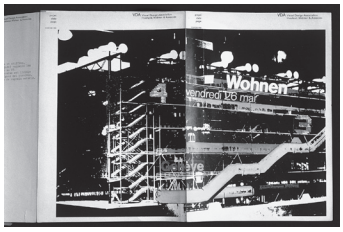
16 According to the notes concerning costs as indicated by the candidates. The total for that outer cover is also confirmed by the article cited in the following footnote.

17 Gilles de Bure, "Signalétique pour le Centre Georges Pompidou," *CREE* 36 (August-September 1975): 47–53.

18 There are now no traces of returned documents for the competition in the archives of the Centre or the Musée National d'Art Moderne collection.

employing multiple screens and loudspeakers in accordance with the concept of "machines for communication" being promoted by Piano and Rogers, and that the Dutch designer Wim Crouwel suggested accentuating audio messages so as to facilitate the orientation of visitors, especially the blind. But the article offered a particularly detailed consideration of the descriptive signage designed by Visual Design Association (VDA), a collective structure created by Widmer and Hiestand, which eventually became (without Hiestand) Visual Design. It was now late 1976, about 18 months after the competition. The Centre was no longer called Beaubourg but Georges Pompidou; construction was in full swing, and the VDA team was working on the final touches of its project.





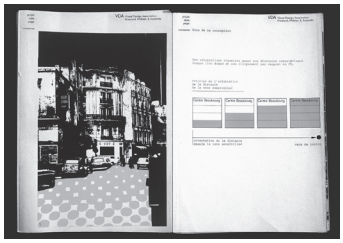


Figure 4 (top)
Visual Design Association (Jean Widmer and Ernst Hiestand)
Proposal submitted for the competition to design the descriptive signage for the Centre Beaubourg. July 1974.
Accordion-fold document, 42 cm (16.3 in) x 29.7 cm (11.6 in) (closed)
Jean Widmer Collection, photo Centre Pompidou/G. Meguerditchian

Figure 5 (middle)
Ibid.

Figure 6 (bottom)
Ibid.

No Logo

The document with which VDA won the competition in 1974 was a thick pad of A3-size photographic paper printed on one side only and tied together with cloth ribbons so that it could be opened and spread out over more than 32 feet. Viewing it therefore required special spatial conditions. The designers wanted to offer the jury an object adapted to simultaneous examination by many individuals, permitting all the members present to read part of the dossier without losing sight of it as a whole. Widmer and Hiestand were surrounded by a solid team, including two Swiss colleagues, Urs Franger (who wrote the text with Hiestand) and Jörg Zintzmeyer, as well as the colorist Jacques Fillacier and two graphic designers, Nicole Sauvage and Robert Krügel. The introduction had been assigned to a museum specialist, the Swiss Jean-Christophe Ammann.

VDA submitted a detailed analysis of the process of gaining admittance to the Centre, and suggested a strong urban signage system based on an identifying color—yellow—with bills posted throughout Paris, signs on the ground near the building, and glowing signs (by artist Piotr Kowalski, among other potential contributors). The façade would be exploited as a surface for information on the Centre's activities, as the architects had wished. To illustrate their design, Widmer and Hiestand wove a story around two characters, Signor Mazzola, a head technician at a Milanese industrial firm, and Monsieur Hulot, who lived in a French provincial city and was married and a father of three. So the public visibility of the Centre Beaubourg was described in great detail through the eyes of visitors who approached it progressively, from publicity brochures at a travel agency prior to their departure right up to their arrival on the premises.

Among "problems to be resolved," formulated for the sake of the competitors, the EPCB very baldly asked, "Is a logo required for Beaubourg? If not, what would you recommend?" VDA responded very plainly: no logo, no symbol. On this point, the winners didn't differ much from the other competitors, who were almost unanimous

on this subject. Although the issue of descriptive signage was the order of the day, converging with the very fashionable trend of "environmental design,"[19] logos were in a state of crisis. Just six years after May 1968, logos were thought of as a marketing ploy and viewed as ideologically contemptible, totally at odds with the ambition of a public institution with a cultural mission. Even when it came to the image of companies with business goals, the notion of a trademark was the object of lively criticism. Already in 1967, the American designer Jay Doblin had ironically emphasized that in order to learn to read logos it was necessary to know at least 3000 different signs—a task as complex, he pointed out, as familiarizing oneself with Chinese ideograms. Doblin, who had formerly worked with Raymond Loewy and co-founded (with Vignelli, Eckerstrom, and Noorda) the design firm Unimark International two years before, knew what he was talking about. Owning up to his own illiteracy in the matter, he then risked the provocative hypothesis of the total uselessness of such symbols. Total wastes of time and money—rumor had invoices rising to $100,000—they could even be obstacles to the prestige of the enterprises they were meant to enhance. Concluding his iconoclastic diatribe, Doblin suggested abandoning logos to their fatal perversity and adopting typography instead: "A little Helvetica lower case lettering can get the job done."[20] In that spirit, Chermayeff and Geismar had chosen Franklin Gothic for New York's Museum of Modern Art. This American sans serif typeface was designed at the beginning of the twentieth century, and its use in writing the museum's name sufficed to guarantee the museum's visual identity. (The contractions MOMA, and later MoMA, came about only later.)[21] The solution that VDA proposed followed that trend but with a typeface expressly conceived for the Centre.

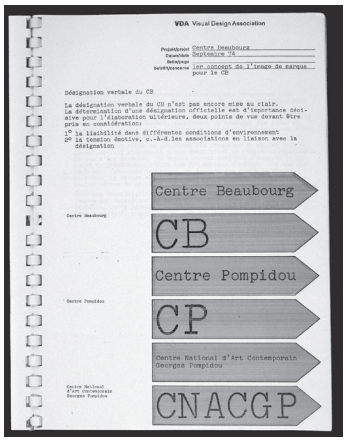
The values carried by Piano and Rogers's architectural concept were themselves opposed to any fixed, overly developed image, which would freeze the identity of a project that was entirely vested in circulation, flux, and the transmission of multiple kinds of information. As Gilles de Bure put it in his article, the project should be "kinetic" or nothing at all. Moreover, another difficulty complicated the situation: "Although Beaubourg should have descriptive signage that characterizes it as a totality, it is composed of discrete parts with their own separate identities [MNAM, BPI, IRCAM, CCI]. Over-emphasizing the diversity would be bad in that it would give the public the impression that the Centre was only a conglomeration of heterogeneous activities. On the other hand, a rigorous quasi-military uniformity would conform poorly to the diversity of the Centre. If a logo or symbol is envisioned for the Centre, how should this symbol translate the concept of diversity within unity?"[22] Faucheux replied with a composite patchwork logo; VDA proposed a combination of two identifying elements—for unity, a single typeface; and for diversity, a simple color code distinguishing each entity via a specific

19 See Edward K. Carpenter and Martin Fox, *The Best in Environmental Graphics* (The Print Casebooks Series). (Washington DC: RC Publications, 1975); *Environmental Design: Signing and Graphics* (Los Angeles: Security Pacific Bank, 1977); *Graphics on a Large Scale* (Tokyo: Seibundo Shinkosha, 1979); John Follis and Dave Hammer, *Architectural Signing and Graphics* (New York: Whitney Library of Design, 1979). In France, the Conseil Supérieur de la Création Esthétique Industrielle published a series of studies on architectural signage in various domains—transport, leisure, industrial and hospital areas—between 1974 and 1976.

20 Jay Doblin, "Trademark Design," *Dot Zero* 2 (1967), reprinted in *Looking Closer 3*, ed. by Michael Bierut, Jessica Helfand, Steven Heller, and Rick Poynor (New York: Allworth Press, 1999): 180–86.

21 The logo for the New York Museum of Modern Art, created in 1964 by Chermayeff and Geismar, which replaced an emblematic signature composed in a modernist alphabet, remained unchanged until the building was extended in 1984. The enlarging and renovating of the museum by the architect Yoshio Taniguchi occasioned new considerations of its graphic image. Invited to propose various types of renovation, the Canadian designer Bruce Mau nonetheless recommended keeping the logo as it was. He suggested, however, redesigning the type, that version of Franklin Gothic having undergone inevitable deformations from typefont to online design throughout successive uses. The typographer Mathew Carter was originally commissioned to redesign a Franklin Gothic typeface more in line with the original conceived in 1902 by Morris Fuller Benton. See Andrew Blum, "The Modern's Other Renovation," *The New York Times*, September 21, 2003.

22 A note addressed to the persons consulted, already cited in the text.



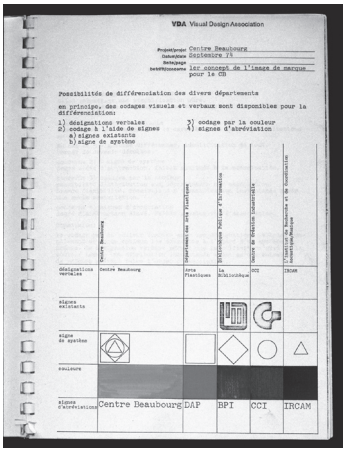


Figure 8 (left)
Visual Design Association (Jean Widmer and Ernst Hiestand). First concept for the Centre Beaubourg logo, September 1974. Booklet, 29.7 cm (11.6 in) x 21 cm (8.2 in). Paris: Musée national d'art moderne – Centre de création industrielle, photo Centre Pompidou/G. Meguerditchian

Figure 9 (right)
Ibid.

color. A third element would characterize all publicity material, from signs to letterheads: a verticality of written information.

The matter of the logo, dismissed by VDA, was nonetheless far from being decided. "Opting for a descriptive logo," claimed the text that VDA submitted for the competition, "would mean fixing Beaubourg in the present moment at the risk of its going out of fashion," whereas the firm's recommended solution would "inscribe Beaubourg in history." In spite of these arguments and the effectiveness of the proposed system that did without a logo, those in charge at EPCB asked Widmer and Hiestand to develop ideas for a possible emblem. In the fall of 1974, VDA presented the results of their recent investigations. Their document (*The 1st Concept of the Trademark Image for the CB*) listed "the possibilities for differentiating among various departments," which included a set of symbols: a triangle for IRCAM, a circle for CCI, a diamond for the library, and a square for the plastic arts, all geometric forms that could fit together to constitute a single figure. VDA's objective, however, as Widmer recalls now, was to convince doubters of the pointlessness of such a system, which would be redundant with the color coding. Their persuasion was eminently successful: symbols were dropped from the plan of action, and VDA began work according to its initial proposal.

"The Centre Beaubourg is neither a bank nor an airport nor a grand hotel," pointed out the document originally sent to the competitors. Even if some details should be refined, they shouldn't be taken "too far." The Centre aimed above all to be "at the service of diverse categories of the public (especially the young) interested in intellectual and artistic pursuits." The signage system and its supports "should be carefully done, precise, and effective" while at the same time appearing "simple and unaffected." Such were the characteristics of the system developed by Widmer and Hiestand. The typeface, intended to play a unifying role by serving for all channels of communication (internal as well as external), reflected the reality of the day: a typewriter face, which was an appropriate

23 When it came to both visual image and descriptive signage, VDA's recommendations were not faithfully executed. There were numerous reasons for this: the resistance of some departments (which were little inclined to adopt a common graphic vocabulary), logistical difficulties, or again, in the case of signage, problems with the functionality of the system, especially the color coding and the verticality of the inscriptions. Ten months after the opening, an English-language magazine published a critical commentary on the graphic vicissitudes of the Centre Pompidou, Alastair Best's "Why the People Stay Away from a People's Culture Center," *Design* 354 (June 1978): 50–54.

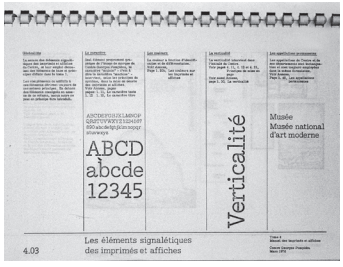
24 *L'Express*, January 31–February 6, 1977, 16–26.

25 Commission dated November 18, 1976 for a one-time fee of 20,000 francs, including transfer of all rights.

26 Michel Pastoureau, *The Devil's Cloth: A History of Stripes and Striped Fabric*, translated by Jody Gladding (New York, Columbia University Press, 1991): 5.

choice to embody the notion of communication at that time. VDA turned to a model from IBM that had not yet been marketed, which was then developed by Adrian Frutiger, whose collaborator Hans-Jürg Hunziker would later join the Centre's team so as to insure the existence of an internal graphic arts group able to carry out the VDA project. The typeface was christened with the name of the institution that it represented, and was variously called Beaubourg or CGP. However, an unanticipated event thwarted the use of the character in correspondence: the Centre's contract for the supply of typewriters went to a company other than IBM, an incompatibility that would limit the use of the Beaubourg face to materials printed by outside firms.

