

The (Non-)Knowledge of Practice

Praxeological Considerations on the Concerted Formation of Knowledge in Practices¹

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Contrary to the common assumption that knowledge is stored in the minds—or bodies—of individuals, it is understood in the following as something that unfolds *between* the human and non-human participants—things, objects, artefacts—of social practices. I focus in particular on the questions of how something new comes into being by collective practice and what role different kinds of knowledge play in this process.

Since I am not an expert in digital infrastructures, I can address only a limited number of the questions raised in the invitation to this volume. I therefore largely confine myself to examples from the world of sports to illustrate my theoretical considerations. In these examples, digital technologies do not yet play a major role; their role is merely the subject of a tentative outlook at the end of the article. Nevertheless, I briefly address the aspect of virtuality in the sense of opening spaces of potentiality and imagining alternatives, as this dimension bears relevance for the question that interests me here: the emergence of the ›new‹ in social practice.

By addressing the practical formation of knowledge in the concert of human and non-human contributions, I enter a field that has been investigated, among others, by cognitive science, philosophy, and science and technology studies (STS) under headlines such as ›distributed cognition‹,² ›situated action‹,³ ›situated knowledge‹,⁴ and agential realism.⁵ This field also includes contributions from the his-

1 I would like to thank Kristina Brümmer for her important comments.

2 Hutchins, Edwin (1995): *Cognition in the Wild*, Cambridge, MA: MIT Press.

3 Suchman, Lucy (2006): *Human-Machine Reconfigurations. Plans and Situated Actions*, 2nd, ed., Cambridge: Cambridge University Press. Online: <https://doi.org/10.1017/CBO9780511808418> (last access: 20.02.2026).

4 Haraway, Donna (1988): »Situated Knowledges. The Science Question in Feminism and the Privilege of Partial Perspective«, in: *Feminist Studies* 14:3, pp. 575–599. Online: <https://doi.org/10.2307/3178066> (last access: 20.02.2026).

5 Barad, Karen (2012): *Agentieller Realismus*, Berlin: Suhrkamp.

tory and sociology of science, such as Hans-Jörg Rheinberger's study *Experimental Systems and Epistemic Things* or Karin Knorr Cetina's work on the ›fabrication of scientific knowledge‹ in experimental physics.⁶ These studies emphasize that scientific knowledge is not simply discovered but fabricated in the course of social interactions and negotiations, with the active involvement of laboratories, devices, and theoretical assumptions—that is, material and cognitive artefacts—which, once mobilized as participants in practice, acquire a relative objectivity⁷ and agency of their own.

Furthermore, power struggles and disputes over prestige, recognition, and funding, as well as prevailing ›styles of thought‹⁸ and the norms of scientific communities play a decisive role in determining what is recognized as ›valid‹ knowledge and what is, by contrast, devalued as non-knowledge. From the perspective proposed here, such distinctions are produced and stabilized through recurrent acts of attribution. Following Lammi,⁹ I refer to these acts as ›situated doings and sayings that mark entities (in this case, forms of knowledge, TA) [...] in relation to a concern‹ (for example, the secure handling of data in the context of research projects). This perspective also applies, among other things, to philosophical debates concerning whether there is only propositional knowledge or whether, for instance, the practical capacity to dodge a ball or to ride a bicycle may also be considered a form of knowledge in its own right.

Both the title of this paper and these preliminary remarks should make clear that I adopt a practice-theoretical perspective on the emergence, valorisation, and

6 Rheinberger, Hans Jörg (2001): *Experimentalsysteme und epistemische Dinge. Eine Geschichte der Proteinbiosynthese im Reagenzglas*, Göttingen: Wallstein; Knorr Cetina, Karin (1984): *Die Fabrikation von Erkenntnis. Zur Anthropologie der Naturwissenschaft*, Frankfurt a.M.: Suhrkamp.

7 I use ›objectivity‹ (›Gegenständlichkeit‹) in the sense of Leont'ev's activity theory; Leont'ev, Alekseï N. (1931/1981): *Problems of the Development of the Mind*, Moscow: Progress Publishers. Here it does not mean that an action is directed at or influenced by an object. Rather, human activity is always objective for Leont'ev insofar as it is directed at something in the world that lies outside the subject and is transformed by the activity. ›Analogous to phenomenological intentionality‹ (Schürmann, Volker (2022): ›Was ist eine kulturelle Praktik? Zur Materialität von Bedeutungsräumen‹, in: Tobias Kienlin/Richard Bußmann (eds.): *Sociality–Materiality–Practice. Sozialität–Materialität–Praxis*, Bonn: Habelt, pp. 71–90, here p. 77), objectivity orients individual doings and constitutes them as *meaningful* action by determining whether X (e.g. running after someone) or Y (e.g. running a race) is done. It is therefore nothing physical but ›the determinacy of action‹ (ibid.), its ›actual motive‹ (Leont'ev, Alekseï N. (1978): *Activity, Consciousness, and Personality*, Englewood Cliffs/London: Prentice-Hall, p. 122, cited in Schürmann: *Was ist eine kulturelle Praktik?*, p. 77).

