The Epistemology of the Unspoken: On the Concept of Tacit Knowledge in Contemporary Design Research
Claudia Mareis

Introduction

The concept of tacit knowledge has advanced to become a prolific guiding principle in contemporary design research. In their attempts to describe knowledge within the scope of design, design researchers frequently draw on this concept and its related references. They attest that design is influenced by tacit knowledge in a distinctive way. However, in regard to the corresponding provisions of this form of knowledge, we must recognize that we cannot attain an understanding of the complexity of tacit knowledge using only philosophical categorizations or only the analysis of individual creative practices. Even more, we must recognize that tacit knowledge is not merely a "natural" phenomenon but is created in a social and discursive sense. In this article, we examine tacit knowledge from a cultural research perspective and as a sociocultural phenomenon, using the concepts and lenses of Michael Polanyi and Pierre Bourdieu.

Limits of the Spoken

In *The Practices of Everyday Life*, French philosopher Michel de Certeau states that a particular problem arises when theory is no longer a discussion about other discussions, as is usually the case, but tends to press forward into an area in which discussion no longer exists:

> There is a sudden unevenness of terrain: the ground on which verbal language rests begins to fail. The theorizing operation finds itself at the limits of the terrain where it normally functions, like an automobile at the edge of a cliff. Beyond and below lies the ocean.[1]

Design researchers currently testing the model of practice-based design research have been able to experience something similar. Such research deals with a methodology "in which the professional and/or designerly practices of art, design, or architecture play an instrumental part in an inquiry."[2] As these researchers

1   Michel de Certeau, *The Practice of Everyday Life* (Berkeley and Los Angeles: University of California Press, 1984), 61.
2   Chris Rust, Judith Mottram, and Jeremy Till, AHRC Research Review Practice-Led Research in Art, *Design and Architecture* (Swindon: Arts & Humanities Research Council, 2007), 11.

have experienced, "[t]he ground on which verbal language rests" apparently also diminishes when design practices and design objects are regarded as knowledge practices or as "epistemic objects."[3]

The launch of "practice as research" goes hand in hand with many controversial questions in design research. In particular, the inter-subjective and objective communicability of such research findings, which are created through practical actions, is debated.[4] However, verbalization is not the only component that reaches its limits in the mode of practice-based design research; even the question about a specific knowledge culture of design—about specific "designerly ways of knowing"[5] —quickly leads to the diagnosis of an unspoken knowledge on a theoretic-reflexive level. Despite its current explosive nature, this diagnosis is not new. David Pye already stated in the early 1960s that "the essential nature of the activity seems not to be understood except by designers, and they have not formulated what they know."[6] To date, the tacit dimension of knowledge still presents a particular challenge to design research. On the significance of tacit knowledge, Kristina Niedderer notes:

> [...] tacit knowledge plays an important role both in the research process and in evaluating and communicating research outcomes. [...] tacit knowledge seems important for the generation and application as well as the experience and judgment of research and its results, and for creating new experiences, abilities, and knowledge.[7]

The tacit relativity of knowledge, however, is not to be understood one-dimensionally, but must be interpreted in several ways: On the one hand, the difficulty of being able to give sufficient information about practical activities refers to insights into the sociology of knowledge, according to which our knowledge and skills always consist of tacit elements that resist verbalization. This paradox of knowledge has been described by, among others, Michael Polanyi and Donald Schön. On the other hand is the speechlessness to which practitioners have often attested, but which is also linked with normative language specifications and traditional value discourses, like those described in Bourdieu's habitus concept. With Bourdieu, the question arises about the extent to which designers actually are not able to articulate their practical knowledge verbally, or whether in recognizing those limits, an acquired elevation of speech is not denoted and pursued because of certain habituation processes in design education and design practice. The latter might possibly be asserted all the more the further the discipline evades a spoken discourse.

3   Hans-Jörg Rheinberger, *Toward a History of Epistemic Things: Synthesizing Proteins in the Test Tube* (Stanford, CA: Stanford University Press, 1997). Boris Ewenstein and Jennifer Whyte, "Knowledge Practices in Design: The Role of Visual Representations as 'Epistemic Objects,'" *Organization Studies* vol. 30, no. 7 (2009): 7–30.

