Conversation, Discourse, and Knowledge

Creating the Conversation

The first article in this issue has several dimensions, all of them significant. "Once More, with Feeling: Design Thinking and Embodied Cognition" by Karin Lindgaard and Heico Wesselius[1] asks us to reconsider design thinking. What is design thinking, really? How can we account for it? And what – if anything – do our accounts have to do with how we use design thinking in a variety of contexts and applications?

Design thinking is, for many, a poor name for a serious process. It is a shorthand term for an iterative problem-solving process. It generally functions when teams of experts work to solve problems on behalf of legitimate problem owners and other stakeholders. The design thinking process typically involves a model in which practitioners go through several steps. In the earliest, seminal versions of the model, practitioners describe the steps as taking place in a problem space and a solution space. In the problem space, the first step is to identify a problem and explicitly define how it is the real cause for which a solution is sought. In the solution space, the second step is to propose a solution and examine the solution in an effort to ensure that the solution will, indeed, solve the causal problem. At this point, most models involve implementation. Most also assume that a serious problem-solving process may require several iterations, with one or more new cycles through each of the two spaces. This is commonly known as the double diamond model.

While this model is well known in design circles, it emerged in several fields. I first saw it in 1988, for example, in the work of Anders Skoe, a former executive at SAS Airlines who had earlier been an economist for Canadian government agencies, later working in the computer industry and the airline industry. Skoe's two books were training manuals for problem-solving practitioners.[2] One was published in Norwegian for the technology sector. The other was a training manual for SITA, the Société Internationale de Télécommunications Aéronautiques. This small manual became highly influential, with worldwide circulation. It travelled because SITA operates in every nation with an airport. SITA manages telecommunications in the airline industry, between and among airlines and air transport service providers, in more than two hundred nations and territories. In developing and refining his model, Skoe worked in more than one hundred and sixty-five nations, later working in the Scandinavian design industry to help design firms solve client problems, while Skoe's trainees moved from SITA into other high-tech industries and consulting firms.

Design thinking operates under several names. In Scandinavia, we sometimes

1 Karin Lindgaard and Heico Wesselius, "Once More, with Feeling: Design Thinking and Embodied Cognition," *She Ji: The Journal of Design, Economics, and Innovation* 3, no. 2 (2017): 83–92, DOI: https://doi.org/10.1016/j.sheji.2017.05.004.

2 Anders Skoe, *Fra problem til løsning: Hvordan lede grupper i planlegging og problemløsning* (Oslo: Teknologisk Institutt, 1992); Anders Skoe, *Creating Customer Care*, 2nd ed. (Sophia Antipolis: SITA Training and Documentation Department, 1997).

http://www.journals.elsevier.com/she-ji-the-journal-of-design-economics-and-innovation
https://doi.org/10.1016/j.sheji.2017.10.001

described the design thinking process as strategic design – the rubric under which I taught courses at the Oslo Business School and later at the Norwegian School of Management. This is the term that Helsinki Design Lab used in a rich series of programs and workshops documented in an open-access library of books and successful projects.[3]

The design firm most closely identified with design thinking in its current form is IDEO.[4]

In addition to method, design thinking involves the concept of stewardship. Bryan Boyer, Justin Cook, and Marco Steinberg describe stewardship as "the art of getting things done amidst a complex and dynamic context. Stewardship is a core ability for agents of change when many minds are involved in conceiving a course of action, and many hands in accomplishing it."[5]

For many readers of *She Ji*, I am restating well known concepts. For others, however, I am opening new issues that warrant a brief background. At this point, in fact, our field would benefit from a comprehensive critical literature review on design thinking that would – to quote Jane Webster and Richard Watson – "analyze the past to prepare for the future."[6] There have been several broad reviews of design thinking in recent years, most notably Lucy Kimbell's two-part article, "Rethinking Design Thinking."[7] At this time, the field would benefit from a new and comprehensive consideration of design thinking. What is it? How should we account for it? What are the appropriate resources and research tools for such an account?

Karin Lindgaard and Heico Wesselius attempt to open that conversation with a conceptual probe that reaches across the boundaries of fields and disciplines to link design, philosophy, and neuroscience.

"Once more, with feeling" is a phrase well known to musicians. Conductors use it when they encourage musicians to work through and transcend technique in a musical work, realizing the music as art rather than a mere technical challenge. To do so, musicians bring embodied cognition to bear on performance. Rehearsal moves at some point from repetition to realization.