8 Fleck, Ludwik (1935/1980): *Entstehung und Entwicklung einer wissenschaftlichen Tatsache. Einführung in die Lehre vom Denkstil und Denkkollektiv*, Frankfurt a.M.: Suhrkamp.

9 Lammi, I. (2025): *Making Security Large. Assigning-Acts and the Concept of Large Concerns*. Working Paper for the Practice Theory Gathering 2025.

role of different kinds of knowledge in and for social practice. This implies that I am not primarily interested in the fabrication of knowledge within specialized settings and practices of knowledge production such as laboratories, but rather in the emergence of knowledge—understood as what is situationally recognized as knowledge—across all kinds of practices. Knowledge, I argue, drawing on Louis Althusser's notion of a ›materialism of encounter‹,¹⁰ emerges from the contingent encounters of heterogeneous human and non-human ›co-players‹. At the same time, I attempt to show that such encounters, while not predetermined, are also not entirely arbitrary but subject to a variety of conditions and thus characterized by a form of conditioned contingency.

Against this background, I first sketch several basic features of my selective engagement with the vocabulary of recent practice theories and their conceptualizations of knowledge (I). By a second step, I elaborate the concerted formation of knowledge as a process of mutual enablement among people, bodies, and things in practice (II). Third, I turn to the problem of the emergence of the ›new‹ in collective socio-material and socio-imaginary constellations, which opens up spaces of imagination and meaning (III). Finally, I outline some tentative reflections on how, and with what transformative effects, digital data participate in the emergence of knowledge in practices (IV).

1. The Knowledge of Practices

The cluster of approaches commonly referred to as ›practice theories‹ has gained considerable inter- and transdisciplinary appeal over the past four decades. This cluster includes such diverse perspectives as Pierre Bourdieu's praxeology, Anthony Giddens's structuration theory, Harold Garfinkel's ethnomethodology, Theodore Schatzki's social ontology, Michel de Certeau's *Art of Practice*, and—often overlooked—Aleksēi Leont'ev's cultural-historical activity theory.¹¹ These approaches differ, among other things, by their ways of understanding practice, by the roles they attribute to human actors, and by whether they emphasize the reproduction or transformation of existing conditions. Nevertheless, a common orientation can be identified: practice theories oppose a mentalistic mode of thought that explains action either subjectivistically, by reference to hidden motives and intentions, or

10 Althusser, Louis (2010): *Materialismus der Begegnung. Späte Schriften*, Zürich: Diaphanes.

11 See, for example Schatzki, Theodore (2002): *The Site of the Social. A Philosophical Account of the Constitution of Social Life and Change*, University Park: Pennsylvania State University Press; Nicolini, Davide (2011): *Practice Theory, Work and Organization. An Introduction*, Oxford: Oxford University Press.

objectivistically, by invoking supra-subjective structures, rules, norms, and codes that operate behind the scenes.

Instead, praxeological inquiry is directed toward the phenomenal—and thus publicly accessible—richness of embodied, sensuous, and meaningful action within concrete material environments. Practice theories seek to render observable how social orders and their subjects are embodied, produced, maintained, and transformed through the interplay of humans, natural objects, and artefacts. While they do not deny the distinctive status of human actors, they relativize it: individuals no longer appear as autonomous centres of initiative but as specific participants among others, including infrastructures, buildings, tools, language, technologies, climatic conditions, and animals. From this perspective, things are not merely passive instruments of human action but appear as co-actors within the social. Accordingly, they are attributed a specific power¹² or agency¹³ that structures human behaviour, thinking, and action. As emphasized by Haraway and Actor-Network-Theory (ANT),¹⁴ such agency can combine with human agency to form hybrid agencies that transcend conventional boundaries between culture and nature, technology and biology.

Methodologically, two perspectives can be distinguished. From a performance perspective—what I refer to as *practice as performance*, following Shove et al. —the researcher attempts to understand how participants relate to one another in the flow of practice,¹⁵ what demands, expectations, and uncertainties they encounter, and what coping efforts they mobilize in the ›melee‹ of practice. When practices are instead observed *as entities*, attention shifts to the historically developed, typified, and recognizable structures and patterns of activity that prefigure practical performances and qualify individual actions as forms of playing along. Practices such as driving a car, teaching at school, or playing tennis can then be understood as settings within which bodily sayings and doings that are meaningless by themselves are regularly connected in ways that render them intelligible as contributions to a specific practice.¹⁶ Thus, hitting a ball with an appropriate object becomes intelligible as tennis only in the context of the practice of tennis, and a human body appears as a tennis-playing body whose movements can be evaluated by others as being elegant,

12 Akrich, Madeleine (1992): »The De-scription of Technical Objects«, in: Wiebe Bijker/John Law (eds.): *Shaping Technology/Building Society. Studies in Sociotechnical Change*, Cambridge, MA/London: MIT Press, pp. 205–224; Burri, Regula V. (2008): *Doing Images. Zur Praxis medizinischer Bilder*, Bielefeld: transcript.