4   Stephen Scrivener, "The Art Object Does Not Embody a Form of Knowledge," *Working Papers in Art and Design* vol. 2 (2002), http://www.herts.ac.uk/artdes1/research/papers/wpades/vol2/scrivener.html (accessed July 20, 2011). Michael Biggs, "Editorial: The Role of the Artefact in Art and Design Research," *Working Papers in Art and Design* vol. 3 (2004), http://sitem.herts.ac.uk/artdesa_research/papers/wpades/vol3/mbintro.html (accessed July 20, 2011).

5   Nigel Cross, "Designerly Ways of Knowing," *Design Studies* vol. 3, no. 4 (1982): 221–27. Idem, "Designerly Ways of Knowing. Design Discipline Versus Design Science," *Design Issues* vol. 17, no. 3 (2001): 49–55.

6   David Pye, *The Nature of Design* (London: Studio Vista, 1972 [1964]), 7.

7   Kristina Niedderer, "Mapping the Meaning of Knowledge in Design Research," *Design Research Quarterly* vol. 2, no. 2 (2007): 6.

8   Nigel Cross, *Designerly Ways of Knowing* (London: Springer, 2006), 100-1.

9   cf. Claudia Mareis, *Design als Wissenskultur. Interferenzen zwischen Design- und Wissensdiskursen seit 1960* (Bielefeld: Transcript, 2011), 34–54.

10   Jones wrote: "In the 1970s, I reacted against design methods. I dislike the machine language, the behaviorism, the continual attempt to fix the whole of life into a logical framework." Cf. John Christopher Jones, "How My Thoughts About Design Methods Have Changed During the Years," *Design Methods and Theories* vol. 11, no. 1 (1977): 50–62.

11   e.g., Brian Lawson, *How Designers Think: The Design Process Demystified* (Oxford: Architectural Press, 1983). Peter G. Rowe, *Design Thinking* (Cambridge, MA: MIT Press, 1987).

12   e.g., Christopher Frayling, "Research in Art & Design," *Research Paper Royal College of Art London* vol. 1, no. 1 (1993/94). Bruce Archer, "The Nature of Research," *Co-Design Journal* (January 1995): 6–13. Nigel Cross, "Design Research: A Disciplined Conversation," *Design Issues* vol. 15, no. 2 (1999): 5–10. Alain Findeli, "Die projektgeleitete Forschung: Eine Methode der Designforschung," in *Erstes Design Forschungssymposium*, ed. Ralf Michel (Zürich: Swiss Design Network, 2004), 40–51. Wolfgang Jonas, "Design Research and its Meaning to the Methodological Development of the Discipline," in *Design Research Now. Essays and Selected Projects*, ed. Ralf Michel (Basel: Birkhäuser, 2007), 187–206.

13   Fatina Saikaly, "Approaches to design research: towards the designerly way," *Proceedings of The 6th International Conference of the European Academy of Design, Design System Evolution* (The University of the Arts Bremen, March 29-31, 2005), http://www.verhaag.net/ead06/fullpapers/ead06_id187_2.pdf (accessed July 20, 2011).

14   Michael Polanyi, *The Tacit Dimension* (Gloucester, MA: Peter Smith, 1983 [1966]).

15   Hubert L. Dreyfus and Stuart Dreyfus, *Mind over Machine. The Power of Human Intuition and Expertise in the Era of the Computer* (New York: Free Press, 1986).

Tacit Knowledge as a Theme of Design Research

Tacit knowledge and design are commonly linked to a perspective either on characteristic design activities, such as sketching or modeling, or on more general activities, such as showing, presenting, mimicking, and trying out. What these attributes have in common is that they refer to non-verbal activities—meaning visual, aesthetic, haptic, performative, or motoric and gestural aspects—in and on which knowledge in design should manifest itself in a non-verbal manner. In this regard, Cross's thesis statement can be understood so that "design knowledge" is to be located not only on a verbal level, but also in designers, design processes, and design objects.[8]