In March 1976, VDA produced a *Signage Manual* made up of four independent booklets that described the system and defined the practical rules for different types of orientation, correspondence, documents, and posters. Five colors distinguished the Centre's departments—yellow for administration and activities (such as publicity and publishing), red for the Musée National d'Art Moderne (MNAM), blue for the CCI, green for the BPI, and purple for IRCAM. The choice of colors was based on the principle of the equal distance separating each one on the color wheel. But since the purple proposed for IRCAM profoundly displeased its director, a different shade was chosen. The three-dimensional signage system and printed materials fulfilled the same criteria—thin vertical bands on which the names of departments or services were inscribed in white against the appropriate color. This was the system that the public encountered after the inauguration in January 1977. A charming joke circulated then, inspired by the reputed difficulty in reading the 90-degree lettering on the panels—a large number of pedestrians were henceforth walking through Paris with heads bent to one side, following a visit to the Centre. The CGP face was used everywhere, from signposts to publications, including the two-line signature of the institution itself—"Centre Georges Pompidou" above "Centre National d'Art et de Culture" in a smaller font, but still no logo.[23]



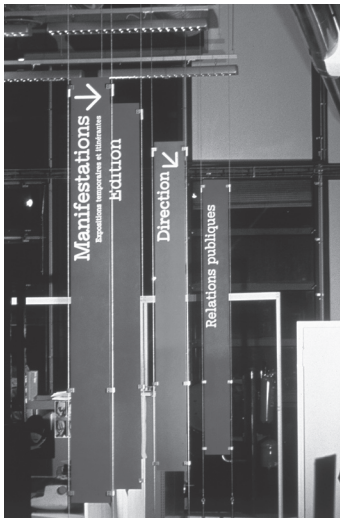
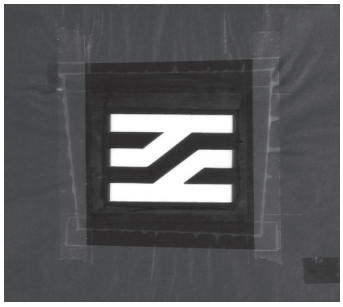


Figure 10 (top)
Visual Design Association (Jean Widmer and Ernst Hiestand) *Les éléments signalétiques des imprimés et affiches.* (Signage elements for printed matter and posters.) *The last of four volumes of Manuel signalétique* (Signage Manual), March 1976, 21 cm (8.2 in) x 29,7 cm (11.6 in). Paris: Musée national d'art moderne – Centre de création industrielle, photo Centre Pompidou/G. Meguerditchian

Figure 11 (bottom)
Jean Widmer
Signs for the Centre Pompidou, Department of the
Centre de création industrielle, 1977.

Stripes

Although the first appearances of the striped emblem were during the Centre's inaugural period, it wasn't yet part of the Centre's visual identity. At the beginning of 1977, it had just been designed and it led an independent, reserved, and confused existence. It was used, for example, in a special issue of *L'Express* devoted to the opening.[24] It was reproduced in various places on its own without any connection to other elements of the guidelines. (Those guidelines, for that matter, were closely followed on the letterhead of the stationery with which Secretary General Claude Mollard commissioned Widmer to design an emblem.)[25] Indeed, VDA had not yet carried the day, and just a few weeks prior to the opening some people felt that the need for the logo was more pressing than ever. A response wasn't slow in



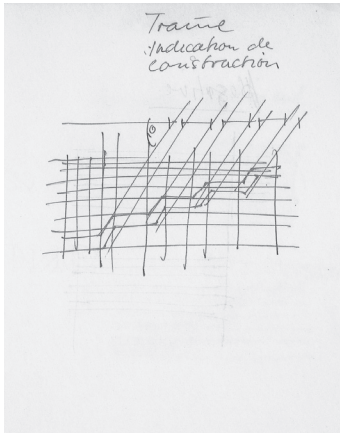


Figure 12 (top)
Jean Widmer
Sketch for the Centre Pompidou logo, 1976-1977
India ink on tracing paper and collage on paper, 21 cm (8.2 in) x 29.7 cm (11.6 in)
Paris: Musée national d'art moderne – Centre de création industrielle, photo Centre Pompidou/G. Meguerditchian

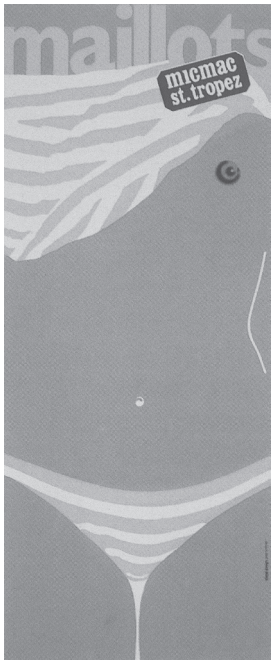
Figure 13 (bottom)
Jean Widmer
Sketch for the Centre Pompidou logo, 1976-1977 21cm (8.2 in) x 14.5 cm (5.6in) (format : unfolded document : 29.7 cm (22.6 in) x 21 cm 8.2 in)
Ink on paper. Paris: Paris, Musée national d'art moderne – Centre de création industrielle, photo Centre Pompidou/G. Meguerditchian

coming—eleven stripes of equal width, stacked one above the other, alternately black and white (or other background color) forming a rectangle crossed by a twelfth band that zigzagged from the lower left to the upper right corner. Thus one of the most successful logos and most striking examples of graphic design in France in the second half of the twentieth century was produced for the sake of compromise by a designer who thought it superfluous.

The sketches for this logo, inspired by the building's architecture, testify to research totally in keeping with the Swiss "constructionist" tradition. Widmer took the façade with its escalator as a model but interpreted and simplified it so as to obtain a synthetic visual identity. This visual approach was related to the concrete art trend, particularly the concrete art of Zurich developed in the early 1940s, which had a profound impact on Widmer's education. Once again, we have the principle of an orthogonal grid, an anonymous feel, flat treatment, and the absence of any distinction between the foreground and background, all of which characterized the paintings of Max Bill, Richard Lohse, Verena Loewensberg, and Camille Graeser. However, there was one deviation from concrete orthodoxy: the resulting emblem had a somewhat figurative quality, from which Widmer had nevertheless sought to distance himself. In fact, he had tried to establish the number of horizontal bands not as a representation of the actual levels in the building but as a function of an equilibrium proper to the emblem itself. Pressure on the part of some of those in authority who wanted the logo to reflect the five floors of the building thwarted Widmer's desire for abstraction.

It is worth noting that unlike most architecture-inspired symbols, this one doesn't sketch the outlines or suggest the building's volume. The image was inspired by the façade but remains an open figure without lateral edges, thus manifesting a structure rather than a precisely defined form. In this sense, it calls to mind an heraldic model—the two-color division of the surface into superimposed horizontal bands of the same width, as well as the diagonal band that partially intersects them all, belongs to the geometric vocabulary of coats of arms. Being a striped surface, this logo can support all variations of scale and fulfill its role as a sign devoted to multiple usages. Conceived simultaneously as a functional graphic element (within the distant tradition of heraldry) and, as mentioned above, as a direct heir of concrete art, the Centre's emblem also reflected a more directly contemporary aesthetic. Its stripes connect it to Op Art and make it a "kinetic" sign that alone is able to overcome the paradox of a signature that permanently defines the identity of a constantly evolving place and project.

In his book *The Devil's Cloth,* Michel Pastoureau indicated that **"**[a] stripe doesn't wait, doesn't stand still.**"** As a dynamic surface structure, it is "in perpetual motion," which is why Pastoureau feels that stripes have always fascinated artists.[26] Widmer's logo thus maintains formal affinities with the works of numerous artists,



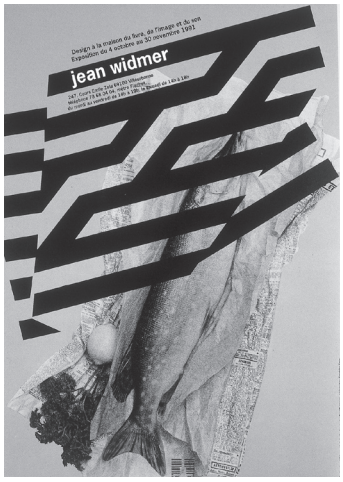


Figure 14 (top)
Jean Widmer
Poster for *micmac* bathing suits, 1976.
Collection Jean Widmer: photo Centre Pompidou/J.-C. Planchet

Figure 15 (bottom)
Jean Widmer
Poster for the *Jean Widmer* exhibition, Maison du livre, de l'image et du son, Villeurbanne, 1991. 70 cm (27.3 in) x 50 cm (19.5 in)
Collection Jean Widmer : photo Centre Pompidou/J.-C. Planchet

from Martin Barré and Daniel Buren to Donald Judd, to cite only a few names represented in the collection of the Musée National d'Art Moderne. A work contemporary with Widmer's logo, *Échelles optométriques* by Raymond Hains (a great lover of stripes, fences, Venetian blinds, and other such bar-codes), even suggests to people fond of unusual experiments what the logo would look like if seen through fluted glass. Stripes recurred in Widmer's productions across the years, and we might even detect a perhaps remote but no less delightful genetic ancestor to the Centre's logo in the rumpled tee-shirt in a 1976 ad for "Mic Mac St. Tropez" bathing suits.

Widmer was personally interested in the potential visual transformation of the Centre's emblem. For his 1991 exhibition at the Maison du Livre et de l'Image in Villeurbanne, he experimented with citing it in three different ways, subjecting it to different operations of fragmentation, partial enlargement, and unusual superimposition. The poster features it in destructured form, broken at the ends, plastered over a photo of a dead fish lying on newspaper; the invitation, like the cover of the catalogue, reproduced only some inordinately large sections of it. Only the fame of the logo allowed for such an attack on its formal integrity without imperiling its recognition by the public, and this artificially casual gesture invited viewers to appreciate the evocative power of the sign in question, recognizable even though broken up or cut into pieces. The following year, Widmer again put his logo on display in a similar perspective for a Pompidou Centre exhibition entitled "Manifesto"—thirty years of creativity that drew on the museum's permanent collections. The striped image appeared here as a hasty sketch, drawn on a support that was itself a part of a photographic still life. A stack of irregularly drawn lines formed a limp rectangle, doubly disfigured by the fold of the paper on which it appeared and by the transgressive use of color distinction, not respecting the alternation of stripes, instead creating an unexpected division into left/right. Juxtaposed with works or details of works in the museum's collection—the still life exists in several different versions—the institutional emblem, although present in such a modest, unsolemn, detached self-quotation, directly evokes its participation not only in the thirty creative years in question but also in the Centre's heritage, of which this "Manifesto" presented a kind of retrospective.

A few years later, in 1998, the logo appeared again in distorted form on a printed document—an activist pamphlet—but this time it wasn't Widmer's work. "Don't let the logo go!" was the slogan accompanying the alarmist depiction of the emblematic rectangle falling apart. A triangular "highway danger sign" headed the explanatory text: "We have learned that the logo, the vehicle for the image of the Centre Pompidou, which has carried its reputation worldwide, is threatened with 'rehabilitation'….The employees, the public, and those who work in the arts are indignant about this outrage…. Join us!" A fax number was provided to which to send

Figure 16
Jean Widmer
Generic visual for advertising
Basic visual design for the *Manifeste* exhibit, 1992, Paris: Centre Georges Pompidou, photo Centre Pompidou/J.-C. Planchetphoto Centre Pompidou/G. Meguerditchian

protests.[27] Obviously, the word had gotten out about the efforts of Ruedi Baur to find a new visual emblem for the Centre. There were rumors of a redesign of the logo or even of its total suppression. Some people feared that Jean-Jacques Aillagon, President of the Centre, would more than welcome that idea. So there was an uproar. A logo's age has no importance, Paul Rand, himself the creator of the now imperishable stripes on the IBM emblem, underlined the point: "Quality, not vintage or vanity, is the determining factor."[28] Throughout 1999, the press reported this campaign, which also found an echo in the international professional community,[29] thanks to the Alliance Graphique Internationale. A great deal of mail opposing the elimination of the celebrated emblem reached the desks of the Minister of Culture Catherine Trautmann and the President of the Centre. Its heritage value, visual quality, and symbolic effectiveness were unanimously invoked. The unpopularity of the project grew because of the absence of transparency in how it was being executed. A graphic arts operation of that magnitude should have required an official public procedure; the designer appointed by the architect to redo the functional signage (part of the budget for renovating the building) suddenly found himself charged with redoing the logo (not part of the initial plan). People were equally astonished that Renzo Piano, legitimately commissioned to renovate a building he co-designed, didn't respect this same principle by placing the logo issue into the hands of the original designers.

Between 1977 and 1998, the original VDA image had already undergone many modifications, and Visual Design hadn't always received the commission to design these different transformations. But Widmer was nevertheless responsible for the evolution of the Centre's signature emblem, which he orchestrated over the years by combining the logo with the CGP typeface.[30] Both these elements were officially "preserved" in the proposal ultimately submitted by Intégral Ruedi Baur et Associés, and are today subjected to new rules. The CGP face, initially excluded from internal documents for technical reasons, as mentioned earlier, is henceforth comfortably housed, being the typeface used on almost all of the Centre's computers. The computers are furthermore graced with a reproduction of the emblem as a flag flying in the wind when the screens are in sleep mode. These are minor applications, perhaps, but at least they respond to concerns expressed by staff in the years prior to the reopening in 2000, reflecting an attachment to this visual logo and thus demonstrating its unifying role.

The Centre's external publicity materials henceforth use a very different typeface than CGP,[31] but often exploit the option of incorporating the logo. Furthermore, the logo has never ceased appearing as the imprint on works published by the Centre. The marked vitality of this symbol thus excluded it from the Stone Twins' graveyard of a book; indeed, it has enjoyed a certain fame in specialized literature, which attests to the international notoriety

justly claimed for it by its defenders during 1998–99.[32] Among the reasons for its longevity is its completeness as a sign: at once a portrait (of a remarkable building), an imitation imprint (it looks as though it was made by an inked rubber stamp) and an abstract symbolic image (thanks to highly suitable visual simplification). The future of this striped rectangle, unwanted by its creator and yet admirably conceived, rich in paradoxical and exemplary history, remains open. Whatever the case, it has amply demonstrated its ability to survive.