Another way to think of embodied cognition is to consider the rich tradition of situated knowledge in the martial arts. The activity cycle that generates situated knowledge moves from practice into theory and back into practice, often supported by reflection and immersion in classics, the arts, philosophy, and an ethical worldview. This is visible, for example, in accounts of swordsmanship – *kendo*, the way of the sword. Modern classics of the genre include Catharina Blomberg's *Heart of the Warrior*,[8] and David Lowry's *Autumn Lightning*.[9]

The Book of Five Rings, written in the 1640s by the Japanese warrior-philosopher Miyamoto Musashi, is one of the greatest attempts to describe the embodied cognition of *kendo*.[10] Thomas Cleary's translation includes another classic description of embodied cognition, the house book of Munenori Yagyū, sword teacher to the shoguns.[11] Drawing on these accounts and others, I have considered these issues in relation to design education and design theory.[12]

Lindgaard, Wesselius, and the commentators attempt to anchor these issues in the larger conversation of embodied cognition and neuroscience. Their article[13] led to a series of conversations and debates among reviewers and editors. Recognizing both virtues and gaps, we decided to publish it to open a serious conversation.

Eight commentators wrote a response: Alissa Antle,[14] Angela Leung and Lin Qiu,[15] Bo Christensen,[16] Roberto Verganti,[17] Lawrence Barsalou,[18] Kees Dorst,[19] and Gabriela Goldschmidt.[20] Lindgaard concludes with a reply.[21]

The opening article and the author's response to the comments remind me of a classic case in which a serious book with gaps contributed to significant advances in science. In 1944, the physicist Erwin Schrödinger wrote a book titled *What is Life?*

3 Bryan Boyer, Justin W. Cook, and Marco Steinberg, *In Studio: Recipes for Systemic Change* (Helsinki: Sitra, The Finnish Innovation Fund, 2011); Bryan Boyer, Justin W. Cook, and Marco Steinberg, *Legible Practises: Six Stories about the Craft of Stewardship* (Helsinki: Sitra, The Finnish Innovation Fund, 2013). SITRA maintains a legacy website for Helsinki Design lab where it is possible to read and download many of their publications: http://www.helsinkidesignlab.org.

4 Maria Camacho, "David Kelley: From Design to Design Thinking at Stanford and IDEO," *She Ji: The Journal of Design, Economics, and Innovation* 2, no. 1 (2016): 88–101, DOI: https://doi.org/10.1016/j.sheji.2016.01.009.

5 Boyer, Cook, and Steinberg, *Legible Practises*, 7.

6 Jane Webster and Richard T. Watson, "Analyzing the Past to Prepare for the Future: Writing a Literature Review," *MIS Quarterly* 26, no. 2 (2002): xiii-xxiii. Stable URL: http://www.jstor.org/stable/4132319.

7 Lucy Kimbell, "Rethinking Design Thinking: Part I," *Design and Culture: The Journal of the Design Studies Forum* 3, no. 3 (2011): 285–306, DOI: https://doi.org/10.2752/175470811X13071166525216; Lucy Kimbell, "Rethinking Design Thinking: Part II," *Design and Culture: The Journal of the Design Studies Forum* 4, no. 2 (2012): 129–48, DOI: https://doi.org/10.2752/175470812X13281948975413.

8 Catharina Blomberg, *The Heart of the Warrior: Origins and Religious Background of the Samurai System in Feudal Japan* (Sandgate: The Japan Library, 1994).

9 David Lowry, *Autumn Lightning: The Education of an American Samurai* (Boston: Shambhala Publications, Inc., 1985).

10 Miyamoto Musashi, *A Book of Five Rings: The Classic Guide to Strategy*, trans. Victor Harris (Woodstock: The Overlook Press, 1974); Miyamoto Musashi, *The Book of Five Rings, Gorin no sho*, trans. Nihon Services Corporation: Bradford J. Brown et al. (New York: Bantam Books, 1982); Miyamoto Musashi, *The Book of Five Rings* (w/ Munenori Kagyu, *Family Traditions on the Art of War*), trans. Thomas Cleary (Boston & London: Shambhala, 1993).