One reason for the strong present interest in the concept of tacit knowledge possibly lies in the past—in the history of design methodology. During the 1960s, a promising test to establish a systematic design methodology took place with the *design methods movement*. Primarily favored (although not exclusively) were logical-rational concepts and methods, by means of which the systematics and characteristics of the design should be assessed.[9] However, because of this orientation, the movement was soon criticized. The criticism of the design methodology was directed at the absence of practical relevance and at its tendency to overly theoreticize design. Design methodology had gone from a practically motivated matter and mutated into an abstract theoretical venture, as John Christopher Jones tellingly concluded in 1977.[10] Against the background of the criticism on rational design, and ultimately even on knowledge concepts, we can observe that design researchers increasingly search for practical approaches to the research of design processes. As a result, there is less consideration of the "rational" aspects of design than of the "creative," "intuitive," and "tacit" aspects, along with the alleged design-specific manner of knowledge production.[11] No later than at the start of the 1990s, a close link between design research and design practice was postulated—both on an institutional level and under a disciplinary pretense.[12] Making this connection in exemplary form, Fatina Saikaly notes that "it could be argued that the main aspects of the practice-based approach are leading toward the definition of a designerly way of researching […] since it advances knowledge partly by means of design practice."[13]

To assess practical, experiential knowledge, the concepts of design research for tacit, non-propositional knowledge consequently must be used. Particularly noteworthy here is Michael Polanyi, who identified practical expertise and skills as a form of knowledge that cannot always be articulated or verbalized.[14] On the basis of this insight, Hubert and Stuart Dreyfus established in the late 1980s a five-stage model that describes how expertise could be gained by the internalization of rule sets.[15] At about the same time,

Donald Schön suggested that practical knowledge of designers can be understood using the concept of the "reflective practitioner" or with the mode of a "reflection-in-action."[16] He also referred to the tacit knowledge that professional experts generally have but can hardly ever articulate. Following Polanyi, he suggests that "the best professionals know more than they can put in words."[17]

The Semantics of Tacit Knowledge
The debates about practice-based design research have been accompanied by their own epistemological semantics. Familiar expressions include "design knowledge" and "designerly ways of knowing,"[18] "design thinking,"[19] "sensuous knowledge," and "experiential knowledge."[20] Further epistemological terms accompany these debates because an intensive debate about experiential knowledge has been raging in other fields of practice and disciplines since the 1980s. Examples of these terms are "personal knowledge,"[21] "knowledge of familiarity,"[22] "tacit knowledge,"[23] or "situated cognition."[24]

What these, in principle, inconsistent terms share, is that they are based on a similar concept of knowledge that is gained and applied via practical measures and that is, to a great extent, person- and situation-oriented (particularly in the areas of work, technology, and economics). According to the German sociologist Fritz Böhle, the reorientation of experiential knowledge must not result in an undifferentiated status towards the increasing scientification of society, but must focus on its limits and search for ways to consider experiential knowledge in the case of, or despite, scientification.[25] In this regard, the terms "expertise," "connoisseurship," and "intuition" play a central role. Strictly speaking, all of the terms named are not necessarily to be understood as synonyms for "tacit knowledge." They originate from knowledge debates in philosophy, psychology, or education and illustrate correspondingly very different aspects in each. What they do share, though, is that they address central aspects and attributes that are also significant in connection with the analysis of tacit knowledge (e.g., the aspect of the sensuous and physical experience). At the same time, the wealth of terms also clearly indicates how far the complex dimensions of tacit knowledge must be projected and how hazy its borders remain.

Polanyi's Dimension of Tacit Knowledge
Michael Polanyi is considered to be the most influential, although not the sole, founder of the coherent theory of tacit knowledge. The foundation for this is already compiled in his major philosophical work, *Personal Knowledge* (1958). In 1966, he published the articles of his Terry Lecture (held 1962 at Yale University) in the book *The Tacit Dimension*. There, the quote frequently linked to tacit knowledge,