27 Undated document.

28 Paul Rand, "Logos, Flags, and Escutcheons," *AIGA Journal of Graphic Design* 9:3 (1991), reprinted in *Looking Closer: Critical Writings on Graphic Design*, ed. By Michael Bierut, William Drentell, Steven Heller, and D. K. Holland (New York: Allworth Press, 1994): 88–90.

29 "Centre Pompidou: le logo à la trappe" *Designfax*, December 14, 1998, p. 1; Brice d'Antras, "Le logotype du Centre Pompidou, est-il obsolete?" *Étapes Graphiques* 47 (January 1999): 66–67; Philippe Quinton, "Changer de logo?" *Étapes Graphiques* 48 (February 1999): 67–69.

30 The CGP typeface has subsequently been through modifications—larger boldface and digitization—conducted under the supervision of Hans-Jürg Hunziker. On this topic, see Catherine de Smet, "Archéologie d'une identité visuelle," *op.cit.*, 476-77.

31 The typeface in question is DIN Engschrift (DIN: Deutscher Industrie Normen, a system of standardization established in Germany in the mid-teens of the twentieth century). The DIN Engschrift face was notably used for the number plates of cars. The visual identity of Espace 315 on the mezzanine of the Centre Pompidou, conceived in 2004 by Frédéric Teschner, exploited a typewriter face distinct from CGP: Prestige Elite.

32 See, for example, Per Mollerup, *op. cit.*, 140; Benoît Helbrunn, *Le Logo* (Paris: PUF, "Que Sais-je?", 2001): 93–95; Richard Hollis, *Graphic Design: A Concise History* (New York: Thames and Hudson, 2002): 197-198, Alan and Isabella Livingston, *The Thames and Hudson Dictionary of Graphic Design and Designers* (New York: Thames and Hudson, 1998): 203-204; Anne-Marie Sauvage, "Les arts graphiques," *Arts contemporains 1950–2000* (Paris: Autrement, 210); Roxane Jubert, *Typography and Graphic Design: From Antiquity to the Present* (Paris: Flammarion, 2006): 350; Michel Wlassikoff, *The Story of Graphic Design in France* (Corta Madera, CA: Ginko Press, 2005): 242 . Aside from the two last works cited, the logo is generally inaccurately dated 1974 instead of 1977.

Brand Styles in Commercial Design

Oscar Person and Dirk Snelders

Introduction

Style has long been an important concept for distinguishing the works of individual artists and classifying works of art and architecture into groups, schools, regions, and periods.[1] However, there is no reason why discussions of style should be limited to objects of art and architecture, excluding everyday objects of design, such as cars or shoes. As already noted by Alpers,[2] the art historian Heinrich Wölfflin pointed to similarities in style between Gothic cathedrals and Gothic shoes to illustrate that style extends beyond objects of art.[3] In fact, all human artifacts may be said to represent or exemplify characteristics of a style,[4] and historians and philosophers of art and architecture have often referred to everyday objects such as cars[5] and toys[6] when attempting to refine their classifications. However, with a few noteworthy exceptions,[7] everyday products made for commercial mass markets have seldom been discussed in the context of the treatment of styles in art and architecture.

In the product design literature, the style of new products was quickly recognized as an important subject, especially in relation to the market reception of new designs.[8] In addition, the skills associated with producing a style for a brand also have long been recognized in the management literature as a key contribution of design.[9] Still, both literatures (on product design and management) have only briefly addressed the historical and theoretical assumptions underlying the notion of brand styles in products. In general, styles are explained as invariant (formal) elements that represent a brand, both in individual products and across product ranges, but little is said about the origin of these elements or what they refer to. The cursory treatment of style in design and management may be linked to its elusive character.[10] At first glance, we may readily recognize and classify objects as representatives of one style or another. Yet, in the pursuit of a more general theory of style, the assumptions underlying our classifications tend to collapse under scrutiny.

In this article, we will discuss the notion of brand styles in commercial, mass-produced products as a concern for designers working for companies in competitive markets. Departing from earlier texts on style in art and architecture, we will discuss some of the current challenges with the concept of a brand style in design, and then explore a new conceptual framework that separates the production of brand styles from their reception in the market. Our contribution will be twofold. First, we will extend the art historical

1 Style is not the only concept used in art historical studies. Historians and philosophers of art and architecture are typically advocated to complement their studies on style with studies on the date, technique, function and significance of an object. Whitney Davis, "Style and History in Art History," in *The Uses of Style in Archaeology*, ed. Margaret Conkey and Christine Hastorf (Cambridge: Cambridge University Press, 1990), 19. By the same token, studies on style in design should not be perceived as isolated activities but as valuable contributions to studies on function, production, significance, use, etc.

2 Svetlana Alpers, "Style Is What You Make It: The Visual Arts Once Again," in *The Concept of Style*, ed. Berel Lang (Ithaca, NY: Cornell University Press, 1987), 139–40.

3 An electronic version is available at http://www.tu-cottbus.de/theo/D_A_T_A/Architektur/20.Jhdt/Woelfflin/Woelfflin_158.htm (accessed 10/2009).

4 Nelson Goodman, "The Status of Style," *Critical Inquiry* 1: 4 (1975): 808, George Kubler, "Style and the Representation of Historical Time," *Annals of the New York Academy of Sciences* 138 (1967): 854.

5 Ernst H. Gombrich, "Style," in International *Encyclopedia of the Social Sciences*, ed. David L. Sills (New York: The Macmillan Company & The Free Press, 1972), 354–55.

6 Ernest H. Gombrich, "Meditations on a Hobby Horse, or the Roots of Artistic Form," in *Aesthetics Today (Revised Edition)*, ed. Morris Philipson and Paul J. Gudel (New York: New American Library, 1980).

perspective to style production by applying it to commercial brand styles in product design. In particular, we will advance the view that the production of contemporary brand styles passes through various phases, each of which can be characterized by a particular perspective on the market differentiation of the brand in question. Second, we will follow the art historical argument that style attributions made during reception are subjective, employed rhetorically to further the interests of the critic. Applying this idea to style attributions of branded products—by consumers, designers, and the companies they work for—we will argue that brand styles can become an important vehicle for laying bare the interests of these various parties and opening up discussion among them about the actual and desired structural qualities of products.

Modern and Contemporary Problems with Brand Styles

In classifying objects by styles, art historians long relied upon a separation between form (how) and content (what) in works of art. Styles revealed themselves in the different ways the content of an artwork is expressed. Wölfflin, in a classic example, gave the anecdote of four friends who initially decided to paint the same landscape and "firmly resolved not to deviate from nature by a hair's breadth," but ended up with four totally different paintings.[11] According to Wölfflin, the disparity between the paintings represented a non-mimetic element of the artworks, in which the styles of the painters were expressed, unbound by the shared content of their work.[12] Such a view of style is also found in twentieth-century design, namely in the modernist division between form and function. In this view, stylistic decisions are apparent from the lavish decoration of a product's technical and/or utilitarian function.[13] Given the modernist ideal that there can be only one rational (and optimal) solution to any design problem, decisions regarding decoration were seen as redundant[14] and this typically positioned the concept of style outside the scope of design.[15] However, the modernist perspective on style has been questioned on several accounts. First, as noted by Forty, the modernists engaged in much debate about the underlying assumptions behind what would constitute a proper solution, implying that the expression of such solutions could differ.[16] Second, as summarized by Dormer, "The claim that use influences the shape and form of a product is not the same as the claim that use determines the final design."[17] Third, definitions of style are not limited to "decorations" of the form.[18] A case in point is that a style can equally be grounded in the "content" of objects as much as their "form."[19] Any structural quality of design, whether it pertains to the how or what of a product can be a constituent element of a style. In product design, the use of boxer engines over successive product generations may for instance be perceived as a prominent characteristic of the Porsche style, while the more decorative aspects of the form of the cars (such as the shape of the headlights) have varied over the years.[20]

7 See, for example, Erwin Panofsky, "The Ideological Antecedents of the Rolls-Royce Radiator," in *Three Essays on Style*, ed. Irving Lavin (London: The MIT Press, 1997).

8 See, for example, Geoffrey Holme, *Industrial Design and the Future* (London: The Studio Limited, 1934), 18–21, J. Gordon Lippincott, *Design for Business* (Chicago: Paul Theobald, 1947), 51–58, Harold van Doren, *Industrial Design: A Practical Guide to Product Design and Development*, 2nd ed. (New York: McGraw-Hill Book Company, Inc., 1954), 15–16, Harley J. Earl, *The Look of Things* (Detroit: General Motors Corporation / Dept. of Public Relations, 1955), Gregor Paulsson and Nils Paulsson, *Tingens Bruk Och Prägel* (Stockholm: Kooperative förbundets bokförlag, 1956), 113.

9 See, for example, Ben Nash, "Product Development," *Journal of Marketing* 1: 3 (1937): 257; P. Kotler and G. A. Rath, "Design—a Powerful but Neglected Strategic Tool," *Journal of Business Strategy* 5: 2 (1984): 18; J. A. Menge, "Style Change Costs as a Market Weapon," *Quarterly Journal of Economics* 76: 4 (1962).

10 Schapiro noted that "Styles are not usually defined in a strictly logical way.… the definition indicates the time and place of a style or its author, or the historical relation to other styles, rather than its peculiar features." Meyer Schapiro, "Style," in *Aesthetics Today* (Revised Edition), ed. Morris Philipson and Paul J. Gudel (New York: New American Library, 1980), 139.

11 Heinrich Wölfflin, *Principles of Art History: The Problem of the Development of Style in Later Art*, trans. M. D. Hottinger, Seventh ed. (Mineola: Dover Publications, Inc., 1950), 1–2.

12 For more information about the origin and legacy of this treatment of style in studies on art and architecture, see David Summers, "'Form,' Nineteenth-Century Metaphysics, and the Problem of Art Historical Description," *Critical Inquiry* 15: 2 (1989): 372–79.

The elusive character of style has fueled considerable debate among art historians over the years. During the latter part of the twentieth century, the apparent lack of agreement on style even made historians and philosophers actively distance themselves from the notion of style when analyzing objects of art and architecture.[21] Alpers, for instance, suggested avoiding the concept of style because it had been defined in so many ways that speaking about the style of objects led to more uncertainty than clarity.[22] But the recommendation to abolish the notion of style has not proven successful in art history or in design. On the contrary, it has led to the replacement of conventional style classifications with more elaborate descriptions, or to the substitution of the word style by other, equally elusive terms that only serve to cloud the issue.[23] In response to this "unavoidable" character of style, a number of historians and philosophers have sought to re-evaluate the concept of style, while still acknowledging its ambivalent character.[24] While the notion of style is "a highly conditioned and ambivalent hermeneutical 'construct' worked out at a distinct moment in social and intellectual history,"[25] it does not prohibit a degree of conceptual unity to its use when trying to describe and compare human artifacts of similar or different character.[26]

Similarly, designers have felt compelled to avoid the inherent ambiguity of style in theory and practice.[27] However, the notion of style seems intrinsically linked to how we seek similarities and differences between objects created by different designers and produced by different brands. For instance, we readily analyze and critique the styles of the past and comment on the styles of designers such as Karim Rashid or Philippe Starck. In many cases, we associate the style of a designer with a company brand. Eliot Noyes's typewriter designs have become associated with the style of IBM, and Jacob Jensen's stereo equipment with that of Bang and Olufsen. In the market, consumers may only have a vague awareness of designers, but they readily distinguish one brand style from another and attribute different designs to different brands based on considerations of style. Although there may be little agreement between expert historians in art, architecture, and design on what exactly should be included in the concept of style, the notion has survived its critics and is still used by experts and laymen alike.

With a renewed interest in the commercial role of design, the literature on design has begun to discuss how companies can gain a competitive advantage through brand styles.[28, 29] In many of these discussions, the focus is on establishing a distinct style to help consumers recognize the products of a particular brand. The major aim here is to locate tangible product attributes (shapes, colors, materials, etc.)[30] and to identify the meanings associated with these attributes.[31] The underlying idea is that designers can create brand recognition by replicating these attributes in the design of new products. Attempts have been made to capture the styles

13 For more in-depth discussions on the legacy of modernism in twentieth-century design theory and practice, see Peter Fuller, "The Search for a Postmodern Aesthetic," in *Design after Modernism: Beyond the Object*, ed. John Thackara (Thames and Hudson, 1988), François Burkhardt, "Design and 'Avant-Postmodernism'," in *Design after Modernism*, ed. John Thackara (London Thames and Hudson, 1986).

14 "True functional solutions were identical with true formal solutions: each and every function was meant to have one—and only one—solution proper to it, and, consequently, only one proper form." Jan Michl, "Form Follows What? The Modernist Notion of Function as a Carte Blanche," *Magazine of the Faculty of Architecture & Town Planning* 10 (1995): 25. An edited electronic version is available at http://janmichl.com/eng.fff.hai.html (accessed 10/2009.)

15 Arthur J. Pulos, *American Design Ethic: A History of Industrial Design to 1940* (Cambridge: The MIT Press, 1986), 402–3.