The Physical Aspect of the Living Cell.[22] The book has often been criticized as flawed. Even so, Schrödinger pointed to ideas that helped to shape the development of modern biology. For example, James Watson and Francis Crick both acknowledged the importance of this book on their thinking. Human beings are still trying to understand how chemistry operating under physical law gave rise to biology: Schrödinger pointed the way to an important and still incomplete synthesis.

Leah Ceccarelli describes the importance of *What is Life?* in terms of the conversations to which it gave rise.[23] New fields and new ideas emerge through four ongoing conversations: the rhetoric of science, rhetorical inquiry, the history of science, and interdisciplinarity.[24] As Ceccarelli points out with respect to mistakes in *What is Life?*, a vital author may be wrong and yet fruitful in advancing a new field by helping people to focus on key issues.

Developing the discourse of a field is vital to every living research discipline. In discussing the development of design as a field, Klaus Krippendorff argues that the members of the design field must continually design our own discourse.[25] This is a good beginning for the discourse of design thinking.

Epistemology and Explanatory Knowledge

Among significant debates in the field of design research, the questions of epistemology and explanatory knowledge are particularly important.

Peter Murphy examines these issues in an article on the epistemologies of design research.[26] In his article, Murphy examines the consequences of three epistemological traditions: Platonic-Aristotelian, pragmatist, and postmodern.

Equally important, he explains the necessity of explanation to research.

Philosopher and physicist Mario Bunge describes research as a methodical search for knowledge. "Original research," he writes, "tackles new problems or checks previous findings. Rigorous research is the mark of science, technology, and the 'living' branches of the humanities. It [research] is typically absent from pseudoscience and ideology."[27] For Bunge, exploration, investigation, and inquiry are synonyms for research. Nevertheless, legitimate forms of exploration and inquiry do not in themselves constitute research if they lack methodics and we fail to substantiate inquiry through explanation.

One confusion in design is a tendency to use the terms "knowledge creation" and "research" as though they mean the same thing. They are not the same, and not all knowledge creation is research. Most legitimate ways to create knowledge do not constitute research. Learning creates knowledge. Learning how to do something creates knowledge for the learner. Every day, billions of people learn skills and facts that are new to them. In schools and homes, at work and leisure, these billions gather information and develop capacities that extend their knowledge. While each of these individuals is engaged in knowledge creation, we do not believe that each of these people engages in research.

Practice is a significant method of knowledge creation, creating skill and knowledge for the practitioner, and deepening existing skills and knowledge. Practicing a skill creates applicable knowledge. Consider, for example, experiential knowledge and embodied cognition. Experiential knowledge and embodied cognition allow individuals to function effectively. Because they are properties or attributes of the individuals who experience and embody them, however, they need not be shared with the external world or the larger community to be effective. A skilled surgeon, a great artist, or a superb chef attain and practice mastery through the exercise of tacit knowledge – experiential knowledge – applied through embodied cognition. Others do not know what these individuals know unless they explicitly share it with others in some way.

11 Munenori Yagyū, *Family Traditions on the Art of War* (w/ Miyamoto Musashi, *The Book of Five Rings*), trans. Thomas Cleary (Boston and London: Shambhala, 1993).

12 For example, see Ken Friedman, "Design Science and Design Education," in *The Challenge of Complexity*, ed. Peter McGrory (Helsinki: University of Art and Design Helsinki UIAH, 1997), 54–72. Reprint available at https://www.academia.edu/250736/Friedman._1997._Design_Science_and_Design_Education.

13 Lindgaard and Wesselius, "Once More, with Feeling," 83–92.

14 Alissa N. Antle, "Making Sense of Design Thinking," *She Ji: The Journal of Design, Economics, and Innovation* 3, no. 2 (2017): 92–96, DOI: https://doi.org/10.1016/j.sheji.2017.10.003.

15 Angela K-y Leung and Lin Qiu, "Thinking through Design is Creative and Inspiring: The Why and How," *She Ji: The Journal of Design, Economics, and Innovation* 3, no. 2 (2017): 96–98, DOI: https://doi.org/10.1016/j.sheji.2017.10.004.

16 Bo T. Christiansen, "The Need for New Methods to Study Embodied Designing," *She Ji: The Journal of Design, Economics, and Innovation* 3, no. 2 (2017): 98–100, DOI: https://doi.org/10.1016/j.sheji.2017.10.005.