13 Latour, Bruno (1988): »Mixing Humans and Non-humans together. The Sociology of a Door Closer«, in: *Social Problems* 35, pp. 298–310.

14 Haraway: *Situated Knowledges*.

15 Shove, Elizabeth/Pantzar, Mika/Watson, Matt (2012): *The Dynamics of Social Practice. Everyday Life and How It Changes*, London: Sage Publications.

16 Schatzki: *The Site of the Social*.

awkward, successful, or unsuccessful according to the explicit and implicit norms of the game. In this sense, a practice provides individual doings with a frame and an objectivity in the above-mentioned sense (see footnote 2): it organizes their context and attunes the perceptions, motivations, moods, and affects of human co-players to its internal structure of meaning, goals, and purposes. Schatzki refers to this as the *teleoaffective structure* of practice.¹⁷

To play along in a practice in an acceptable manner and to cope with the ›turmoil‹ of its performance, a range of capacities is required. Human co-players must, for instance, know which game they are currently engaged in and must possess a »practical sense« not only of the explicit rules but,¹⁸ above all, of the implicit conventions governing the respective game. In the practice-theoretical discourse, a variety of terms are used to refer to this sense, including tacit knowledge, skills, bodily techniques, routines, or *habitus*.¹⁹ While these terms foreground different aspects, they converge in designating an embodied form of practical knowledge that is not captured by the hegemonic concept of propositional knowledge in Western modernity and is therefore de-thematized as knowledge within that framework. From this perspective, one of the specific achievements of the various cultural-studies turns of recent decades—the spatial turn, performative turn, practice turn, material turn, postcolonial turn, and others—has been to bring into view not only *knowing that* but also *knowing how*: forms of knowledge anchored in materiality, corporeality, locality, and situatedness, and transmitted primarily through non-written means, from body to body, orally or even magically.²⁰

As Pierre Bourdieu has already emphasized, such practical knowledge enables for appropriate action even under conditions of uncertainty and time pressure that are characteristic of most everyday practices. However, if this knowledge is located primarily in the bodies of humans, there is a risk of reproducing a conception of knowledge and subjectivity familiar from both cognitive science and classical action

17 Ibid. p. 80–82.

18 Bourdieu, Pierre (1987): Sozialer Sinn. Kritik der theoretischen Vernunft, Frankfurt a. M.: Suhrkamp.

19 See Hirschauer, Stefan (2008): »Körper macht Wissen. Für eine Somatisierung des Wissensbegriffs«, in: Angelika Wetterer (ed.): Geschlechterwissen und soziale Praxis. Theoretische Zugänge – empirische Erträge, Königstein/Taunus: Ulrike Helmer Verlag, pp. 82–95.

20 From a Foucault-inspired, governmentality-theoretical perspective, however, the discourse on »body knowledge,« which is booming primarily in (body- and sports-) sociology and post-materialist anthropology, is also subject to considerable criticism because bodies that have been instituted as knowing could be easily subjected to new practices of governing, optimizing, and monitoring (cf. Koch, Anne (2016): »KörperWissen – Körpermacht. Wie die Formierung des Körpers als Wissen ihn neuen Praktiken des Regierens unterwirft«, in: Paragrana. Internationale Zeitschrift für Historische Anthropologie 25:1, pp. 61–75). See also Schmidt, Robert (2008): »Stumme Weitergabe. Zur Praxeologie sozialisatorischer Vermittlungsprozesse«, in: Zeitschrift für Soziologie der Erziehung und Sozialisation 28, pp. 24–41.

theory, with the sole difference that knowledge is no longer discovered in minds but in bodies. In this context, the role of material objects in the constitution of a situated capacity for action tends to be neglected. More recent practice-theoretical approaches, influenced in particular by debates in the sociology of technology (STS), therefore also emphasize the resource character of things and the effects on practice they generate. From this perspective, things appear as carriers of »warranties of use« (*Gebrauchsgewährleistungen*) or as infrastructures that can be relied upon for support,²¹ such as a handrail.²² In this sense, they encourage certain forms of behaviour while inhibiting others, much like »tightly cut garments«.²³ This view is extended to symbolic infrastructures,²⁴ such as language, as well as to digital technologies like the World Wide Web, which can then be understood, for instance, as scaffolds for human speaking, thinking, and remembering.²⁵

To describe the role of such entities in human action, practice-theoretical approaches often draw on the concept of *affordance*, originally developed in perceptual psychology.²⁶ However, if affordances are interpreted merely as »latent offers of action«,²⁷ the relational character of the concept is lost. As Gibson writes:

»[...] an affordance is neither an objective property nor a subjective property; or it is both, if you like. An affordance cuts across the dichotomy of subjective-objective and helps us to understand its inadequacy. It is equally a fact of the environment and a fact of behavior. [...] An affordance points both ways, to the environment and to the observer.«²⁸

Understood relationally, affordances make it possible to observe how people and things mutually inspire and *in-form* one another in practice—that is, how they notify