16 Adrian Forty, *Words and Buildings: A Vocabulary of Modern Architecture* (London: Thames & Hudson, 2000), 240–48.

17 Peter Dormer, *Design since 1945*, World of Art (London: Thames and Hudson Ltd, 1993), 55.

18 Schapiro, "Style," 139.

19 This point is examined by Goodman, who searched for styles in the expressive attributes of objects. "[S]tyle is not exclusively a matter of how as contrasted with what, does not depend on either synonymous alternatives or upon conscious choices among alternatives, and comprises only but not all aspects of how and what a work symbolizes." Goodman, "The Status of Style," 808.

of brands such as Buick, Dove, Volvo, and Nokia by identifying (and interpreting) reoccurring attributes of their branded products. However, the classification and interpretation of reoccurring product attributes is a risky venture when the underlying assumptions behind the notion of styles in products are only addressed in passing. A danger is that some important characteristics of brand styles and their meaning may be overlooked. This can happen for a number of reasons. First, some companies have established a style for their brand without replicating the attributes of their previous products. For example, almost immediately after the launch of the Apple iMac in 1998, journalists were referring to a distinct iMac style characterized by glossy translucent and candied colored plastic. Second, the perception of a brand style by a target group of consumers in the market can be heavily framed by what consumers already know about a brand. We can find products in the marketplace that share several product attributes, yet are not perceived as representing a single brand style. For example, the Swedish garden equipment producer Stiga has the same distinct color scheme and sturdy expression as the American heavy machinery producer Caterpillar, but their target consumers are unlikely to recognize a single brand style in the designs of the two companies. Third, the association of products with brand styles need not depend on particular concrete attributes that are repeated over the brand portfolio, but it can also be instantiated by similarities on a more abstract level. For example, many Alessi products express a similar type of playfulness through references to childhood that allow them to be classified to an Alessi style (or a specific time period of it), even though they do not share any concrete attributes. According to Alberto Alessi, the playful style of the company and its references to childhood symbolize an affective and potentially transitional quality of design.[32] This symbolic relation between particular designs and their meaning implies that a brand style does not need to incorporate specific design elements in each product, but can instead be established by reoccurring references to the brand style in a wide variety of concrete product attributes.[33, 34]

All in all, the current discourse on brand styles is confronted with the problem of where and how to search for tangible evidence of styles in products. In addition, there might be a problem of style attribution, in that the way that people ascribe the products of a brand to a style is contextual and depends on knowledge about the brand and its previous styles. In the remainder of this paper we will present a new perspective on the production and reception of brand styles as a response to these problems. This perspective will draw equally from past thinking about style in art, architecture, and design. But before turning to this, we will first look more deeply into the root of modern and contemporary problems with the concept of style.

20 Note that by describing a brand style in terms of the how (form) and what (content) of the designs of the products falling under a brand we temporarily suspend considerations about the why. To stay with the example of Porsche, many consumers know that most car models in Porsche's history had a boxer engine. This is also frequently mentioned in Porsche advertising and (sometimes sponsored) editorial content in car magazines. It can be said to be central to the brand's heritage and identity. However, this structural aspect of Porsche's car design is mentioned without ever explaining why the boxer engine would be a good solution. In fact, many car experts, and Porsche enthusiasts among them, think that a boxer engine in the back is not an ideal starting point for a sports car, and Porsche's history suggests that the choice of the boxer engine was perhaps more based on issues of availability, rather than of functionality. Randy Leffingwell and David Newhardt, *Porsche 911: Perfection by Design* (Osceola: MotorBooks/MBI Publishing Company, 2005), 32–74. Thus, the extent to which functions are part of a brand style is debatable, because even the central mechanical parts of a product that make up the function can be known by the market without being understood.

21 Jaś Elsner, "Style," in *Critical Terms for Art History*, ed. Robert S. Nelson and Richard Shiff (London: The University of Chicago Press, 2003), 98.

22 Alpers, "Style Is What You Make It: The Visual Arts Once Again," 137.

23 For example, academics and practitioners have argued for the importance of design/product languages to establish recognition in the marketplace for a company or designer, while often only briefly relating their discussions on what constitutes a design/product language to the extant literature on style. See, for example, Rune Monö, *Design for Product Understanding: The Aesthetics of Design from a Semiotic Approach*, trans. Michael Knight, 1st ed. (Stockholm: Liber AB, 1997), 104–8, 65.

Style and the Problem of Progression

We start our overview with Giorgio Vasari, who in the sixteenth century proposed an analogy between developments in styles and periods of human life in that both undergo transitions from infancy to old age and death. He believed that the greatest maturity in style existed in his own time, the Renaissance, fostered by the newfound wealth and grandeur of a number of Italian cities. In brief, the style of works of art and architecture was seen as the outcome of a development of the artist and/or the society he/she lived in. Adhering to an ideal that styles develop over time, the task of the art historian was "to decode the meaning, to uncover the principles lying behind the mute face of a work of art."[35] The art historian could make the past accessible for interpretation in the present through the style of an object, as that style was perceived as a direct outcome of personal as well as societal developments. In the nineteenth century, the "general" scheme of developments in styles was complemented by a Darwinian perspective, when terms such as "evolution" and "life" became common in discussions on style in art.[36] In product design, styles have also been discussed from a Darwinian perspective. Pye, for instance, argued that "so long as evolutionary changes in them [styles] continue, good design flourishes."[37] Another example is the metaphorical use of design DNA as the driving force behind the design attributes that convey a product's brand identity over product generations.[38] While there are theoretical differences between the "Vasarian" and the "Darwinian" perspectives in art history, both schemes were based on the ideal that styles improve over time, and that the improvements are tightly connected to personal and social progress.[39] This means that the style of an object could act as a sign of the time, readily interpretable by an art historian.

The ideal of style progression created a number of problems for art historians,[40] and some of these may also be encountered by designers when analyzing brand styles. The first problem with the ideal of progression in styles lies in its normative character. By explicitly stating, or implicitly acknowledging, that more advanced styles are preferable, some objects can be devalued only because of their apparently juvenile or primitive expression and/or deviation from a more advanced standard. For example, Karjalainen analyzed the history of Volvo, and found that the brand style of Volvo changed from a boxy style to a more muscular style over a range of models introduced during the 1990s. This change is seen by Karjalainen as a response to a growing need in the market for dynamic looking cars. However, fearing that consumers would no longer recognize the new style as typical of Volvo, the car designers added style features from curvier Volvo models from the 1950s and highlighted these references to previous models in their effort to promote the new Volvo style.[41] These retro-elements in the Volvo style support the view that changes in brand styles are not necessarily progressions.

24 See, for example, Caroline van Eck, James McAllister, and Renée van de Vall, *The Question of Style in Philosophy and the Arts*, ed. Salim Kemal and Ivan Gaskell, Cambridge Studies in Philosophy and the Arts (Cambridge: Cambridge University Press, 1995), Philip Sohm, *Style in the Art Theory of Early Modern Italy* (Cambridge: Cambridge University Press, 2001), Margaret Conkey, and Christine Hastorf, *New Directions in Archaeology: The Uses of Style in Archaeology* (Cambridge: Cambridge University Press, 1990).

25 Willibald Sauerländer, "From Stilus to Style: Reflections on the Fate of a Notion," *Art History* 6 (1983): 254.

26 Margaret Conkey and Christine Hastorf, eds., *The Uses of Style in Archaeology* (Cambridge: Cambridge University Press, 1990), 3.

27 When reflecting on the cursory treatment of style in product design, we also should not forget that design have sought to avoid being reduced to "[T]he wrapping of product in nice shapes and pretty colors", as a cynical designer describes the traditional role of designers as stylists within companies. Christopher Lorenz, *The Design Dimension: The New Competitive Weapon for Product Strategy & Global Marketing* (Oxford: Basil Blackwell Ltd, 1990), x.

28 See, for example, Mike Baxter, *Product Design: A Practical Guide to Systematic Methods of New Product Development*, 1st ed. (London: Chapman & Hall, 1995), 174–77, Monika Hestad, "Den Kommersielle Formen" (The Oslo School of Architecture and Design, 2008).

29 In the management literature, where design has always been viewed as a commercial instrument, the concept of style was never abolished, and was always connected to market differentiation through recurrent design features in products, set within a larger goal of positioning a brand in the market. See, for example, Philip Kotler, *Marketing Management*, International ed. (London: Prentice Hall International, Inc., 2000), 312.

A second problem with the ideal of style progression is that, in the case of art, the series of choices an individual takes to achieve a particular aim is unclear. The reason for this, as noted by Gombrich, is that the "aim of art . . . may shift, and what we take to be the end-point of a logical evolution may only look this way by hindsight."[42] He exemplified this claim by pointing to individual artists who seldom know what constitutes the next step in a logical progression. After all, if the artists knew the ultimate goal of their work, why would they not ignore the steps in between and more quickly reach the final aim of the style? Similar problems exist for brand styles in commercial design. A number of studies have examined changes in brand styles over time. McCormack, Cagan, and Vogel noted that the Buick style has been altered quite radically over the years, with many of the alterations responding to changes in technology, design philosophy, or control of the company.[43] Buick probably could not have foreseen many of these changes. Another example is the Apple iMac. When it was launched, Apple's designers presumably gave it a distinct style with the aim of generating attention in a market that had stagnated in terms of style. Later, when they extended the iMac style to other products (such as the iBook), they most likely did this to benefit from the positive connotations people had attached to the iMac. In other words, the aim that companies strive for in their designs can shift even within a single brand style and depends heavily on the continuously changing circumstances that a company finds itself in.

Finally, even if we allowed for the possibility that a brand style has a progressive and stable aim, it is often unclear what constitutes progression for a brand style. This depends on who is evaluating it. People's reactions to styles can differ widely,[44] and for this reason the designers' work on brand styles is tightly connected to the idea of market segmentation and product differentiation.[45] Thus, what is seen as advanced by some may be perceived quite differently by others, and various styles may be needed to achieve the same commercial aim among different groups of customers. This fact was already evident in 1754 when the London-based furniture maker Thomas Chippendale published *The Gentleman and Cabinet Maker's Director,* in which he marketed furniture in a variety of styles to fit the diverse home décor needs and wishes of potential clients.[46] A more recent example of how people's reactions to style can differ widely is found in the distinct style of the 1998 Fiat Multipla. The style's distinctiveness was celebrated by art critics and designers. Thanks to its distinct style, the Multipla was even granted a place in the Museum of Modern Art in New York during its "Different Roads—Automobiles for the Next Century" exhibition in 1999.[47] However, despite its "artistic" success, far from everyone liked the appearance of the Multipla. In fact, many people thought it was too controversial, and sales never really took off.[48]

30 M. Agarwal and J. Cagan, "A Blend of Different Tastes: The Language of Coffeemarkers," *Environment and Planning B: Planning and Design* 25 (1998): 205–226; J. P. McCormack, J. Cagan, and C. M. Vogel, "Speaking the Buick Language: Capturing, Understanding, and Exploring Brand Identity with-Shape Grammars," *Design Studies* 25:1 (2004): 1–29; M. J. Pugliese and J. Cagan, "Capturing a Rebel: Modeling the Harley-Davidson Brand through a Motorcycle Shape Grammar," *Research in Engineering Design-Theory Applications and Concurrent Engineering* 13:3 (2002): 139–156; Hau Hing Chau, "Preserving Brand Identity in Engineering Design Using a Grammatical Approach" (The University of Leeds, 2002); Anders Warell, "Design Syntactics: A Functional Approach to Visual Product Form" (Chalmers University of Technology, 2001).

31 Toni-Matti Karjalainen, "It Looks Like a Toyota: Educational Approaches to Designing for Visual Brand Recognition," *International Journal of Design* 1:1 (2007): 67–81; Toni-Matti Karjalainen, "Semantic Transformation in Design: Communicating Strategic Brand Identity through Product Design References" (University of Art and Design Helsinki, 2004).

32 Alberto Alessi, "The Design Factories: Europe's Industrial Future?," in *Alessi: The Design Factory*, ed. Meret Gabra-Liddell (London: Art & Design Monographs, 1994), 9–15.

The Production of Brand Styles

In seeking an explanation for changes in style in the arts that avoids the ideal of progression, Ackerman argued that changes style wise occur because of the balance between stability and change that intrinsically exists in how people solve problems.[49] Stable patterns of problem solving emerge due to factors such as tradition, accepted working techniques, and people's natural desire for continuity. Patterns change because of boredom, passion, and the human instinct to reject past practices and explore new technical, expressive, and representative challenges and solutions. Ackerman argued that in this problem-solving process "[a] style, then, may be thought of as a class of related solutions to a problem—or responses to a challenge—that may be said to begin whenever artists begin to pursue a problem or react to a challenge which differs significantly from those posed by the prevailing style or styles."[50] In doing so, Ackerman avoided the ideal of progression in styles by linking the origin of a style to the search for a solution to a problem or challenge.[51] If we apply Ackerman's definition to the design of mass-produced products, the expression of a brand style can be said to arise from a reoccurring set of solutions to a problem or challenge facing designers of branded goods.

Other authors have found that artists often test different solutions when seeking a solution to a problem or challenge. Schapiro noted that artists can express a number of different styles through their work, even during shorter periods of time.[52] Wollheim argued that the reason for this is that an artist may have realized a solution only incompletely or simply not found a solution for their current problem or challenge at hand.[53] Thus, not all the works of an artist (or a period) need necessarily be seen as the outcome of the same style and nor does each work need to be representative of that style to the same degree.[54] When combining these insights with Ackerman's definition of style and applying them to design, we can arrive at a synthesized view of brand styles, one that accounts for the rise of new brand styles and their persistence as well as variation among various product designs within a brand.