16   Donald Schön, *The Reflective Practitioner. How Professionals Think in Action* (New York: Basic Books, 1983), 68-69.
17   Schön, *The Reflective Practitioner* (1983), book cover.
18   Nigel Cross, "Designerly Ways of Knowing," *Design Studies* vol. 3, no. 4 (1982): 221–27.
19   Rowe, *Design Thinking* (1987).
20   "Sensuous Knowledge" is the title of an annually held conference on design research at the Bergen National Academy of the Arts: www.sensuousknowledge.org. "Experiential Knowledge" is the theme of a special interest group of the Design Research Society and the title of a series of resulting conferences: www.experientialknowledge.org (accessed November 4, 2011).
21   Michael Polanyi, *Personal Knowledge. Towards a Post-Critical Philosophy* (Chicago: University of Chicago Press, 1974 [1958]).
22   Bo Göranzon and Ingela Josefson (eds.), *Knowledge, Skill and Artificial Intelligence* (Berlin: Springer, 1988).
23   Stephen Turner, *The Social Theory of Practices. Tradition, Tacit Knowledge and Presuppositions* (Cambridge, MA: Polity Press, 1995).
24   David Kirshner and James A. Whitson, *Situated Cognition. Social, Semiotic, and Psychological Perspectives* (Mahwah, NJ: Lawrence Erlbaum Associates, 1997).
25   Fritz Böhle, "Wissenschaft und Erfahrungswissen," in *Wissenschaft in der Wissensgesellschaft*, eds. Stefan Böschen and Ingo Schulz-Schaeffer (Wiesbaden: Westdeutscher Verlag, 2003), 143–77.

"we can know more, than we can tell," can be found.[26] According to Polanyi, human knowledge always consists of certain tacit (i.e., unspoken or unknown) components. These components enable human beings to ride a bicycle, play a musical instrument, or recognize individual faces in a crowd, without being able to say precisely how they do this. Polanyi supports his statements on Gilbert Ryle's differentiation between "knowing that" and "knowing how" and presents human expertise correspondingly as a form of practical knowledge.[27] He thereby develops a knowledge and consciousness theory concerned not with a static knowledge result *(knowledge)*, but with the act or the process of recognition and perception *(knowing)*; he therefore assigns the human body and its senses a central position in the production of knowledge.[28]

Polanyi uses very different examples in *The Tacit Dimension* to explain specifically how certain intelligent processes exist or are applied subconsciously (subliminally or internalized), despite limitations in our capacity to articulate or formalize these processes. For him, the dimension of tacit knowledge production incorporates the tacit components of knowledge and expertise, including such constituents as emotions, physiognomic perception (i.e., individual elements are completed to make a whole), and rule practicing that is internalized and perceived as "intuitive" (through the constant repetition of a practical activity), as well as non-verbalized but guiding morals and values within the scope of scientific knowledge production. With "implicit-tacit," Polanyi does not necessarily signify the opposite of "explicit-verbal," but the term can be interpreted as the opposite of "focal awareness," for instance in Gestalt formation.[29] A further interpretation of the phrase, "we can know more then we can tell," is that tacit knowledge, although generally not verbalized, can nevertheless be detected in behavior. According to this interpretation, "implicit" would be understood as the opposite of "articulable."[30] Thus, experienced craftspeople perhaps are not able to completely articulate their expertise, but they can often demonstrate it.

Polanyi, who had initially studied medicine and went on to become a distinguished scientist in physical chemistry, draws on an unorthodox reference tool for his epistemological work. He touches upon various discourses and disciplines, although he rarely explicitly explains these references. Essential points of contact certainly exist to Gestalt psychology,[31] as well as to behavioristic experiments in the 1950s on emotional conditioning and subliminal perception.[32] Particularly the ability described in Gestalt psychology to understand fragments as a whole of which they are a part and—depending on the focus—to interpret things in one way or the other present important intellectual abilities. In regard to this ability, Polanyi therefore spoke about a "from-to structure" of knowledge: "In an act of tacit knowing we attend from something for attending to something else."[33]

26   Polanyi, *The Tacit Dimension* (1983), 4 (italics in the original text).
27   Gilbert Ryle, *The Concept of Mind* (Chicago: University of Chicago Press, 2002 [1949]).
28   cf. Georg Hans Neuweg, *Könnerschaft und implizites Wissen. Zur lehr-lerntheoretischen Bedeutung der Erkenntnis- und Wissenstheorie Michael Polanyis* (Münster: Waxmann, 2004 [1999]), 134.
29   Neuweg, *Könnerschaft und implizites Wissen* (2004), 138.
30   Ibid.
31   Polanyi, *The Tacit Dimension* (1983), 6.
32   Polanyi, *The Tacit Dimension* (1983), 8-9.
33   Ibid., 10.