17 Roberto Verganti, "Design Thinkers Think Like Managers," *She Ji: The Journal of Design, Economics, and Innovation* 3, no. 2 (2017): 100–102, DOI: https://doi.org/10.1016/j.sheji.2017.10.006.

18 Lawrence W. Barsalou, "Define Design Thinking," *She Ji: The Journal of Design, Economics, and Innovation* 3, no. 2 (2017): 102–5, DOI: https://doi.org/10.1016/j.sheji.2017.10.007.

19 Kees Dorst, "Stepping Stones between Design Research and Cognitive Science," *She Ji: The Journal of Design, Economics, and Innovation* 3, no. 2 (2017): 105–6, DOI: https://doi.org/10.1016/j.sheji.2017.10.008.

20 Gabriela Goldschmidt, "Design Thinking: A Method or a Gateway into Design Cognition?," *She Ji: The Journal of Design, Economics, and Innovation* 3, no. 2

(2017): 107–12, DOI: https://dx.doi.org/10.1016/j.sheji.2017.10.009.

21 Karin Lindgaard, "Developing Whole New Perspectives: Change, Creativity, and Process Philosophy," *She Ji: The Journal of Design, Economics, and Innovation* 3, no. 2 (2017): 112–16, DOI: https://doi.org/10.1016/j.sheji.2017.10.010.

22 Erwin Schrödinger, *What is Life? With Mind and Matter, and Autobiographical Sketches* (Cambridge: Cambridge University Press, 2012).

23 Leah Ceccarelli, *Shaping Science with Rhetoric: The Cases of Dobzhansky, Schrödinger, and Wilson* (Chicago: The University of Chicago Press, 2001).

24 Ibid., 168–83.

25 Klaus Krippendorff, "Propositions of Human-Centeredness: A Philosophy for Design," in *Doctoral Education in Design: Foundations for the future: Proceedings of the conference held 8–12 July 2000, La Clusaz,* France, ed. David Durling and Ken Friedman (Stoke-on-Trent: Staffordshire University Press, 2000): 56.

26 Peter Murphy, "Design Research: Aesthetic Epistemology and Explanatory Knowledge," *She Ji: The Journal of Design, Economics, and Innovation* 3, no. 2 (2017): 117–32, DOI: https://doi.org/10.1016/j.sheji.2017.09.002.

27 Mario Bunge, *The Dictionary of Philosophy* (Amherst: Prometheus Books, 1999).

28 Ron Cowen, "This Ancient Babylonian Tablet May Contain the First Evidence of Trigonometry," *Science*, August 24, 2017, http://www.sciencemag.org/news/2017/08/ancient-babylonian-tablet-may-contain-first-evidence-trigonometry; University of New South Wales, "Mathematical Mystery of Ancient Babylonian Clay Tablet Solved," *phys.org*, August 24, 2017, https://phys.org/news/2017-08-mathematical-mystery-ancient-babylonian-clay.html; Maev Kennedy, "Mathematical Secrets of Ancient Tablet Unlocked after Nearly a Century of Study," *The Guardian*, August 24, 2017, https://www.theguardian.com/science/2017/aug/24/mathematical-secrets-of-ancient-tablet-unlocked-after-nearly-a-century-of-study.

Practice creates skill and knowledge for the practitioner. Practicing a skill creates applicable knowledge. For example, practicing a surgical technique creates knowledge for a surgeon that will benefit patients. When football teams practice their passing technique, the team becomes stronger and more skilled.

Research creates knowledge for the larger community of human beings beyond the internal mental or physical world of the individual researcher. When a medical researcher describes the surgical technique through research communication that shows other surgeons how to use the technique, it creates knowledge for all surgeons. As more surgeons learn and apply the technique, it leads to medical progress.

When a football team practices its passing technique, the team becomes stronger and more skilled. When a researcher in athletics examines and develops the strategy of passing techniques, this changes the culture and repertoire of a sport.

Sharing knowledge that helps others to learn creates progress. Nevertheless, there remains a difference between teaching and research. Research involves examining new problems or inquiring into previous findings. If a bright youngster were to discover the Pythagorean theorem without having previously studied mathematics, this would be a remarkable demonstration of intelligence. Nevertheless, it would be a form of learning. It would not constitute research to share something with the world that mathematicians knew long before Pythagoras gave his name to the theorem.[28]

In many cases, original research builds on earlier work. While the earlier foundations are not original, examining well known findings to frame them in a new perspective may be original and even revolutionary. One of the best known and most dramatic examples is a 1905 article by Albert Einstein[29] on Brownian motion in *Annalen der Physik*.