Like Wollheim's argument for art, design too has been described as a matter of trial and error, where "we have to make the things we have designed before we can find out whether our assumptions are right or wrong."[55] It is therefore not uncommon for designers to test a number of different solutions in the process of producing a brand style.[56] Designers also work within a corporate setting where the production of a brand style is synchronized with broader developments in the company and its market environment.[57] Thus, the designer is not limited by the repeated use of a solution to a distinct, previously unexplored problem or challenge facing a producer of branded goods. This implies that not all product designs of a brand should necessarily be seen as representative of a single style, or be seen as equally representative of that style.

33 In the literature on product semantics, styles are seen as important signs for meaning attribution, not only because of what they represent, but also because of what they can symbolize. See, for example, Susann Vihma, "Products as Representations—a Semiotic and Aesthetic Study of Design Products" (University of Art and Design Helsinki, 1995), 104–8. Steffen refers to styles as 'symbol complexes' of meanings which typically transcend the direct associations we derive from products. Dagmar Steffen, *Design Als Produktsprache: Der "Offenbacher Ansatz" In Theorie Und Praxis* (Frankfurt am Main: Verlag Form GmbH, 2000), 87–92. Likewise, in the management literature, a brand style is often recognized as an important sign for identifying and attributing (often allusive) meanings to a brand, including symbolic (or brand iconic) meanings. Douglas B. Holt, *How Brands Become Icons: The Principles of Cultural Branding* (Boston: Harvard Business School Press, 2004), 155–87. Note, however, that the assumptions underlying the notion of brand styles are only briefly touched upon in this literature.

34 In consumer psychology, abstract attributes are seen as a way of comparing products that share few concrete attributes, such as products from different product categories. Michael D. Johnson, "Consumer Choice Strategies for Comparing Non Comparable Alternatives," *Journal of Consumer Research* 11 (1984): 741–753.

35 Vernon Hyde Minor, *Art History's History* (New Jersey: Prentice-Hall, 1994), 131.

36 James S. Ackerman, "A Theory of Style," *Journal of Aesthetics and Art Criticism* 20: 3 (1962): 230.

37 David Pye, *The Nature and Aesthetics of Design* (London: Barrie and Jenkins Ltd., 1978), 134.

Another implication of this view on style production is that designers, or the companies they work for, might not be aware that they are designing products in a certain way. Some of the reoccurring solutions used when producing an object can be created habitually, and may therefore not be recognized as a solution by the producer(s) of a style.[58] However, in a commercial setting, heavy competition between different brands will also force producers to become more self-aware and create styles deliberately in order to differentiate their brand from other brands. With these intended styles, brands aim to forge a strong visual identity for their brand—one that can be easily recognized in the market and assure potential customers of the brand's inherent quality.[59, 60]

The development of (intended) brand styles may involve several phases. First, during a *search phase* a designer or design team may search for solutions to a new problem or challenge facing a producer. While searching, the designer can test out different solutions, sometimes for different products that are produced by the brand. During this phase, the designer benefits from traditions and accepted working procedures and may also refer back to earlier solutions that are implicitly or explicitly known to him or her.[61] We can for instance speculate about the degree to which Jonathan Ive, when designing the Apple iMac, was influenced by the glossy white and blue translucent plastic of the already existing Rowenta Surfline iron.[62]

A search phase can be followed by a *nurture phase* in which a company has settled on a set of solutions to a problem and then repeatedly asks its designer(s) to extend it to new products of the brand (as Apple extended the iMac style to the iBook). During the nurture phase, the brand style becomes more defined and more easily recognizable. By extending the brand style to new products, the initial product becomes a reference in itself that can be employed by designers and recognized by consumers. Nokia, for instance, makes use of so-called "lead products" to clarify internally what is representative for a set of products that are to be styled in a similar fashion.[63] Internally, these products express what Nokia desires to communicate to a specific target group in the market, and by studying these products Nokia's designers learn how they can embody the same brand style in new products aimed at the same target group.

A nurture phase ends when the process underlying the creation of a brand style enters a new search phase, or when it enters a *vary phase*. In a vary phase, a designer remains "true" to the original solutions but tries to build on them by incorporating new brand style references. To stay with the example of Nokia, at the turn of the century the company nurtured a particular solution in its mobile phones in response to the need (or challenge) to appear user friendly: many models were designed with a U-shaped curve under the display, denoting a friendly smile. Later Nokia phones (such as

38 See, for example, Stephen N. Smyth and David R. Wallace, "Towards the Synthesis of Aesthetic Product Form" (paper presented at the ASME 2000 Design Engineering Technical Conference and Computers and Information in Engineering Conference, Baltimore, Maryland, 10–13 September 2000), McCormack, Cagan, and Vogel, "Speaking the Buick Language: Capturing, Understanding, and Exploring Brand Identity with-Shape Grammars," 2–3.

39 Strictly speaking, evolution theory does not imply progress, since it does not assume that the principle of adaptation through survival has a particular direction. However, the applications of evolution theory in art have historically looked at evolution teleologically as a series of progressions, in correspondence to the popular reception of evolution theory in the late nineteenth and early twentieth century.

40 Ackerman, "A Theory of Style", 230–32; Gombrich, "Style," 354; Schapiro, "Style," 142–44.

41 Karjalainen, "Semantic Transformation in Design: Communicating Strategic Brand Identity through Product Design References," 102–45.

42 Ernst H. Gombrich, *The Sense of Order—a Study in the Psychology of Decorative Art* (Oxford: Phaidon Press, 1979), 210.

43 McCormack, Cagan, and Vogel, "Speaking the Buick Language: Capturing, Understanding, and Exploring Brand Identity with-Shape Grammars," 6.

44 T. Moulson and G. Sproles, "Styling Strategies," *Business Horizons* 43: 5 (2000): 47–48.

45 Karjalainen, "Semantic Transformation in Design: Communicating Strategic Brand Identity through Product Design References," 148–52.

46 For more information about this early manifestation of consumerism, see Penny Sparke, *Design in Context* (London: Bloomsbury, 1987), 21–23.

47 http://www.moma.org/interactives/exhibitions/1999/differentroads/cars/fiat_multiple.htm (accessed 10/2009).

the 7600 model) showed variations of this style, no longer featuring a U shape but a curved, more leaf-like silhouette. Within Nokia this was not considered a big digression from the U shape because it was felt that the phones retained the value of user-friendliness through their reference to an organic and natural shape.[64]

This multi-phase perspective of brand styles implies that there can be a different perspective on market differentiation at different stages of the production of a brand style. The first association an individual reflecting on a brand style will have is that it serves to position the products of brand A against the products of brand B. However, the multi-phase view of brand styles makes it plausible that brand styles can also serve other types of market positioning for a brand. For example, differentiation against previous models of the same brand is a likely focus during the search phase, and differentiation against other models in the current brand portfolio is a likely focus of brand styles during the vary phase.[65] Thus, the multi-phase view of style production can help clarify the diverse role of design in differentiating a brand in the market.

In art historical writing, two forces are frequently mentioned as influencing changes in style, over and above their creators' intrinsic need for change: technological improvements and social rivalry (fashion).[66] Technological improvements are relevant because they determine the boundary conditions for a solution. When applied to product design, technological improvements are particularly relevant because they determine what is economically feasible to produce.[67] For example, the traditional technique for painting a car body at the beginning of the twentieth century was to coat the body with multiple layers of lacquer paint. The required drying period for each layer resulted in production times of up to a month. When Ford set out to produce the low cost Model T, this time was reduced to about four hours by flowing enamel on sheets of metal and drying it in large ovens. However, due to the high temperatures in the ovens, this production technique initially only worked for black pigments, and black became a prominent attribute of Ford's Model T style. When General Motors set out to challenge Ford's market dominance in the 1920s, the development of the nitrocellulose lacquer paint Duco allowed them to produce cars in more varied and colorful styles while still maintaining a quick drying time.[68, 69]

Technological improvements do not necessarily render older technologies obsolete. Gombrich stated that the use of older technologies can serve the purpose of re-enactment and preservation, and as a result provide objects with symbolic meanings.[70] Some brands seem to consciously seek to benefit from this. Harley-Davidson prominently displays its classic V-twin engine, a technical solution from the 1920s. This is one of the features that has turned its motorcycles into American icons.[71] The company uses these engines even though more technically sophisticated solutions are available. Technology can also indirectly influence the creation of styles when

48 The low appeal among consumers for the Multipla style was reaffirmed in 2007 when *Time* magazine placed the car on its list of "The 50 Worst Cars of All Time." http://www.time.com/cars/ (accessed 10/2009).

49 Ackerman, "A Theory of Style," 228.

50 Ibid., 236.

51 For a review about the position and significance of Ackerman's treatment of style in art history, see Minor, *Art History's History*, 129–34.

52 Schapiro, "Style," 146.

53 Richard Wollheim, "Looking for the Styleme," in *The Concept of Style*, ed. Berel Lang (Ithaca, NY: Cornell University Press, 1987), 200.

54 Davis, "Style and History in Art History," 19–21.

55 David Pye, *The Nature of Design* (London: Studio Vista Ltd., 1964), 26.

56 For some examples from the automotive industry see C. Bangle, "The Ultimate Creativity Machine—How BMW Turns Art into Profit," *Harvard Business Review* 79:1 (2001): 47–55, 174, Henry W. Wolpert, "Why Conventional Automobile Styling Research May Become Obsolete," *Advances in Consumer Research* 7: 1 (1980).

57 Davide Ravasi and Gabriella Lojacono, "Managing Design and Designers for Strategic Renewal," *Long Range Planning* 38:1 (2005): 51–77.

58 Leonard B. Meyer, "Towards a Theory of Style," in *The Concept of Style*, ed. Berel Lang (New York: Cornell University Press, 1987), 30–31.

59 Ravasi and Lojacono, "Managing Design and Designers for Strategic Renewal," 73.

60 This was already much in evidence during the German Renaissance, when competition drove independent wood sculptor shops to produce "showily skillful" styles and brand them with the initials of the master sculptor. Michael Baxandall, *The Limewood Sculptors of Renaissance Germany* (New Haven and London: Yale University Press, 1980), 121.

61 For a longer discussion on how designers are bound by existing solutions, see Jan Michl, "On Seeing Design as Redesign: An Exploration of a Neglected Problem in Design Education," *Scandinavian Journal of Design History* 12 (2002): 7–23.

it is invoked (for what it signifies and its artistic qualities) in the design of other objects.[72] Streamlining initially emerged in aviation technology to improve flight efficiency. Later, everyday products also were streamlined to convey an expression of progress, speed, and non-friction.[73]

The second factor frequently mentioned as an influence on changes in style is competitive social rivalry among both producers and consumers. Social rivalry is important because it influences the direction in which a style develops. Gombrich noted that once something becomes a source of social rivalry, competition results in expressions far beyond functional and technological purposes.[74] In Gombrich's view, even the decision to not conform to the rules of competition constitutes adherence to its underlying principles. If a challenger to the current rules can acquire sufficient social prestige, she/he might create a nonconformist fashion that ultimately leads to new rules of competition. Thus, the solution offered by a challenger is relevant because it may point to the direction in which a field of experimentation is likely to become productive.[75]

The Reception of Brand Styles

Art historians position themselves as the receivers of a style when classifying art and architectural objects as belonging to a style while hypothesizing about their maker, significance, use, etc.[76] In their attempt to attribute objects to an origin, art historians long lacked detailed knowledge about the production process behind their objects of study. As a consequence, art historians often had to rely on similarities and differences between the structural qualities of objects (the so-called "like and unlike") in order to be able to determine the origin of objects on the basis of an attribution of style.[77, 78]

Like art historians, consumers, designers, and the companies they work for may also focus on the style of products and the brands they belong to, on the basis of what is like and unlike.[79] Thus, brand styles can help to identify a product's origin and make sense of its place in the world.[80] In this sense-making, the attribution of products to a brand style is based on perceived similarities and differences between products within the brand and between different brands. Based on our discussion of style production in the previous section, we expect that these similarities and differences are based on reoccurring sets of solutions to problems or challenges, leading to recognizable effects (or a conspicuous lack thereof) in the structural qualities of a selection of products of a brand on certain markets, during a certain period of time.[81]

In addition, receivers in the market may be unaware of the company's practices and intentions, and they may have other interests when ascribing products to a brand style. In art history, it has been noted that each attribution of an object to a style starts with a focus in interest (e.g., aesthetic, technical, or expressive) on the part of the individual(s) making the attribution.[82] As a result, the grounds

62 Rowenta launched the Surfline iron prior to the iMac. Regarding its apparent similarities with the iMac, Rowenta's marketing manager (Steve Jones) gave the following statement: "Rowenta is flattered to see that the new iMac design bears a close resemblance to our Surfline iron, which was launched five years ago. We wish Apple all the success with iMac that we have had with our irons." http://www.theapplecollection.com/iMac/iStore/iron.html (accessed 10/2009).

63 Karjalainen, "Semantic Transformation in Design: Communicating Strategic Brand Identity through Product Design References," 148–77.

64 Toni-Matti Karjalainen and Dirk Snelders, "Designing visual recognition for the brand," *Journal of Product Innovation Management* (In press).