Polanyi's statements on tacit knowledge are not in the least to be understood as timelessly valid, ahistorical theorems. They are decidedly influenced by concrete historical and political conditions and by personal cultural and religious beliefs. Thus, he repeatedly criticized an ideologically based knowledge theory, as it was taught in the former Soviet Union under Stalin.[34] In regard to this theory, he searched for ways and opportunities to formulate an (at least in his opinion) ideology-free, holistic knowledge model, yet one still bound to values and traditions, for "Western" sciences.

In summary, we can say that both theoretical knowledge and practical knowledge belong to the dimension of tacit knowledge for Polanyi; but in addition, and perhaps even more-so, he includes internalized values and worldly wisdom, along with ideological and religious aspects.[35] He thus emphasizes the fact that tacit knowledge—even knowledge in any sense—is not only influenced by moral, cultural, and scientific authorities, but also is first realized within the social boundaries generated by them.

Expertise and Connoisseurship
Although great importance is attached to the concept of "tacit knowledge" in design research,[36] rarely discussed is the extent to which the phenomenon, "we can know more than we can tell," can also be understood as an effect of social influence and habit. In this reading, tacit knowledge is to be understood not only as an individual form of practiced, internalized knowledge and expertise, but also as collectively perpetuated knowledge carried in standards, values, and traditions. With the aid of the terms "expertise" and "connoisseurship," which are frequently linked to the concept of tacit knowledge and also critically argued, this effect can perhaps be discussed best.[37]

Polanyi already specified a direct relationship between tacit knowledge, expertise, and connoisseurship.[38] In current texts on practice-based design research, this relationship is indicated but is only rarely expounded in terms of the social dimension of knowledge. Instead, the focus is frequently only on the alleged "professional" aspect of a practiced connoisseurship; as such, it is considered separately, detached from the social parameters in which connoisseurship is initially learned and communicated. In turn, Niedderer writes: "Tacit knowledge is an important requirement for achieving best results in research and practice, which is associated with expertise and connoisseurship."[39] Moreover, she notes that "connoisseurship […] is referring to an ability for very fine (qualitative) discrimination that is (usually) beyond scientific measurement and that is acquired through extensive training."[40] Niedderer does not elaborate on the relationship between design practice, tacit knowledge, expertise, and connoisseurship in her text, but the impression arises that these phenomena overlap in

34   Ibid., 3.
35   cf. Polanyi, *The Tacit Dimension* (1983), 92. See also on Polanyi's religious orientation: Mark T. Mitchell, Michael Polanyi. *The Art of Knowing* (Wilmington, DE: Intercollegiate Studies Institute, 2006), 10ff.
36   e.g., Chris Rust, "Design Enquiry: Tacit Knowledge and Invention in Science," *Design Issues* vol. 20, no. 4 (2004): 76–85. Niedderer, "Mapping the Meaning of Knowledge in Design Research," (2007), 1–13.
37   e.g., Griselda Pollock, *Differencing the Canon. Feminism and the Writing of Art's Histories* (London: Routledge, 1999), 13ff, 136.
38   Polanyi, *Personal Knowledge* (1974), 54-55.
39   Niedderer, "Mapping the Meaning of Knowledge in Design Research," (2007), 6.
40   Ibid.

practice-based design research and manifest themselves there as components of knowledge. Thus, neither "expertise" nor "connoisseurship" are critically questioned or developed as (historical) concepts.

To explain the manner in which expertise and connoisseurship are related to the habituation and perpetuation of social standards, values, and traditions, one can again refer back to Polanyi. He notes that connoisseurship, like many other practical competencies, can be communicated only by using example, but not by using rules.[41] Elsewhere, connoisseurship is described as an "expert's eye," which simultaneously pays attention to a variety of nuanced, in principle indescribable details and quality characteristics; using this impression, the expert is able to refer to previously experienced, but not consciously present, situations.[42] According to Polanyi, the expert thus sees a rich panorama of characteristic physiognomies there, where the eye of the amateur sees nothing of significance.[43] As an example, he presents the diagnostic competence of doctors: "The medical diagnostician's skill is as much an art of doing as it is an art of knowing."[44] The same expert eye can also be attributed to art and wine experts, meteorologists, sailors, or botanists; to a certain extent, Polanyi even attests that scientists have an anticipatory skill in the search for relevant scientific issues.[45]