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- 21 Schmidt, Robert/Volbers, Jörg (2011): »Öffentlichkeit als methodologisches Prinzip. Zur Tragweite einer praxistheoretischen Grundannahme«, in: Zeitschrift für Soziologie 40:1, pp. 24–41, here p. 11.
 - 22 Hirschauer, Stefan (2016): »Verhalten, Handeln, Interagieren. Zu den mikrosoziologischen Grundlagen der Praxistheorie«, in: Hilmar Schäfer (ed.): Praxistheorie. Ein soziologisches Forschungsprogramm, Bielefeld: transcript, pp. 45–68, here p. 51. Online: <https://doi.org/10.1515/9783839424049-003> (last access: 19.02.2026).
 - 23 Ibid., p. 52.
 - 24 Ibid.
 - 25 Heersmink, Richard/Sutton, John (2020): »Cognition and the Web. Extended, Transactive, or Scaffolded?«, in: Erkenntnis 85:1, pp. 139–164, here p. 140. Online: <https://doi.org/10.1007/s10670-018-0022-8> (last access: 20.02.2026).
 - 26 Gibson, James (1979): The Ecological Approach to Visual Perception, Boston: Psychological Press.
 - 27 Jörissen, Benjamin (2015): »Bildung der Dinge. Design und Subjektivierung«, in: id./Torsten Meyer (eds): Subjekt Medium Bildung, Wiesbaden: Springer VS, pp. 215–233. Online: https://doi.org/10.1007/978-3-658-06171-5_11 (last access: 20.02.2026).
 - 28 Gibson: The Ecological Approach, p. 129.

and shape one another in such a way that neither remains unchanged.²⁹ From this perspective, things do not merely assume supportive functions or guarantee special uses; they also appear as media of thinking, designing, and imagining. The archaeologist Lambros Malafouris illustrates this in his ethnography of pottery-making,³⁰ aptly entitled »creative thinging«. His study shows that people do not simply think *about* things but think *with* and *through* them: by concrete engagement with materiality, potentials are explored and there emerge projects of what might be done with or out of things. Unlike a plan, a project is not a rationally conceived programme that can be implemented through technical action; rather, as Castoriadis explains,³¹ it is developed only under actual conditions and is shaped in practice until it eventually materializes by a realized object.

Malafouris's ethnography thus demonstrates that the materialities involved in a practice are not external to human thinking and acting but constitute an internal, quasi-organic moment of their formation. They are, so to speak, taken into thought (interiorised); they motivate and orient thinking and acting from within while at the same time acquiring concrete form and meaning for the actor only in practice. As noted above (see footnote 6), Leont'ev refers to this object-relatedness of practice as a constitutive feature of thinking and acting, describing it as their inescapable objectivity (*Gegenständlichkeit*). Such objectivity characterizes not only practices by way of which tangible objects are produced from raw materials, as in pottery, but also non-productive activities such as play or sport. Schürmann illustrates this point by the example of hurdle racing: from an activity-theoretical perspective,³² hurdles are not external environmental constraints that artificially hinder a subject's intention to cover a distance in the shortest possible time, as assumed in classical action theory. Rather, they define the intention and motivation themselves. Without hurdles, the intention and motivation to run hurdles would not arise in the first place; conversely, it is only through the athlete's practical engagement that the objects placed on the track become hurdles in the sporting sense.

29 Kalthoff, Herbert (2008): »Einleitung. Zur Dialektik von qualitativer Forschung und soziologischer Theoriebildung«, in: Id./Stefan Hirschauer/Gesa Lindemann (eds.): Theoretische Empirie. Zur Relevanz qualitativer Forschung, Frankfurt a.M.: Suhrkamp 2008, pp. 8–32, here p. 10.

30 Malafouris, Lambros (2014): »Creative thinking. The feeling of and for clay«, in: *Pragmatics & Cognition* 22:1, pp. 140–158.

31 Castoriadis, Cornelius (1990): *Gesellschaft als imaginäre Institution. Entwurf einer politischen Philosophie*, Frankfurt a.M.: Suhrkamp.

32 Schürmann, Volker (2014): »Bedeutungen im Vollzug. Zum spezifischen Gewicht der Praxisphilosophie«, in: *Sport und Gesellschaft* 11:3, pp. 218–231.

2. Reflective Enabling

To describe such co-constitutive relationships between human and non-human participants, my colleagues Nikolaus Buschmann, Kristina Brümmer, Matthias Michaeler, and I have developed the concept of *mutual enablement*.³³ By its threefold meaning—to *enable*, to *be enabled*, and to *be able to*—this concept emphasizes that enablement does not amount to the transfer of knowledge from one pole to another. Rather, it refers to processes in the course of which the entities participating in a practice mutually bring one another into play, engage one another, and attribute possibilities for action to one another.³⁴