65 Extending the work of the Swedish designer and design theorist Rune Monö, Warell argues that a "product's identity [style] can be described on three axes; the product range of the manufacturer; the products available on the market as a whole; and the historic succession of generations of products." He then proposes that descriptions on these axes can be used to position a product on the market. Warell, "Design Syntactics: A Functional Approach to Visual Product Form," 51. In support for such a claim, Karjalainen and Snelders found that Nokia supports its portfolio strategy through style differentiation and that Nokia actively seeks differentiation with respect to competitors as well as between different product lines within their portfolio. Toni-Matti Karjalainen and Dirk Snelders, "Designing Visual Recognition for the Brand," *Journal of Product Innovation Management* (In press).

66 Gombrich, "Style," 354–56. See also, Ackerman, "A Theory of Style," 229; Schapiro, "Style," 160–63.

67 Pye, *The Nature of Design*, 46.

68 David Gartman, "Tough Guys and Pretty Boys: The Cultural Antagonisms of Engineering and Aesthetics in Automotive History," *Morf* 5 (2006): 73–78.

on which a receptive audience identifies a brand style are only loosely connected to the practices and intentions of its producers. This idea is taken to its logical conclusion by Elsner, for whom style is "a rhetorical tool whereby the visual practices of periods of the past or the different works of particular individuals (unconsciously similar through their shared stylistic quirks) may be defined."[83]

Elsner's idea of style as a rhetorical tool suggests that what we notice in the design of a branded product also depends on what we seek. Even with full knowledge of the designer's and company's intentions, consumers and design experts still may have their own problems to solve when attributing objects to styles. In addition, style attribution is subject to "distorting" psychological effects. With respect to this, Gombrich noted that "it is the deviation from the convention that is intended to impress you, but as soon as the deviation turns into a convention of its own . . . [it] leads inexorably to its demise."[84] As a result, in distinguishing the unlike from the like we may initially overestimate, and later underestimate, what may be recognized as the most prominent characteristics of a style.[85]

The looser connection between defining styles in the process of production and attributing objects to styles in the process of reception holds two important consequences. First, a style is not statically grounded in objects; instead during reception, it is "sought" and expressed by someone.[86] As such, a classification of a product to a style is revealing, as it unveils our perception of, and justifications for, similarities and differences among products and brands.[87] We noted above that style attributions have been criticized for this. However, here we want to argue that it is precisely because such judgments can be criticized that they have value in the design process. The attempts of experts, consumers, designers, and companies to attribute products to a style reveal how these different parties look at products and how they compare them to other products. Thus, by encouraging people to identify products according to their brand style, product design as an activity can become more self-aware, and therefore more open to discussion and guidance from others in the design field (such as consumers and managers of the company's brand portfolio). For this reason, we would urge companies and designers to become aware of how the products falling under a brand can be said to have a certain style and how their style attribution compares to others.

Second, since the recognition of brand styles in the market depends on a product's perceived similarity with and difference from other objects, knowledge influences how we attribute products to a style. A person must recognize and know some of the attributes that are seen as typical for a style to be able to classify objects as representative of it. This knowledge can be acquired through a long involvement with certain brands, and a desire to see a certain style in the products of a brand (or a subset of them).[88] On the whole, this knowledge may influence our ability to spot similarities or

69 For more information on the impact of technology on the expression of color and style in art see Philip Ball, *Bright Earth: The Invention of Colour* (London: Vintage Books, 2001).

70 Gombrich, "Style," 254–55.

71 Peter Stanfield, "Heritage Design: The Harley-Davidson Motor Company," *Journal of Design History* 5: 2 (1992): 142–49.

72 Schapiro, "Style," 160–61.

73 Jeffrey L. Meikle, *Design in the USA*, Oxford History of Art (New York: Oxford University Press, 2005), 116–25.

74 Gombrich, "Style," 355.

75 Pye, *The Nature and Aesthetics of Design*, 131.

76 Ackerman, "A Theory of Style," 227.

77 Elsner, "Style," 102.

78 While there is no universal system for describing the similarities and differences within and between such groups, Schapiro noted that classifications of style were often based on "form elements or motives, form relationships, and expressions." Schapiro, "Style," 139.

79 J. P. L. Schoormans and H. S. J. Robben, "The Effect of New Package Design on Product Attention, Categorization and Evaluation," *Journal of Economic Psychology* 18:2–3 (1997): 271–287.

80 This is similar to style attribution in art, c.f., Ernst H. Gombrich, *Gombrich on the Renaissance*, 4th ed., vol. 1 (New York: Phaidon Press Inc., 1985), 9.

81 With respect to the treatment of style in art history, Davis notes that a way of working produces a style "insofar as certain actions have certain exhibited or unexhibited effects." Davis, "Style and History in Art History," 29.

82 Paul Mattick, "Context," in *Critical Terms for Art History*, ed. Robert S. Nelson and Richard Shiff (London: University of Chicago Press, 2003), 114.

83 Elsner, "Style," 106.

84 E. H. Gombrich, *The Uses of Images—Studies in the Social Function of Art and Visual Communication* (London: Phaidon Press Limited, 1999), 256.

differences over products and brands. For example, the Jaguar X-type and the Ford Mondeo cars might not appear to have many similarities in their styles. However, both brands are owned by Ford Motor Company, and the cars are based on the same platform and share many components. Closer inspection of the cars—and knowledge of the car business or conversations with car mechanics—may lead consumers to the (somewhat self-ingratiating) conclusion that there are more similarities to these models than one would at first expect.[89]

In mass markets where consumers lack sufficient knowledge about product design, imitations of brand styles are often interpreted as undesirable for the "original" producer because they may lead consumers to believe that a copycat brand has the same qualities as the "real" brand.[90] It is therefore not surprising that many companies go to great lengths to protect their brand styles. The success of the non-conforming Apple iMac style, for instance, inspired a number of other brands to launch products with colored casings too. The products of Emachines (the eOne) and Future Power (the AIO) duplicated the iMac style to such a degree that Apple filed lawsuits against them.[91] Still, in the same way that style definitions may differ among art historians, what consumers see as representative of a style is not fixed, and protecting a brand style is a challenging task.[92] Perhaps it is also an overly constraining one. Not all misconceptions about a style are necessarily bad; many can lead to new and potentially valuable meanings being attached to the brand, which may be commercially interesting for companies in their own right.[93]

Final Comments

In the spirit of Wölfflin, who compared shoes to cathedrals, we have approached the notion of brand styles by departing from earlier texts on style written by historians and philosophers of art and architecture. We proposed that the expression of a brand style is grounded in the use of a particular set of solutions to an unexplored problem or challenge facing a producer of branded goods. The solution set can vary as it passes through different phases, each of which can be characterized by a particular perspective on the market differentiation of the brand. However, we also recognized that designers would be ill-advised to rely too heavily on replicating existing attributes in new products to achieve brand recognition, without first critically reflecting on comparable products and their similarities and differences. By distinguishing the like from unlike, designers should consider how they can contribute to the style attributions made by the receivers of a style, while searching, nurturing, and varying in the way that they work.

Finally, the differentiation of brand styles from other brand styles is an enduring phenomenon to be studied and mastered by designers in their own right, especially by those working in

85 With respect to such comparisons, an interesting finding from psychology is that two objects may be recognized as similar to each other simply because they are perceived as unlike a third. For more information about how we form categories on the basis of judgments of similarity, see R. L. Goldstone, "The Role of Similarity in Categorization: Providing a Groundwork," *Cognition* 52:2 (194): 125–157.There also is a whole body of work in psychology that supports Gombrich's claim. New, discrepant information (in our case, a new style) may initially incite effortful processing of the information, which, in turn, leads people to compare and contrast this information with accessible knowledge from memory. However, these same studies show that, once this information becomes less surprising and more congruent to our expectations, people tend to show the opposite effect of assimilating information too easily and automatically, and by doing so exaggerating the similarity between incoming information and knowledge from memory. Paul M. Herr, "Consequences of Priming: Judgment and Behavior," *Journal of Personality and Social Psychology* 51:6 (1986): 1106–1115, G. Mandler, "The Structure of Value: Accounting for Taste," in Affect and Cognition: *The Seventeenth Annual Carnegie Symposium on Cognition*, ed. M. S. Clark and T. Fiske (Hillsdale, NJ: Erlbaum, 1982). For a broader discussion on psychology and style, see M. Stacey, "Psychological Challenges for the Analysis of Style," *Ai Edam-Artificial Intelligence for Engineering Design Analysis and Manufacturing* 20:3 (2006): 167–184.

86 Davis, "Style and History in Art History," 19.

87 The expressive character of style definition with respect to its user's expertise, knowledge and opinions has been suggested as a prominent reason why the notion of style for periods has been so discredited in art historical writing. Sohm, for instance, notes that a style definition "tells us what codes a person has selected to signal political and social allegiance" and as such leaves the individual open to criticism about his or her expertise. Sohm, *Style in the Art Theory of Early Modern Italy*, 14.

a commercial setting. However, given that styles are inherently ambiguous, we need to approach style adaptively, with an eye to the problem at hand. Brand style attributions enable us to define the potential of a design in light of other designs that either complement or compete with what a brand produces.

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88 For art, Goodman stated: "Styles are normally accessible only to the knowing eye or ear, the tuned sensibility, the informed and inquisitive mind." Goodman, "The Status of Style," 810. Also see Elsner, "Style," 102; Minor, *Art History's History*, 133–36; Nelson Goodman, "Art and Authenticity," in *Aesthetics Today (Revised Edition)*, ed. Morris Philipson and Paul J. Gudel (New York: New American Library, 1980), 189–94.

89 In fact, Jaguar initially received extensive criticism in the press for making the X-type so similar to the Mondeo, because it was seen to dilute the Jaguar brand. See, for example, Kathleen Kerwin, "Ford Learns the Lesson of Luxury," *Business Week*, March 1, 2004: 116–117.

90 G. Miaoulis and N. Damato, "Consumer Confusion and Trademark Infringement," *Journal of Marketing* 42:2 (1978): 48–55.

91 Pui-Yik Chong, "An Exploratory Study of the Dilemma of Product Styling: A Style Life Cycle or Still a Designer's Gut?" (paper presented at the IAMOT [International Association for Management of Technology], Washington DC, 3–7 April 2004).

92 On a legal level there is a distinction between a situation when (1) a company designs its products to resemble those of another company and (2) a company that strictly copies the style of a competitor. However, due to the practical problems involved in making a clear distinction between these two situations, companies often go to great lengths in trying to justify the uniqueness of their styles. For more information on the legal challenges in protecting brand styles, see J. N. Kapferer, "Brand Confusion—Empirical-Study of a Legal Concept," *Psychology & Marketing* 12:6 (1995): 551–568.

93 An interesting case is Harley Davidson, whose current style to a large extent refers back to the way in which, amateur motorists in the 1960s customized cheap second-hand motorcycles of Harley Davidson and started treating them as icons for a modern outlaw lifestyle, against the original intentions of Harley Davidson. Holt, *How Brands Become Icons: The Principles of Cultural Branding*, 155–88. The value of such misconceptions (or creative misreadings) by design experts and consumers in attaching meaning to products has been discussed by, for example, Adam Richardson, "The Death of the Designer," *Design Issues* 9:2 (1993): 34–43, Peter Lloyd and Dirk Snelders, "What Was Philippe Starck Thinking Of?," *Design Studies* 24:3 (2003): 237–253.

Beyond Duty and Virtue in Design Ethics

Philippe d'Anjou

Introduction

An important issue concerning design ethics is the nature of the moral character of the designer.[1] Ethics in the disciplines of design has essentially been articulated around notions of duty and virtue,[2] which correspond broadly to Kantian and Aristotelian views respectively.[3] These in turn belong to two general conceptions of ethics, namely imperative and attractive moralities.[4] The imperative view refers to the principles of duty and universal law achieved through reason and to which one must obey in all circumstances. This is, for instance, what Kant calls the categorical imperative. Most professional codes of ethics and practice in design disciplines belong to that tradition. Virtue ethics is the practice of one's virtues that leads to the perfection of moral character, which implies that the character of the individual is somehow a fixed attribute or an objective feature.[5] It is in opposition to these conventional conceptions of the imperative principle of duty and universal law, on the one hand, and of virtue ethics which treats a person's character as a collection of objective facts, on the other hand, that Sartre's view of human freedom and ethics has to be seized as a possible foundation for design ethics. Indeed, Sartre provides a radically different perspective on the nature of human character. A conception of design ethics based on a Sartrean existentialist conception of human reality may offer a particularly enlightening and useful perspective on the nature of the moral character of the designer and therefore a ground for design ethics.

In a Sartrean perspective, cause and motive[6] (reason and emotion) cannot provide a definitive basis for the action of the individual in the pursuit and justification of moral duty or moral virtue. Cause and motive are to be placed in relation to a much more basic reality, namely the freedom of the individual. Indeed, the designer confronting a moral choice is free to choose, and by making a free choice he/she is creating his/her existence.[7] According to Sartre, the "authenticity" with which the individual faces his/her freedom is the primary criterion for judging actions as ethically good or bad. Thus, if the designer's moral character (i.e., authenticity) has meaning in a Sartrean perspective, it is to be found not in instrumental reason but in being reflectively conscious of his/her human condition and acknowledging and accepting his/her freedom. For

1 An insightful account of design in relation to ethics can be found in the work of Tony Fry, where ethics is ontologically embodied in the agency of design, which is represented by both the designer and the designed. The focus in this article is on the person aspect of the agency of design ethics. See the essays by Tony Fry in *Design Philosophy Papers*. See also T. Fry, *A New Design Philosophy: An Introduction to Defuturing* (Sydney: UNSW Press, 1999).