A fundamental aspect in the analysis of "expertise" and "connoisseurship" is, as Neuweg states, the fact that the necessary skills are acquired in a direct encounter with connoisseurs and expert cultures.[46] Such a teaching-learning relationship is particularly pivotal where experience is to be gained by means of imitation, as in design training. To date, this teaching-learning preferably takes place in a practical, atelier-like training situation and is often realized according to the model of a master-apprentice relationship. However, the transfer of expertise and connoisseurship can, according to Polanyi, hardly be communicated by means of verbalized rules; instead, it must be demonstrated on the basis of examples: "An art which cannot be specified in detail cannot be transmitted by prescription, since no prescription for it exists. It can be passed only by example from master to apprentice."[47]

According to Polanyi, this form of transfer can only be achieved through an initially uncritical imitation of existing (local) traditions and of the authorities of a field. He wrote: "To learn by example is to submit to authority. You follow your master because you trust [that] manner of doing things, even when you cannot analyse and account in detail for effectiveness."[48] But even while the apprentice surrenders blindly to the authority of the master, the master, in turn, "blindly" follows certain rules that can rarely be designated or articulated as such:

41   Polanyi, *Personal Knowledge* (1974), 54.
42   Neuweg, *Könnerschaft und implizites Wissen* (2004), 176-77.
43   Michael Polanyi, "Skills and Connoisseurship," in *Atti del Congresso di Metodologia*, ed. F. de Silva (Turin: 1952), 393.
44   Polanyi, *Personal Knowledge* (1974), 54.
45   Polanyi, *The Tacit Dimension* (1983), 21–25.
46   Neuweg, *Könnerschaft und implizites Wissen* (2004), 378.
47   Polanyi, *Personal Knowledge* (1974), 53.
48   Ibid.

By watching the master and emulating his efforts in the presence of his example, the apprentice unconsciously picks up the rules of the art, including those which are not explicitly known to the master himself. These hidden rules can be assimilated only by a person who surrenders himself to that extent uncritically to the imitation of another.[49]

Polanyi concludes that a society that wants to maintain a repertoire on personal, tacit knowledge must be committed to tradition. In his work, he strove in an almost paradoxical manner to uphold traditions and value systems, while also exposing how implicit limits of knowledge manifest as traditional values during the acquisition and transfer of knowledge and how they are perpetuated through authoritative relationships.

Social Habituation Based on Bourdieu

Polanyi's insights on the social constructs that limit individual behavior raise the question of what is required to generate a stable, collective anchoring of values, traditions, and standards that influence individual human thought and behavior. This question has been particularly handled by the French sociologist, Pierre Bourdieu. His theories regarding this question can be productive for the critical designation of a tacit dimension of knowledge in design. Bourdieu's habitus concept exhibits numerous points of contact to Polanyi's statements on tacit knowledge, although Bourdieu ultimately showed less interest in the continuation of traditions and value systems than in individual freedom of decision and choice.[50]

Similar to Polanyi, who establishes the dimension of tacit knowledge in different, intertwined levels of thought and action, Bourdieu assumes that an analytical difference between perception, thought, and action is not sustainable. According to Bourdieu, habituated perception, thought, and action schemes intertwine themselves in individual practices and consistently act together as implicit structures, or as "social sense:"

> The habitus, the durably installed generative principle of regulated improvisations, produces practices which tend to reproduce the regularities immanent in the objective conditions of the production of their generative principle, while adjusting to the demands inscribed as objective potentialities in the situation, as defined by the cognitive and motivating structures making up the habitus.[51]

Bourdieu developed the habitus concept subsequent to Marcel Mauss's terms of "body techniques" (*techniques du corps*) and "hexis"[52] and Norbert Elias's writings on the genesis of civilization.[53] The habitus as conceptualized by Bourdieu comprises the all

49   Ibid.
50   cf. Pierre Bourdieu, *Outline of a Theory of Practice* (Cambridge: Cambridge University Press, 2010 [1977]), 78–95.
51   Bourdieu, *Outline of a Theory of Practice* (2010), 78.
52   Marcel Mauss, "Les Techniques du corps," *Journal de Psychologie* 32 (1934): 3–4. Reprinted in Marcel Mauss, *Sociologie et anthropologie* (Paris: PUF, 1936).
53   Norbert Elias, *The Civilizing Process – The History of Manners* (vol. I) and *The Civilizing Process – State Formation and Civilization* (vol. II) (Oxford: Blackwell, 1969 and 1982).