This process is not a *creatio ex nihilo* but is marked by numerous preconditions. Co-players must already possess certain dispositions and must be disposed toward one another to be able to bring one another into play at all. We therefore distinguish conceptually between *disposition* and *ability*. Dispositions are diffuse, opaque, and indeterminate; they have the status of motor, cognitive, or affective potentialities which acquire the form of addressable competences only within the relational networks of practice. Being disposed toward one another does not necessarily mean that the dispositions of co-players must fit together seamlessly. Rather, it refers more modestly to the potential for establishing connections. Accordingly, the outcome of a coupling need not be smooth functioning; it may also take on the form of irritation or rupture, for example when a participant withdraws and decouples—out of listlessness, overload, shyness, or failure.³⁵

Enablement thus always has a flipside in the possibility of dis-enablement. An object may present itself as being resistant in each situation and elude use because its design, technology, or manageability finds no point of connection with an actor's dispositions. Or students may fail to gain access to the dispositifs of school teaching because the unfamiliar habitus of the social middle classes materializes by these dispositifs. These are examples of relations in which the embodied dispositions of certain groups are de-qualified and prevented from taking the form of recognized competence. They show that processes of recognition and de-recognition affect not only knowledge but also its carriers or media:³⁶ not everyone who potentially knows something can appear as a knowledgeable person. Individuals expe-

33 See for example Alkemeyer, Thomas/Buschmann, Nikolaus (2017): »Learning in and across Practices. Enablement as Subjectivation«, in: Allison Hui/Elizabeth Shove/Theodore Schatzki (eds.): *The Nexus of Practices. Connections, constellations, practitioners*, London: Routledge, pp. 8–23.

34 This is similar to what Kalthoff: *Einleitung*. means by mutual in-formation (see above).

35 Stäheli, Urs (2021): *Soziologie der Entnetzung*, Berlin: Suhrkamp.

36 I am using the vague term »medium« here in the sense of »mediator«. This is intended to emphasize that something—an object, a technology, a body—only becomes a medium of knowledge through social practice, that is, within the relationships of practice.

rience »epistemic injustice«³⁷ when material circumstances prevent their dispositional potentialities from entering the public sphere as knowledge.

From the perspective of a sociology of practices, mutual enablement is reflective in multiple ways. Co-players orient their activities toward one another, but they do so simultaneously with reference to the general understandings and teleoaffective structures that organize the practice currently being performed. When playing football, for instance, players observe and enable one another in different ways than when playing volleyball; when skateboarding in the public space, urban furniture is used in different ways than when shopping, and so on.

Affordances, through enactment of which participants inform and enable one another, therefore do not arise in a vacuum but within the meaningful context of the practice being performed. This also shapes the formation of practical knowledge. A key medium of such knowledge is the experience-based perception and sensing capacities of the body. By the performance of practice these capacities adjust to its teleoaffective structure, as do thinking and feeling. Through this adjustment, bodily doings and sayings are typically shaped in ways oriented toward the objectivity, the demands, expectations, goals, and norms of the respective practice. An action thus becomes recognizable as »playing volleyball«, »giving a lecture«, or »programming«.

Relevant artefacts—playing field, lectern, keyboard, screen, and so on—explicit knowledge (for example tactical knowledge of correct running and ball trajectories), and conscious reflection are always involved in this fundamentally bodily self-organization of action, as praxeographic studies of sports acrobatics or volleyball demonstrate.³⁸ Together, embodied sensory capacities, implicit practical knowledge, and explicit theoretical knowledge establish an *empractical co-knowledge* (*Mit-Wissen*, Leont'ev) oriented toward the respective activity in the form of multimodal reflection on one's own actions. This insight challenges the widespread assumption that reflection begins only when routine fails. Instead, reflection is always involved, with actors continuously shifting between routine and conscious reflection, pragmatic and meta-pragmatic registers.

37 Fricker, Miranda (2007): *Epistemic Injustice. Power and the Ethics of Knowing*, Oxford: Oxford University Press.

38 Brümmer, Kristina (2015): *Mitspielfähigkeit. Sportliches Training als formative Praxis*, Bielefeld: transcript; Michaeler, Matthias (2025): *Die Organisation von Zusammenarbeit als Frage der Praxistheorien. Zur konzertierten Ausgestaltung von Praxis am Beispiel des Volleyball-spielens*, Wiesbaden: Springer VS.

3. The Emergence of the New in Socio-Material and Socio-Imaginary Constellations

For a long time, practice-theoretical approaches were primarily concerned with how habits solidify by relations between bodies and things, thereby contributing to the reproduction of existing structures. More recently, praxeological interest has increasingly turned toward change and the emergence of novelty. Transformation is often explained in terms of shifts and re-constellations of materialities, competences, meanings, and practices that seem to arise from the continuous repetition of practice.³⁹ What is often overlooked, however, is what I call an imaginary power of transformation which manifests itself situationally by contingent encounters between human and non-human co-players.

This power can be illustrated by the ›invention‹ of the Fosbury Flop in high jump. At the 1968 Olympic Games in Mexico City the American high jumper Dick Fosbury was the first to clear the bar at a major international competition by using this technique.⁴⁰ Characterized by a fast arched approach, a turn of the torso during the final steps, and a backward clearance of the bar, the technique was initially regarded by experts as an idiosyncratic deviation. Renowned coaches such as the Soviet Yuriy Dyachkov were convinced it would have no lasting impact on the discipline. They were mistaken. By the late 1970s nearly all elite athletes had adopted this technique, which became the new standard.