Leucippus and Democritus first stated the fundamentals of atomic theory 2,500 years ago. At the dawn of the 20th century, however, no one had been able to demonstrate the physical reality of atoms. At that time, many physicists and chemists did not accept atomic theory as a responsible description of reality. While many physicists and chemists accepted atomic theory for heuristic purposes and for calculation, they looked on atoms as an idea that no one had been able to demonstrate.

Albert Einstein demonstrated the physical reality of atoms with an argument built on physical and chemical facts that were widely known and accepted by all trained scientists. He built his argument on well known facts, carefully restated and so organized that they led through deductive argument to the necessity of atomic theory. These facts were so well known and widely agreed that Einstein used only four citations – three to his earlier articles in *Annalen der Physik* and one to Gustav Kirchhoff's 1897 *Lectures on Mechanics.*

The article used established facts that had begun to emerge in the 1820s when botanist Robert Brown first observed the phenomenon known as Brownian motion. Beginning with facts known to every working physicist, Einstein convinced most physicists that atoms are, indeed, real rather than a mere heuristic convenience. Prior to this article, the issue had been a matter of controversy. What made the article so interesting is that Einstein based his revolutionary article on physical and chemical facts that had been observed and described for nearly a century. While Einstein received his 1921 Nobel Prize for the photoelectric effect, this paper gave rise to another Nobel Prize in 1926 when Jean Perrin won the prize for experimental verification of Einstein's 1905 article published in 1908.[30] The logical power of this argument demonstrated the physical reality of atomic theory. Perrin followed this with experimental poof.

Here we come to a crucial aspect in Murphy's article: the role of explanation in research.

Research requires explanation. It requires explanatory power and demands a narrative account if it is to produce knowledge for all members of a research field, a discipline, or a profession. This is why we describe research as "a contribution to the knowledge of the field." In this article, Murphy gives particular attention to doctoral research. He distinguishes between description and explanation – linking extended explanation to the demonstration of serious research in a Ph.D. thesis. One criterion of the Ph.D. as a research doctorate involves making "an original contribution to the knowledge of the field" – sometimes described in shorter form as "an original contribution to knowledge." The ability to engage in independent research is the fundamental criterion for awarding a research doctorate. The Ph.D. thesis is a demonstration that the apprentice researcher is able to do research – the "journeyman piece" that warrants admission to the guild of practicing research professionals.

The thesis rests on the importance of explanation, and it requires an epistemological distinction between information and knowledge. We cannot share knowledge directly, mind to mind. We can only share information about what we know. When we engage in research, we learn something that becomes our knowledge. We share information by writing reports, papers, articles, and books, or presenting these less formally in talks. One of the confusing issues in discussions of research is that many of the same initial steps that lead to learning also lead to research.

One key difference between learning and research is that what we learn may be new to us while it is not new to others, as we see in the case of the bright child who rediscovers the Pythagorean theorem. Learning often involves original discovery for the individual that is neither original nor new to the world. This may be research for the individual in the same sense as "collecting of information about a particular subject."[31] This kind of research does not warrant publication or a research degree.

Another key difference between learning and research is that research involves information that is new to the others with whom we share it. Serious research enables others to learn in turn from our questions, our methods, or our conclusions.

Research creates knowledge for researchers and information for the field. When other members of the field integrate this information into their knowledge, it becomes the knowledge of the field. In his article, Peter Murphy offers a rich overview of the epistemological challenges of design research, locating them in three epistemological traditions.

It is possible to frame design research in other ways. Murphy focuses on John Dewey's approach to pragmatism; one could also examine George Herbert Mead's approach.[32] Mead's work led in turn to symbolic interactionism, and to the constructivist tradition. Hermeneutics offers another useful epistemology for grappling with design as meaningful communication.