habits, customs, physical abilities, aesthetic and cultural prefer-ences, and additional *non-discursive* aspects of knowledge that are considered self-evident to a specific social group.[54] For him, the deciding factor is the assumption that habitus is not inherent, but instead is based on learned individual and collective experiences, which deposit themselves in an individual as determining percep-tion, thought, and action schemes. From early childhood on, the limits of our individual behavior, perception, and thought are therefore determined by predetermined material and cultural exis-tential conditions, by social class, and by gender.

Nevertheless, the genesis (or "becoming," from the Greek) of the habitus of the players is usually "unconscious" because it becomes, as a matter of course, something that is experienced as "natural." According to Bourdieu, "[t]he 'unconscious' is never anything other than the forgetting of history which history produces by incorporating the objective structures it produces in the second natures of habitus."[55] This early and, above all, implicit influence leads even to having the prevailing social order registered in the body by means of habituated schemes. In this regard, Bourdieu also speaks about an "implicit pedagogy" or a "somatiza-tion" of knowledge with far-reaching consequences.[56] Prevailing social power and dominance relationships are internalized through habituation and accepted as "natural" (naturalized) and thereby forgotten. He even sees the implicit dimension of knowledge of practitioners as being a result of this mechanism:

> It is because subjects do not, strictly speaking, know what they are doing that what they do has more meaning than they know. The habitus is the universalizing mediation, which causes an individual agent's practices, without either explicit reason or signifying intent, to be none the less "sensible" and "reasonable." That part of practices, which remains obscure in the eyes of their own producers, is the aspect by which they are objectively adjusted to other practices and to the structures of which the principle of their production is itself the product.[57]

For Bourdieu, the term habitus is indivisibly coupled with that of the social field. In collective interaction, they both outline the dimension of practice. The dialectic of habitus and social field is based on the assumption that behavior is always performed within a specific context and from a certain position.[58] Foremost, behavior has significance when interpretation of it includes the position of the actor in a socially well-differentiated field. This perspective on behavior is valid for science, as well as for politics, religion, and art.[59] Individuals are socialized into distinct fields and learn to behave appropriately according to the rules that apply there and the prevailing "symbolic capital."[60] Although social

54 cf. Pierre Bourdieu, *Distinction: A Social Critique of the Judgment of Taste* (Cambridge: Harvard University Press, 1984).
55 Bourdieu, *Outline of a Theory of Practice* (2010), 78.
56 Ibid., 94.
57 Ibid., 79.
58 Pierre Bourdieu, *The Logic of Practice* (Stanford: Stanford University Press, 1990).
59 cf. Pierre Bourdieu, *Homo Academicus* (London: Polity Press, 1990). Idem, *Rules of Art: Genesis and Structure of the Literary Field* (Stanford: Stanford University Press, 1996).
60 Bourdieu, *The Logic of Practice* (1990), 112–21.

fields provide actors with individual options for action, these actions are limited and apply to certain (often non-verbalized) constraints at the same time.

This observation can also be applied to the acquisition and transfer of connoisseurship and expertise in design. Design education, practice, and research are structured by means of certain implicit, practical, and social rules and self-conceptions and are transferred to a certain extent via tradition and authority. This complexity in the transfer process is even the case when the transfer does not take place perpetually but contingently, and it is renewed and changes with every generation. Often, precisely those components of the discourse of values that are bound to social tradition and authority remain implicit in design. For instance, the measuring of quality criteria in design or the gender-specific inclusion and exclusion processes in design education and practice reflect this implicitness. In this sense, Richard Sennett states in his book on craftsmanship that a large portion of authority possessed by master craftspeople stems from their knowing things that others don't and that this authority is presented non-verbally.[61]