The conditions for this ›revolution‹ were manifold. First, backward landings were made possible by the introduction of large foam safety mats, developed in response to serious accidents associated with new pole-vaulting materials. Second, Fosbury's social trajectory⁴¹ mattered: despite his height, he achieved only modest

39 Schäfer, Hilmar (2013): *Die Instabilität der Praxis. Reproduktion und Transformation des Sozialen in der Praxistheorie*, Weilerswist: Velbrück; Shove et al. *The Dynamics of Social Practice*; Schatzki, Theodore (2019): *Social change in a material world*, London/New York: Routledge.

40 In truth, Fosbury was not the first to use this technique. Back in 1958 the relatively unknown Austrian Fritz Pingl won the national championship by using this technique. Pingl's problem, however, was that despite his technique he only managed 1.96 m—not enough to compete with the big names. So it took a jumper who was able to win a major title by using the new style, such as Fosbury, to change this. Whether Fosbury copied the Austrian's jumping style or discovered the technique himself without knowing it already existed is unclear (see Heibel, Marco (2010): »Geh besser zum Zirkus«. *Der Fosbury-Flop im Hochsprung*«, in: *Netzathleten-Magazin*. Online: <https://www.netzathleten.de/lifestyle/sports-inside/geh-besser-zum-zirkus-der-fosbury-flop-im-hochsprung/> (last access: 20.02.2026)).

41 By this term Bourdieu refers to the connection between social structure and behaviour. The social conditions under which people grow up and perform their activities open up certain ›trajectories‹ in social space while closing off others. As soon as a person enters a social space, the trajectories of their possible careers are already prefigured and develop a certain force

success using the straddle technique and began to experiment. His training in physics enabled him to recognize that his new technique reduced the portion of the body passing over the bar at any given moment.⁴² Third, after years of being an outsider, Fosbury encountered a coach who believed in the technique and helped develop it systematically.

Fosbury's success immediately motivated imitation. In 1993, Javier Sotomayor cleared 2.45 m while using the flop, setting a world record that still stands. The diffusion of this technique was driven not only by performance gains but also by its symbolic appeal: Fosbury was perceived as being youthful, dynamic, and modern, resonating with the late-1960s zeitgeist of change: the media celebrated him as a »youthful pioneer [...] in encrusted structures«.⁴³

Translated into praxeological theoretical language, this means that Fosbury »inscribed« himself into the history of high jumping by »stubbornly« responding to the established routine of the discipline through experimentation with a new technique—a technique that was contingent upon infrastructural conditions, his personal trajectory, and the prevailing zeitgeist. More precisely, it was enabled by (a) his individual history of failure, (b) his marginal position within the field of high jumping—a position that, as Bourdieu shows for the literary field,⁴⁴ often favours an experimental disposition—(c) his *knowing how* acquired as a high jumper, for example in the form of a finely developed sense of distance and flight, and (d) his explicit theoretical knowledge (*knowing that*) acquired through his studies in physics outside the sporting context. Together, these conditions enabled Fosbury to grasp a historically emerging »situational potential« and to create and publicly perform a new technique.⁴⁵

At the same time this new technique remained anchored in the traditional practice of high jumping,⁴⁶ even though it was clearly distinct from it. The example thus illustrates the constitutive dependence of the invention of a new practice on

in interaction with other forces (cf. Staab, Philipp/Vogel, Berthold (2014): »Laufbahn (trajec-toire)«, in: Gerhard Fröhlich/Boike Rehbein (eds.): Bourdieu-Handbuch, Stuttgart: J.B. Metz-ler. Online: https://doi.org/10.1007/978-3-476-01379-8_34 (last access: 20.02.2026)).

42 Hartmann, Peter (2020): »Wendepunkte der Sportgeschichte«. Als Dick Fosbury den Hochsprung revolutionierte – und die Welt plötzlich auf dem Rücken lag«, in: Neue Zürcher Zeitung 14.04.2020. Online: <https://www.nzz.ch/sport/wendepunkte-der-sportgeschichte-a-ls-dick-fosbury-den-hochsprung-revolutionierte-und-die-welt-plotzlich-auf-dem-ruecken-lag-lid.1549753> (last access: 20.02.2026).

43 Ibid.

44 Bourdieu, Pierre (1999): Die Regeln der Kunst, Frankfurt a.M.: Suhrkamp.

45 Jullien, Francois (1999): Über die Wirksamkeit, Berlin: Merve.

46 Swidler, Ann (2001): »What anchors cultural practices?«, in: Theodore Schatzki/Karin Knorr Cetina/Eike von Savigny (eds.): The Practice Turn in Contemporary Theory, London: Psychology Press, pp. 83–101.

the dominant field-specific code—in this case, the outbidding code of competitive sport. The adoption of the new technique by other high jumpers, driven primarily by the prospect of enhanced performance but also by its relative ease of learning, qualified the new style as a significant innovation that permanently transformed the discipline of high jumping.