2 A quick survey of the literature that addresses design ethics, which has been growing since the last fifteen years, shows that the discourse articulates mainly according to these two ethical traditions. Without being exhaustive, I refer the reader to some prominent examples such as: W. Fox, (ed.), *Ethics and the Built Environment* (New York: Routledge, 2000). W. Fox, *A Theory of General Ethics* (Cambridge: MIT Press, 2006). L. Pelletier, and A. Perez-Gomez (eds.), *Architecture, Ethics, and Technology* (Montreal: McGill-Queens University Press, 1994). B. Wasserman, et al., *Ethics and the Practice of Architecture* (New York: Wiley & Sons, 2000). A. Snodgrass, and R. Coyne, *Interpretation in Architecture* (New York: Routledge, 2006). T. Spector, *The Ethical Architect* (New York: Princeton Architectural Press, 2001) and N. Ray, (ed.), *Architecture and its Ethical Dilemmas* (New York: Taylor & Francis, 2005).

the designer engaged in bringing a world into existence through the act of design, the main obstacle to achieving an authentic character is the attitude of "bad faith."[8]

Once we accept the idea that a person's morality does not consist of acting according to universal laws or is not made of fixed and objective virtues, then the following questions arise: on what basis do we judge the choices and actions of a designer who constantly faces ethical choices in ambiguous and complex situations? What sense can be made of the notion of "authentic" character for individuals in the practice of design? How is bad faith manifested in design decisions and actions? How might a Sartrean approach in design education and practice direct us toward authenticity in design and therefore in design ethics?

Sartre's writings are neglected in design ethics literature,[9] yet his perspective on human freedom and character has relevance.[10] This paper will introduce and explore the implications of such a perspective for design ethics, with specific attention to how such an approach might suggest changes in the way ethics is considered in design education as well as the way the designer deals with ethical issues.

Freedom: The Foundation of Action

In *Being and Nothingness*[11] Sartre addresses the role of "cause" and "motive" in the conduct of humans by clarifying the concept of action. He defines cause as the rational considerations that justify the action and motive as emotional subjectivity that drives one to act.[12] In order to understand the place of cause and motive in the conduct of the designer, it is essential to see how they relate to design as action. Sartre defines action in the following way:

> . . . to act is to modify the shape of the world; it is to arrange means in view of an end; it is to produce an organized instrumental complex such that by a series of concatenations and connections the modification effected on one of the links causes modifications throughout the whole series and finally produces an anticipated result.[13]

To act is indeed to bring something into existence; but what is important is that action is intentional.[14] Sartre asserts that no action can be causally explained. Further, intention is to be understood as seeing a lack and action implies as its condition the recognition of a *desideratum* (objective lack).[15] For instance, a group is in need of a place for worshiping; a building for worshiping is therefore lacking in the present. The act of the designer is described as "creation of a building for worshiping." This action necessitates the conception of a new building that is lacking but is possible and desirable. What Sartre calls objective lack is what the act of creating the building is meant to fulfill. The designer acts in view of a desirable reality not yet realized. Intentions are not constituted of the simple consid-

3 Kant's ethical theory is mostly developed in his work *Groundwork of the Metaphysic of Moral*. Morality for Kant is based on the obedience of universal principles established by reason. Kant is somehow the source of the deontological tradition in the professional disciplines. All code of deontology derives from such a tradition. The ethical study of Aristotle is mostly presented in his *Nichomachean Ethics*. For Aristotle, morality is based on the exercise of a series of virtues that the individual practices in life in order to achieve the good life.

4 M. Canto-sperber, *La Philosophie Morale* (Paris: PUF, 2004), 52–53.

5 Findeli and Bousbaci propose an epistemological paradigm for architecture based on Aristotle and virtue ethics and the concepts of *poiesis* and *praxis*. See "More Acting, Less Making, a Place for Ethics in Architecture's Epistemology" in *Design Philosophy Papers* 4 (2005). Snodgrass and Coyne propose similar insights for design education in *Interpretation in Architecture* (New York: Routledge, 2006), 111–15.

6 Sartre uses the French terms *motif* and *mobile*. In the English translation of *Being and Nothingness* by H. E. Barnes (1992), these terms are translated with *cause* and *motive* respectively. Cause in this case is understood as *reason* for action and refers to an external fact or situation without carrying the idea of determinism. Motive refers to an inner subjective fact or attitude, 562, 800, 804.

7 The Sartrean perspective presented in this paper is from his early work *Being and Nothingness*, trans. Hazel E. Barnes (New York: Philosophical Library, 1956), 1992.

8 Sartre explains the notion of "bad faith" in *Being and Nothingness*, chapter 2. Bad faith is the attempt by the individual to escape from responsibility and freedom by using self-deception.

9 In addition to the present article, I have written two other articles that address the issue of design ethics from a Sartrean perspective. See P. d'Anjou, "The Existential Self as Locus of Sustainability in Design" in *Design Philosophy Papers*, 3–4 (2007); and P. d'Anjou, "Toward an Horizon in Design Ethics" in *Science and Engineering Ethics*, (2009). DOI: 10.1007/s11948-009-9157-y.

eration of the real state of things.[16] The statement that a group needs a place to worship does not imply in itself any judgment. But to claim that there should be a place for such worshiping is to consider the situation as lacking. Seeing the attributes of a context as lacks compared to a desirable possibility provides the basis for the designer's intention to transform the given context—creating a building. To act presupposes the conception of what *is not*, what *can become*, and what *should be* the reality in the mind of the designer. Hence two conclusions:

No factual state of affairs whatever it may be (the political and economic structure of society, a person's psychological "state," the forces of globalization and economic competition) is capable by itself of motivating any act whatsoever. For an act is a projection of the individual's consciousness toward what is not.

No factual state of affairs can determine consciousness to apprehend it as a negation or a lack.[17] To the first conclusion, Sartre adds that an action is a projection of the person's consciousness[18] toward what is not. This means that in acting, the designer aims at a non-existing reality in the present, and nothing that exists in the present can point to something that does not exist in the present. Sartre holds that the individual only—consciousness—effects the reference to what is non-existing. "Man is the being through whom nothingness comes to the world."[19] The second conclusion emphasizes that no existing reality presents itself to a conscious individual with intrinsic meaning. Only humans are capable of imposing such meaning onto factual reality. Then "the indispensable and fundamental condition of all action is the freedom of the acting being,"[20] a freedom that consists in the designer's projection of a particular end. Actions being intentional involve that situations be comprehended as lacking. From here Sartre goes on to consider two aspects.

First, consciousness has the capability to break with and distance itself from its past and its surrounding conditions, and to confer a new meaning on them.[21]

Second, the individual's freedom is a basic condition of action, and causes and motives of actions can be grasped only in relation to this freedom.[22] By positing the possibility of an ideal reality that does not exist, the designer gives him/herself causes to act. Likewise, motives can be understood only in relation to an end. The non-existent reality which the designer posits gives to a present motive its meaning, and if it is impossible to find actions without motives or prior causes, it is because motives and causes are integral parts of actions. However, the act is not explained by these causes and motives, rather, it is that "which decides its ends and its motives, and the act is the expression of freedom."[23]

Sartre acknowledges the general meanings of causes to a point. Causes, or objective states of affairs, are used to explain actions. For instance, a design student's adoption of the principle

10 The analysis here is limited to Sartre's early philosophy, mainly exposed in his seminal work *Being and Nothingness*, and to what scholars call his first ethics, i.e., ethics of authenticity. For more on Sartre's ethics see T. C. Anderson, *Sartre's Two Ethics* (Chicago: Open Court, 1993).

11 J-P. Sartre, *Being and Nothingness*

12 Ibid., 800, 804.

13 Ibid., 559.

14 Ibid. Also, on the issue of design defined in terms of intentional action, see P. Galle, "Design as Intentional Action, a Conceptual Analysis" in *Design Studies*, 20:1 (1999), 57–81.

15 Ibid., 560. Sartre calls that objective lack a "négatité" (negation).

16 Ibid., 561.

17 Ibid., 562.

18 Sartre calls the consciousness of the person, the conscious being, *being for-itself* as opposed to the nonconscious beings that he calls *being in-itself*. These notions are at the core of his ontology as encountered in *Being and Nothingness*.

19 *Being and Nothingness*, 59.

20 Ibid., 563.

21 For Sartre the apprehension of conditions and their meaning "implies for consciousness the permanent possibility of effecting a rupture with its own past, of wrenching itself away from its past so as to be able to consider it in the light of a non-being and so as to be able to confer on it the meaning which it has in terms of the project of a meaning which it does not have." Ibid., 563.

22 Causes and motives, "have meaning only inside a projected ensemble which is precisely an ensemble of non-existents. And this ensemble is ultimately myself as transcendence; it is Me insofar as I have to be myself outside of myself." Ibid., 564.

23 Ibid., 565.

of sustainability can be explained with reference to a dominating academic or market ideology, which represents an objective fact. In this sense, "the cause is characterized as an objective appreciation of the situation."[24] However, an objective appreciation can be made only in light of a presupposed end and within the limits of the individual's project toward this end.[25] Consequently, the meaning of cause is qualified in this way:

> We shall therefore use the term cause for the objective apprehension of a determined situation as this situation is revealed in the light of a certain end as being able to serve as the means for attaining this end.[26]

Compared to traditional meanings, it is not the objectivity of realities that Sartre alters. The key element is that constituting some reality as cause for acting depends on the ends the individual proposes for him/herself. For instance, the instrumental implications of an object depend on what we intend; a knife can be used as a screwdriver. The cause as an objective evaluation of situations does not determine an action; it "appears only in and through the project of an action."[27] The individual must have projected him/herself "in this or that way in order to discover the instrumental implications of instrumental-things."[28] In brief, "the world gives counsel only if one questions it, and one can question it only for a well-determined end."[29]

While cause refers to an objective calculation of a reality in light of a given end, motive refers to the subjective structures which are correlative with the cause.[30]

In projecting toward some end, the individual constitutes causes of an objective reality. In the example above, the design student sees the power of sustainability as a cause for adopting its principles. The motive is being conscious of moving toward an end in light of which the cause was constituted. "The motive is nothing other than the apprehension of the cause insofar as this apprehension is self consciousness."[31] The student's ambition is the subjective correlate of his/her constituting the power of sustainability as a cause for action. But such motives are not forces that pre-exist, they are embodied in the projects of which they are partial structures.

> The cause, the motive, and the end are the three indissoluble terms of the thrust of a free and living consciousness, which projects itself toward its possibilities and makes itself defined by these possibilities.[32]

Sartre concludes that the idea of rational choice arrived at by an objective deliberation about objective factors is an illusion. "How can I evaluate causes and motives on which I myself confer their value before all deliberation and by the very choice which I make of myself?"[33] Indeed, "When I deliberate the chips are down."[34]

In summary, causes and motives are understood only within the structure of action, which is intentional. While causes are

24 Ibid., 575.
25 Ibid.
26 Ibid., 575–76.
27 Ibid., 578.
28 Ibid., 577.
29 Ibid., 578.
30 Sartre puts it this way: "The consciousness which carves out the cause in the ensemble of the world has already its own structure; it has given its own ends to itself, it has projected itself toward its possibles, and it has its own manner of hanging on to its possibilities: this peculiar manner of holding to its possibles is here affectivity." Ibid.
31 Ibid., 579.
32 Ibid.
33 Ibid., 581.
34 Ibid.

objective evaluations of realities, the constitution of causes from them depends on the interest or personal projection of the self. Motives are the subjective counterparts of causes constituted by the individual's projections in certain ways. But these projections do not refer to "will" which is equivalent to choosing some action. This could not happen without a prior projection of the self-guiding deliberate choice. In turn, choices make the projected individual become real. A number of questions arise about the nature of rational character in Sartre's philosophy if causes and motives are constituted in the individual's projection toward his/her possibilities. What are these more basic projects? How can one know them? Is it possible to find any causal meaning in them?

The particular causes, motives, and ends of actions, and actions themselves, are all part of a more inclusive structure. The fact that the individual could have acted otherwise leads to articulate the problem like this: "I could have done otherwise. Agreed. But at what price?"[35]

The projects that give meaning to causes and motives are basic choices of oneself in one's way of responding to the world. The individual witnesses the choices he/she has made within the meanings that he/she ascribes to the world.

The value of things, their instrumental role, their proximity and real distance . . . do nothing more than to outline my image—that is, my choice . . . —that is, my being.[36]

Thus, when the designer opts for a particular action, he/she chooses a particular project that is part of a fundamental project. The specific choice and action are not arbitrary; they are part of a certain way to envision the world. Doing otherwise involves a fundamental modification of the designer's choice of self. But "this modification is always possible."[37]

The person's consciousness of his/her freedom to choose his/herself can bring out feelings of anguish and responsibility. The person becomes aware that his/her choices are not justifiable but are simply free assertions of his/her self.

> . . . we are perpetually engaged in our choice and perpetually conscious of the fact that we ourselves can abruptly invert this choice and "reverse steam". . . . By the sole fact that our choice is absolute, it is fragile.[38]

Thus, the project, from which causes and motives emerge, is a choice of the self at a fundamental level. And this choice is absolute.

The contention that freedom is absolute raises the question of the status of various conditions in human experience. Who can say that the individual is free in relation to objective conditions? In order to clarify the question of limits to human freedom, and to show again Sartre's view of how causes and motives emerge, it is necessary to review Sartre's discussion of some of these conditions.