There are other ways to understand the world – but not all of these involve research. Art offers a rich and legitimate approach to understanding the world – it involves revelation, not explanation. Murphy's elegant distinctions honor the necessities of art without neglecting the necessities of explanation in research epistemology. Murphy articulates a useful critique of the failure to demonstrate explanatory knowledge in what is sometimes labeled "practice-based research." Much of this work is not research at all: it is a justification for advancing the careers of people whose work does not warrant a Ph.D. by redefining research in implausible ways. Murphy demonstrates why this is so, and why many Ph.D. awards in architecture, art, and design should be studio master's degrees rather than research doctorates.

29 Albert Einstein, *Einstein's Miraculous Year: Five Papers that Changed the Face of Physics*, edited and introduced by John Stachel (Princeton: Princeton University Press, 1998), 71–98.

30 John Stachel discusses Einstein's article in depth in "Einstein on Brownian Motion." Stachel, *Einstein's Miraculous Year*, 73–84.

31 Merriam-Webster, s.v. "research," accessed November 3, 2017, https://www.merriam-webster.com/dictionary/research.

32 For example, see George Herbert Mead, *Mind, Self, and Society: The Definitive Edition*, ed. Charles W. Morris (1934; Chicago: The University of Chicago Press, 2015); Herbert Blumer, *George Herbert Mead and Human Conduct*, ed. Thomas J. Morrione (Walnut Creek: AltaMira Press, 2004).

Epistemological clarity reminds us that words cannot explain all wisdom. The ancient Chinese master Han Shan[33] describes this in a poem:

A master of the brush and the sword
met three illustrious lords
in the East his advice was ignored
in the West his valor wasn't honored
he mastered the brush and the sword
he mastered the sword and the brush
today now that he's old
what's left isn't worth saying[34]

This is revelation rather than explanation.

But Han Shan didn't explain and he was not involved in research. He followed a humble path practicing Zen and avoiding recognition. Han Shan wrote his poetry on rocks and walls, working in a monastery kitchen to earn a living. In Han Shan's day, China had a powerful and well organized civil service based on lengthy examinations for admission and promotion to higher ranks. For those who chose explanation, the classics, and the law, this was the path to advancement – not unlike today's university research system. Han Shan chose another path, and he did not confuse the two epistemological traditions, demanding a civil service career while living the life of an artist.

Legend has it that Han Shan and his friend Shih Te vanished into the mountains when fame sought them out, disappearing rather than accept honors and rewards. Han Shan would not have expected a Ph.D. for his poetry, and he would not want promotion to professor as a paid academic.

Those who engage in research must think deeply on the epistemological challenges that we face in design inquiry. To advance requires that we explain what we think and do. Peter Murphy's article offers a compact symposium on the issues. Murphy invites us to reflect on philosophical traditions from the time of Plato and Aristotle to the present day.

Reason, argument, and explanation are central to research. If design research is to flourish, we must give serious attention to the challenges they pose.

Strategic Design in China

The growth of China as a great power is the focus of international attention in geopolitical and economic terms. While China is the world's second largest economy and the world's largest manufacturing nation, however, there has been little attention to the role of design in the Chinese innovation system. So far, there have been few extensive studies on design in China, notably *China's Design Revolution* by Lorraine Justice.[35]

In this issue, Sylvia Xihui Liu and Cees de Bont examine some of the key factors that affect the uptake and use of design in Chinese industry.[36] Liu and de Bont note that design plays a key role in the innovation network of an advanced industrial economy. The role of design in China today requires research and attention.

In a recent interview for the China Global Television Network, Martin Jacques[37] stated that we are asking the wrong question if we ask when China will begin to innovate.[38] In his interview, Jacques argues that China has become a hub of significant innovation in many fields. It is now the world leader in areas such as computing, and a powerhouse for several kinds of advanced manufacturing.

As China's firms begin to realize the potential of design-based innovation, it is necessary to recognize and overcome barriers. This article considers the challenges that they face.

33 Gary Snyder, "Preface to the Poems of Han Shan," *A Range of Poems* (London: Fulcrum Books, 1967), 32–34.

34 Han Shan, *The Collected Songs of Cold Mountain*, trans. Red Pine (fl. 750–850; Port Townsend: Copper Canyon Press, 2000), 45.

35 Lorraine Justice, *China's Design Revolution* (Cambridge, MA: The MIT Press, 2012).

36 Sylvia Xihui Liu and Cees de Bont, "Barriers to Strategic Design: A Perspective from China," *She Ji: The Journal of Design, Economics, and Innovation* 3, no. 2 (2017): 133–45, DOI: https://doi.org/10.1016/j.sheji.2017.09.003.