4. Tentative Considerations on the Participation of Digital Technologies in Social Practices

A practice-theoretical perspective shifts attention to the embedding of digital artefacts in the performance of social practices. This shift brings different dimensions of practice into view.

In a first dimension, attention is directed to how digital technologies are integrated into everyday routines, how they transform established practices—such as consumption, cooperative work, or sports—and which new practices of evaluation,⁴⁷ visualization, and comparison emerge through their participation.⁴⁸

A second dimension, which is of particular relevance for the purposes of this essay, focuses on interactions between humans and digital artefacts as well as on the forms of knowledge circulating within these interactions, drawing on Actor-Network-Theory (ANT) and Science and Technology Studies (STS). From this perspective, attention is paid, for example, to the role played by socio-technical arrangements composed of humans, interfaces, keyboards, mice, joysticks, data glasses, gaming chairs, and similar elements in organizing physical activities, actions, perceptions, affects, and (self-)experiences. At the same time this dimension raises the question of which kinds of knowledge must be developed and acquired to participate competently in such arrangements. Playing a computer game, for instance, requires practical knowledge appropriate to the use of the relevant artefacts as well as a practical sense of the specific objectivity (*Gegenständlichkeit*), spatiality, and temporality of the virtual game world represented on the screen. From this perspective, learning how to play a game means inhabiting its »microworld« »without a map«—as David Sudnow has shown it in his instructive phenomenological-praxeological contribution on game studies *avant la lettre*.⁴⁹ This involves becoming familiar with the mi-

47 E.g. Schatzki, Theodore (2025): »The Changing Form of Social Phenomena Today«, in: *Philosophy and Technology* 38:1, pp. 1–22.

48 E.g. Reckwitz, Andreas (2017): *Die Gesellschaft der Singularitäten. Zum Strukturwandel der Moderne*, Berlin: Suhrkamp, p.225–227; Beer, David (2016): *Metric Power*, London: Palgrave Macmillan; Schmidt, Robert/Kempf, David/Weigelin, Max (eds.) (2024): *Leistungsvergleiche und evaluative Praktiken. Sport als instruktiver Fall der Soziologie der Bewertung*, Bielefeld: transcript.

49 Sudnow, David (1983): *Pilgrim in the Microworld*, New York: Warner Books.

crowworld and adjusting concrete game activities, such as the minimal movements of an analogue joystick, to on-screen events through visual and auditory anticipation, timing, and a sense of rhythm, in such a way that movement and perception merge into a state of flow.

A precondition for this process is that the virtual game world maintains a reference to the analogue world and to skills acquired within it. Individual player characters in video football games, for example, can only be controlled appropriately by help of an analogue stick if practical knowledge incorporated through physical experience can be translated into the micro-movements required by the controller. From a phenomenological-praxeological perspective, the structure and practical logic of a virtual world thus becomes intelligible to actors in a manner analogous to that of the analogue world: by becoming accustomed to it in such a way that it turns into a medium for incorporated knowledge circulating between the socio-technical setting of concrete game activities and the events represented on the screen. Conversely, knowledge incorporated through virtual play can also feed back into analogue practice. In this sense, the virtual game functions as a training space for pre-reflective perceptual, decision-making, and affective knowledge which, once incorporated, also comes into play in analogue contexts. This enables, for example, for the recognition of situations that resemble the situational constellations of the game world, with the effect that situation-appropriate game knowledge is activated without conscious deliberation. The mimetic references between analogue and digital game worlds thus extend in both directions, in such a way that the screen does not constitute a boundary between digital and analogue worlds but rather functions as a »gate« through which practical knowledge circulates in continuous feedback loops.⁵⁰

The ways in which physical activities—such as playing a video game, participating in an online meeting, or programming—are formatted by socio-technical arrangements of digital practice are accessible to ethnographic observation and, in this sense, to the public.⁵¹ This also applies to the formatting of action through the design of software interfaces and online platforms. By contrast, the effects of algorithmic systems largely remain inaccessible to users and ethnographic observers *in situ*. These systems establish their own »grammaticality«,⁵² structuring action from offstage by filtering content, »deciding« what becomes visible and

50 Theweleit, Klaus (2004): *Tor zur Welt: Fußball als Realitätsmodell*, Köln: Kiepenheuer und Witsch.

51 Schmidt: *Stumme Weitergabe*; Schmidt/Volbers: *Öffentlichkeit als methodologisches Prinzip*; Schatzki: *The Changing Form of Social Phenomena Today*.