35 Ibid., 585.
36 Ibid., 597.
37 Ibid., 598.
38 Ibid.

> The given . . . could never be a cause for an action if it were not appreciated. In addition, the appreciation, if it is not to be gratuitous, must be effected in the light of something. And this something which serves to appreciate the given can be only the end. Thus the intention by a single unitary upsurge posits the end, chooses itself, and appreciates the given in terms of the end.[39]

This does not mean that conditions are chosen to exist. Instead, "by the choice which it makes of its end, freedom causes the datum be revealed in this or that way, in this or that light in connection with the revelation of the world itself."[40] Situations are constituted by the way that the individual relates to conditions. The level of difficulty in situations reveals as much about a person as it does about condition. To an architect, a building is easy or difficult to renovate, whereas to a pedestrian it is beautiful or ugly. Moreover, whether the building will be easy or difficult to renovate is not an objective property. What is difficult for one can be easy for someone else.

In a similar way, the past as a determinant of action depends on the person's freely constituted project in the present. No individual can change the past. Still, the meaning of the past depends on the person's commitments in the present.[41]

Character: The Project of Oneself

Character is often depicted as a given nature about a person. For Sartre a persistence of character only means that the person persists in a certain projection of him/herself. He argues that,

> . . . character is a vow. When a man says, "I am not easy to please," he is entering into a free engagement with his ill-temper, and by the same token his words are a free interpretation of certain ambiguous details in his past. In this sense there is no character; there is only a project of oneself.[42]

The aim of Sartre's description of various conditions is to clarify the human situation. His conclusions give rise to the question of whether causes or motives ought to be the priority of design ethics. While the individual lives among conditions, it is he/she who imbues meaning to those conditions through his/her way of being. The situation comes into being only as he/she transcends—projects—the given toward some end. Yet the situation is neither solely subjective nor objective. It is neither the impression of reality nor reality itself.

> The situation . . . is a relation of being between a for-itself and the in-itself which the for-itself nihilates. The situation is the whole subject (he is nothing but his situation) and it is also the whole "thing" (there is never anything more than things). The situation is the subject illuminating things by his very surpassing, if you like; it is things referring to the subject his own image.[43]

39 Ibid., 615.

40 Ibid., 626.

41 ". . . by projecting myself towards my ends, I preserve my ends, I preserve the past with me, and by action I decide its meaning. Who shall decide whether the period which I spent in prison after a theft was fruitful or deplorable? I—according to whether I give up stealing or become hardened. Who can decide the educational value of a trip, the sincerity of a profession of love, the purity of a past intention, etc.? It is I, always I, according to the ends by which I illuminate these past events." Ibid., 640.

42 Ibid., 705.

Because situations exist in terms of the individual's projection of him/herself, Sartre asserts that a situation or a point of view cannot have any special importance. To say that a situation has particular significance is to say that the objective facts should receive some countenance. Yet "the world gives counsel only if one questions it, and one can question it only for a well-determined end."[44] With respect to a projected end, circumstances will be more or less suitable and have value from some viewpoint; the point of view assumed is the individual's own, and each situation, by virtue of the individual being in a certain relation to factual realities, is concrete.

Freedom and Morality

Should cause or motive be the priority of design ethics, and which is more likely to contribute to human well-being and happiness? On the one hand, motives stress the potency of emotions and attitudes in guiding what we do and what we believe. On the other, causes stress the importance of having good reasons for actions. Sartre transforms the way of responding to the question with the argument that both causes and motives come from something more fundamental in human action, which is the individual's free projection of his/her way of being. If the priority of design ethics education and practice is to be contemplated in terms of action, the attention should be on the designer's freedom of choice.

Thus, Sartre's view lessens the importance of rational character, if rational means evaluating objective conditions as means to specific ends. The evaluation can be objective, but it is necessarily done in light of some ends, which emerge with the designer's free projection in a certain way.

> It follows that my freedom is the unique foundation of values and that nothing, absolutely nothing, justifies me in adopting this or that particular value, this or that particular scale of values. As a being by whom values exist, I am unjustifiable. My freedom is anguished at being the foundation of values while itself without foundation.[45]

However, we can find in Sartre a particular sense of being rational. He strives to awaken people to authentic existence. If authenticity is the ethical value, and being rational means to accept consciously and deliberately the human condition of freedom and responsibility in the way of being, then the major problem is "bad faith"—the way of being that prevents such acceptance.

> A man is not . . . a waiter, or a coward in the same way in which he is six feet tall or blond. . . . If I am six feet tall, that is that. It is a fact no less than that the table is, say, two feet high. Being a coward or a waiter, however, is different: it depends on ever new decisions. I may say: I must leave now—or, I am that way—because I am a waiter, or a coward, as if being a waiter or a coward were a brute fact.

43 Ibid., 702.

44 Ibid., 578.

45 Ibid., 76.

> Actually, this apparent statement of fact veils a decision.[46]

A person is not what he/she is—an architect, an engineer, an artist—in the same way that a pen is a pen. The human being has the possibility to choose his/her way of being. Imposing a role on oneself in a deterministic apprehension of the self is the means by which the individual rejects his/her awareness of his/her freedom and responsibility. Bad faith takes place in the duality of the being of humans, i.e., fact and transcendence. Judgments of ourselves in bad faith "aim at establishing that I am not what I am."[47] Bad faith is to escape responsibility.[48]

> Bad faith . . . consists in not accepting one's responsibilities as a For-itself, in seeking to blame someone or something for what one has done freely oneself, in choosing to assert one's freedom only where it is expedient and on other occasions to seek refuge in a theory of psychological determinism. It is to pretend that one is born with a determined self instead of recognizing that one spends one's life pursuing and making oneself. It is the refusal to face the anguish which accompanies the recognition of our absolute freedom.[49]

Rationality, understood as conscious and deliberate acceptance of freedom as human condition, requires that individuals avoid bad faith, which undermines the authentic acceptance of our freedom and responsibility.

In summary, what a designer does, how he/she acts, determines his/her apparent character. A designer defines him/herself by choosing and acting in a certain way, but at any moment he/she is free to choose and act differently, and this regardless of the past. Humans are not to be apprehended as objects by whoever practices design. Design actors—including the designer—should not be motivated, controlled, or molded into definite roles. Treating people as objects is contrary to treating them as free subjects. The individual's freedom is what constitutes his/her humanity. The designer consist of his/her choices and choosing cannot be avoided; not to choose is still a choice. Even when trapped in inevitable conditions, the designer still chooses how he/she is in those circumstances. In choosing what appears to be only for him/herself, the designer is, in a profound sense, choosing for all humankind.[50] Finally, bad faith is pervasive and poses a persistent threat to authentic life. The designer acts in bad faith whenever he/she regards him/herself as object, with a fixed identity, instead of as a free person.

46 W. Kauffman, *Existentialism from Dostoevsky to Sartre* (New York: The World Publishing Co., 1956), 44.

47 *Being and Nothingness*, 99.

48 Ibid., 110.

49 Barnes, 1992, xxxviii–xxxix.

50 S. Priest, (ed.), *Jean-Paul Sartre: Basic Writings* (London: Routledge, 2001), 41.

Implications for Design Ethics

The major benefit of using such Sartrean view on design ethics is to foster the awareness that the deepest moral dilemmas are not as amenable to being objectively solved as applications of traditional moral theory may suggest. Also, for design ethics to draw upon Sartrean philosophy, no particular process needs to be deployed; authenticity cannot be imposed. The points raised can be translated into practice through an inventive manner. If character is interpreted in a Sartrean way, authenticity should become the center of attention in design ethics. The principles of Sartre's view for design ethics point toward design education and design decision-making, two important aspects to address with regard to the task of fostering authenticity.

Beyond learning processes of ethical reasoning, design students are to be assisted in seeing that such reasoning processes are embodied in larger structures of action. In the delineation of reasons, the role of the design instructor is critical. Causes are constituted as the design student defines a design project. Situations are not simply the objective conditions or facts; rather, situations come into being as the student questions the facts from some point of view. The problems in design situations reveal as much about the designer as about the conditions. A treatment of the facts from conflicting points of view would begin to show the import of choice of starting points in intellectual analysis.

Sartre shows how each of us has a fundamental project. The designer's free acts are always outlined for him/her against the backdrop of his/her fundamental project. The designer can see his/her choices in the self he/she has created, and the projects that give meaning to causes and motives are basic choices of him/herself in his/her ways to respond to the world. Surely design educators can create many opportunities in the treatment of the conditions of the design projects so as to foster the intellectual apprehension of the role of the attitude in the definition of design situations; and part of that apprehension involves seeing that there are alternative definitions and thus alternative attitudes.

Although the fundamental project of the student in design emerges within the conventional background of the design world, he/she still has to choose how to act within the design world; his/her free actions may or may not reinforce the values of the design practice status quo. The important thing is that the individual be conscious of his/her freedom. Thus, the graduate from any design discipline program is in a situation where he/she can choose the kind of professional design practice that he/she wants to work in.

> Every purpose, however individual it may be, is of universal value. . . . In every purpose there is universality, in this sense that every purpose is comprehensible to every man. Not that this or that purpose defines man for ever, but that it may be entertained again and again. . . . In this

> sense we may say that there is a human universality, but it is not something given; it is being perpetually made. I make this universality in choosing myself; I also make it by understanding the purpose of any other man, of whatever epoch.[51]

According to Simone de Beauvoir, the moral implications of Sartre's philosophy lead to what she calls the "ethics of ambiguity."[52] The ability of the designer to deal with uncertainty is important to consider. People who can't handle uncertainty may opt too quickly for design solutions, may be less prepared to apprehend all aspects of a design problem, may accept too rigidly a first solution even if there are better alternatives, and may be less able to recognize the frequent need for compromise and best-fit design solutions. In order to reach moral maturity, the designer has to recognize that there is much he/she cannot know; and yet he/she must act. The problems that complex societies and technologies have to face cannot be addressed with simple solutions, hence the importance for those involved in design decision-making to have a broad view.

Sartre's viewpoint suggests that the individual should strive at understanding and accepting his/her human condition of freedom in order to avoid projecting his/her own choices on circumstances and others. The individual is brought to squarely face his/her decisions, choices, and character.

Taking a Sartrean stance means that the moral character does not consist of objective traits. Neither cause (reason) nor motive (emotion) should be the priority of design ethics. Authenticity may be described as an attitude, since it is a way to engage the world and actions. Thus, Sartre's view is character-oriented and depends on the degree of awareness of an individual's acceptance of his/her freedom and responsibility imbued by that freedom as he/she acts. For design ethics, it means that the designer's attitude in action as authentic or in bad faith is the real focus of moral scrutiny; not whether his/her design actions conform to rules and codes. What has to be stressed is that the meaning of a design action be apprehended in the larger project of which it is a part and the attitude (authenticity or bad faith) with which the action is exercised. What is ultimately at stake is the choice between two possible types of being—authentic or in bad faith—for which there is no possible common decision criterion.

In this sense, a design student might be torn between pursuing the lucrative life of a profitable practice versus working for a humanitarian cause in a non-profit organization. A choice based on one's motives rests itself on a prior choice about what counts as a morally meaningful motive. A careful, rational deliberation is pointless; indeed, if the individual engages in deliberation, it is simply a part of his/her original project to realize motives by means of deliberation rather than some other form of discovery. Deliberating means that "the chips are down."[53]

51 S. Priest, 40.

52 S. de Beauvoir, *Pour une morale de l'ambiguite* (Paris: Gallimard, 1947).

53 *Being and Nothingness*, 581.

Conclusion

When a designer chooses whether or not to accept a way of being in the world through design actions and projects, moral argument, deliberation, and the search for a rational justification come to an end. He/she finds him/herself at a dead end in seeing and doing things, and he/she has to choose from a perspective that is characterized by ignorance, epistemic finitude, existential contingency, and moral uncertainty. With this comes the realization that even if the choice appears to be sure and well made, it does not justify itself and it cannot be supported by an external foundation. It is not possible to put the choice of a way of existing, choosing, and acting on a definite and rational foundation.[54]

For many difficult situations in design, there may be no single and well justified answer other than what Sartre indicates: "you are free, choose, that is, invent."[55] This shows the importance of taking a Sartrean perspective, especially in the disciplines of design, since dilemmas tend to be addressed by applying theory and deductive reasoning processes.[56] Dealing authentically with design dilemmas means that the designer confronts the open-endedness and indeterminacy of the design situation.

What is being offered here is an insight in Sartre's views about human freedom, with the intention to demonstrate how his ideas might complement and improve the standard ethical approaches offered in most design ethics discourses, as well as to enhance ethical life in the world of design.

The value of such a perspective on design ethics is not to provide technical or definite guidance in the resolution of moral dilemmas. Rather, it is to expose the nature of human character and freedom so that hidden assumptions and beliefs about it may be questioned and apprehended in radically different ways. Perhaps such an insight into how the philosophy of Sartre gives human freedom a supreme status can indeed be related to the education and practice of design in regard to ethics.

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54 This is well exposed in the famous example of Sartre's pupil: "Who could help him choose? . . . Nobody . . . I had only one answer to give: "You're free, choose, that is, invent." No general ethics can show you what is to be done; there are no omens in the world. The Catholics will reply, "But there are." Granted—but, in any case, I myself choose the meaning they have." J-P. Sartre, *Existentialism is a Humanism*, trans. by Philip Mairet (New York: Haskell House, 1948), 28.

55 Ibid.

56 This is well exposed in G. Legault, *Professionnalisme et délibération éthique* (Montreal: Presses de l'Universite du Quebec, 2006); and in B. Wasserman, et al.