37 For background, see Martin Jacques, *When China Rules the World: The End of the Western World and the Birth of a New Global Order*, 2nd ed. (London: Penguin Books, 2012), See also http://www.martinjacques.com.

38 Anand Naidoo, "The Heat: Author Martin Jacques Discusses China and Global Issues," *cgtn.com*, last modified October 20, 2017, https://america.cgtn.com/2017/10/19/the-heat-author-martin-jacques-discusses-china-global-issues.

Journals and Disciplines

More than three and half centuries have passed since the world saw the birth of the first scientific journal. In 1665, the Royal Society published the first issue of *Philosophical Transactions: Giving Some Account of the Present Undertakings, Studies, and Labours of the Ingenious In many Considerable Parts of the World*. Today, *Philosophical Transactions* is the world's oldest journal, and among the most important.[39] The importance of the journal as a medium of scientific and scholarly communication involves more than recording the history and growth of science. Journals shape scientific discourse, and they shape the communities within which discourse takes place.[40]

Two decades ago, Klaus Krippendorff discussed the importance of serious journals as a crucial necessity for the development of design as a healthy research discipline.[41] At the close of the 20th century, the field had only a handful of serious journals. These included *Design Studies*, *Design Issues*, and the oldest among them, *Visible Language*. Today, there are several dozen journals for design research, many of them serious.[42]

In this issue, Stéphane Vial discusses the development of design journals in France, and the role they play in shaping a discipline.[43] Vial is editor-in-chief of *Sciences du Design*, the first international, French language design research journal in France. One fascinating aspect of this article is the relationship of a journal title to the framing of the discipline and field to which the journal gives voice. The relationship between a journal name and the frame that the journal occupies is of special interest to the editors of *She Ji*. We gave deep thought to this issue when launching our own journal.[44]

In considering the birth and development of *Sciences du Design*, it is interesting to recall an intriguing historical precedent. The *Journal des Savans* was launched in France two months before the launch of *Philosophical Transactions* in London. It never grew into a fully-fledged scientific journal. With a major focus on book reviews and literature, political and religious opposition forced it to become a tepid journal, and it closed only three years later.[45] *Sciences du Design* has had a livelier beginning, and we expect that it will have a successful future in the growing community of design research journals.

Ken Friedman
Editor-in-Chief

39 Daniel Boorstin, *The Discoverers: A History of Man's Search to Know His World and Himself* (New York: Random House, 1985), 391–94; The Royal Society, "About Philosophical Transactions A," accessed November 3, 2017, http://rsta.royalsocietypublishing.org/about; Peter Burke, *A Social History of Knowledge: From Gutenberg to Diderot* (Cambridge: Polity, 2000), 168–69.

40 Peter Dear, "Totius in Verba: Rhetoric and Authority in the Early Royal Society," in *The Scientific Enterprise in Early Modern Europe: Readings from Isis*, ed. Peter Dear (Chicago: The University of Chicago Press, 1997), 255–72.

41 Klaus Krippendorff, "A Field for Growing Doctorates in Design?," in *Doctoral Education in Design: Proceedings of the Ohio State Conference*, ed. Richard Buchanan et al. (Pittsburgh: School of Design, Carnegie Mellon University, 1999), 207–24.

42 For a recent study of leading design journals, see Gerda Gemser, Cees de Bont, Paul Hekkert, and Ken Friedman, "Quality Perceptions of Design Journals: The Design Scholars' Perspective," *Design Studies* 33, no. 1 (2012): 4–23, DOI: https://doi.org/10.1016/j.destud.2011.09.001.

43 Stéphane Vial, "A Look at Design Research in France through Design Journals: Building a Design Discipline," *She Ji: The Journal of Design, Economics, and Innovation* 3, no. 2 (2017): 146–56, DOI: https://doi.org/10.1016/j.sheji.2017.10.002.

44 Ken Friedman, Yongqi Lou, and Jin Ma, "She Ji: The Journal of Design, Economics, and Innovation: Editorial," *She Ji: The Journal of Design, Economics, and Innovation* 1 (2015): 1–4, DOI: https://doi.org/10.1016/j.sheji.2015.09.002.

45 Boorstin, *The Discoverers*, 393.