Speaking Bans, Taboos, and Naturalizations

In regard to the spoken, the fact that "we can know more than we can tell" can be understood in such a way that tacit knowledge, rather than just presenting a "natural" circumstance, also includes the effects of social habituation, which always are manifested in it. Tacit knowledge can thus first be understood as a complex of certain incorporated cultural capital. It comprises practical and semantic knowledge, schemes, rules, and scripts, as well as values and standards, abilities, competencies, and skills.[62] If we transfer this interpretation of tacit knowledge to the field of design, we can assume that social and cultural determinants not only enable the explicit designation and provision of detailed information on a particular circumstance, activity, or knowledge, but also can impede or even prevent it. We do not mean to suggest that, theoretically, all knowledge and expertise can be verbalized, quantified, and formulated; rather, we do not see that a supposed "natural" epistemic structure of tacit knowledge in design is the only explanation why the knowledge of design practitioners remains "mute."

This interpretation indicates that the limits of what can be said by individuals is difficult to identify as such for two reasons: First, certain social orders are "incorporated" through habituation, and second, the regulation mechanisms of a discourse are usually unspoken and, as such, are performed and perpetuated without being detected. Michel Foucault, in repeatedly pointing out this mechanism, asserted that discourses are always cultivated by certain taboos and speaking bans. Such sanctions can be recognized by the fact that one does not have the right to say everything; that one can't speak about everything at every opportunity; and that, in

61   Richard Sennett, *Handwerk* (Berlin: Berlin Verlag, 2008), 109. English edition: *The Craftsman* (New Haven: Yale University Press, 2008).

62   Michael Meier, "Bourdieus Theorie der Praxis. Eine 'Theorie sozialer Praktiken'?," in *Doing Culture. Neue Positionen zum Verhältnis von Kultur und sozialer Praxis*, eds. Karl H. Hörning and Julia Reuter (Bielefeld: Transcript, 2004), 66.

the end, not just anybody can speak about anything.[63] This assessment can also be transferred to design for the purpose of critically questioning its intrinsic speaking bans and taboos.

In conclusion, a sensibility to the social dimension of knowledge seems essential for design researchers if we seek to avoid a positivistic reduction or a "romantic idealization" of tacit knowledge.[64] In regard to the implicit habituation and somatization of knowledge, it is appropriate to critically question the "often-declared as natural" apriorism of design. Design definitions based on such apriorisms, suggest, for example, that design is a "natural human ability" or an "essentially innate human capacity."[65] Such definitions marginalize the varied historical influences that decisively shape different design practices, and they conceal the cultural context and the social conventions that enable the acquisition of these practices in the first place. According to Roland Barthes, the myth about the "conditio humana" is based on an age-old mystification that has always involved counting on the fundamentals of the history of nature.[66] "Naturalization" consequently signifies that social, man-made meanings and orders are understood as originating from "nature," and such natural findings–as myths–shape history. Similarly, the habitus, Bourdieu writes, is "history turned into nature, i.e. denied as such."[67]

The currently targeted nexus of design practice and design research seems to indicate a vulnerability that would allow conveyed historical and socially standardized (self-)conceptions to flow into design research as "naturalized" findings and to be perpetuated there without being questioned. The debates on "tacit knowledge," in particular, are vulnerable to such naturalizations because the human body is addressed therein as an allegedly "natural" medium of knowledge. The danger is that knowledge will be understood unilaterally as biological phenomenon and that its significant socio-cultural dimension will be ignored. An insistence that we declare designerly practices in the context of research as "tacit," might then work against a transparently conducted knowledge discourse that avoids or rejects the critical analysis of natural and mythological figures in design discourses.

Concepts and models of a tacit knowledge are not free from "blind spots" themselves. They have been influenced by specific historical knowledge debates and social and economic contexts. Design researchers must consider such historical influences in the analysis of tacit knowledge and make the influences compatible with current knowledge debates.

63   Michel Foucault, *The Archaeology of Knowledge and the Discourse on Language* (New York: Pantheon, 1972), 215ff.

64   Neuweg, *Könnerschaft und implizites Wissen* (2004), 401.

65   cf. Filippo A. Salustri and Nathan L. Eng, "Design as…: Thinking of what Design might be," *Journal of Design Principles and Practices* vol. 1, no. 1 (2007): 24-25.

66   Roland Barthes, *Mythologies* (New York: Hill and Wang, 1972).

67   Bourdieu, *Outline of a Theory of Practice* (2010), 78.