52 Fuhrmann, Jan (2024): *Die Zeit der Algorithmen. Zur Inklusion algorithmischer Systeme in die Zeitstrukturen des Ökonomischen und des Politischen*. Dissertation Carl von Ossietzky Universität Oldenburg.

what remains invisible, generating metrics that function as behavioural norms, or orienting attention and affect. In the case of autopoietic algorithmic systems such as artificial neural networks—which, unlike allopoietic systems, do not process communication based on predefined and pre-programmed universal rules but instead structure themselves through processes of ›learning‹—practice and algorithm mutually shape one another.⁵³ From this perspective, the algorithmic logic not only transforms established practices but also generates processes operating behind practices that guide it without being accessible to an actors' practical knowledge. Data logic operates behind users' backs, according to Martin Feige in his »Critique of Digitalization.«⁵⁴

This diagnosis also points out to a third dimension which addresses how digital practices structure and produce power relations, social hierarchies, and inequalities; how they (re)produce norms and evaluations; and how they ultimately affect the order of the analogue world by reshaping perceptions, attentions, activities, decisions, and affects, thereby contributing to new forms of subjectivity, such as the ›networked self‹.

From a praxeological perspective, however, digital artefacts do not determine practice. Rather, they acquire their meaning and value within practice itself. In this sense, they do not possess agency in and of themselves but are attributed agency through practice. Brümmer demonstrates this convincingly in her ethnographic studies on the use of digital game-analysis systems in professional football.⁵⁵ By generating new practices of visualization, measurement, and evaluation, these technologies help determine what may appear as a relevant fact for the concrete organization of training and match processes. They exert a profound influence on social interactions, team dynamics, and training and playing practices by reshaping how coaches and players perceive both the game and themselves. At the same time, which of the various forms of digitally generated information are recognized as relevant data for practical use remains subject to contested negotiation processes,

53 Ibid.

54 Feige, D. Martin (2025): *Kritik der Digitalisierung. Technik, Rationalität und Kunst*, Hamburg: Felix Meiner.

55 Brümmer, Kristina (2018): »Subjectivation by video. Ethnographic explorations on practices of video analysis in high-performance youth football«, in: *German Journal of Exercise and Sport Research* 48:3, pp. 358–365. Online: doi.org/10.1007/s12662-018-0504-5 (last access: 20.02.2026); Brümmer, Kristina (2019): *Spielsysteme, Matchpläne, Spielanalysen. Über Praktiken und Medien des Kontingenzmanagements im gegenwärtigen Fußball*. *Sport und Gesellschaft* 16:3, pp. 264–296. Online: <https://doi.org/10.1515/sug-2019-0017> (last access: 20.02.2026); Brümmer, Kristina (2019): »Coordination in Sports Teams. Ethnographic Insights into Practices of Video Analysis in Football«, in: *European Journal for Sport and Society* 16:1, pp. 27–43. Online: doi.org/10.1080/16138171.2019.1603682 (last access: 20.02.2026).

and the interpretation and evaluation of such data are equally contested. Experienced coaches have long insisted that digitally produced information is of limited relevance for organizing training and match processes when compared with their own practical experience and knowledge—their quasi-intuitive ›coaching eye‹. This assessment has been shaped, not least, by the fact that their position within the field depended on the recognition of this experience and knowledge and that its devaluation threatened their standing.

According to Brümmer, however, attitudes toward digital technologies have shifted in recent years. Digital data have increasingly gained recognition, partly because their quality has improved significantly in the eyes of relevant stakeholders. Contemporary digital analysis systems no longer merely record individual performance metrics—such as running distances, ball contacts, or shots on goal—which coaches and players often regard as offering limited insight into the players' ›ability to play along‹.⁵⁶ Instead, they also generate information on collective game dynamics, while practical insights derived from user experience are continuously incorporated into the technological development and the programming of analysis software.⁵⁷ This development enhances the value of digital data as a means of managing and constraining—rather than eliminating—the ignorance and uncertainty that are constitutive of competitive sports, for instance regarding player development and future success (or failure).

Nevertheless, even digitally generated information that is recognized as relevant data within the field does not exert any objective or direct influence. Rather, it becomes operative within meta-pragmatic negotiation practices in the course of which interpretations of and reflections on analogue training and playing practices are contested, for example between coaches and players. In other words, such data do not guide analogue practice directly but influence it indirectly through contested processes of interpretation and evaluation. Within these negotiation practices, data assume the status of ›boundary objects‹⁵⁸ to which all participants must refer from their respective positions to justify and legitimize their viewpoints. This way, they function as social factors which—despite lacking the materiality of a field marking or a goal—resemble them in one decisive respect: once established as recognized data, they cannot be ignored. All participants are compelled to engage with them to assert their positions, an engagement that in turn requires a practical sense of

56 Brümmer: Mitspielfähigkeit.

57 Schmidt, Robert/Kempf, David/Weigelin, Max (2024): ›Leistungsvergleiche und evaluative Praktiken. Sport als instruktiver Fall für eine Soziologie der Bewertung‹, in: id. (eds.): ›Leistungsvergleiche und evaluative Praktiken. Sport als instruktiver Fall der Soziologie der Bewertung, Bielefeld: transcript, pp. 13–42, here p. 30.

58 Star, Susan L./Griesemer, James R. (1989): ›Institutional Ecology, ›Translations‹ and Boundary Objects. Amateurs, Professionals in Berkeley's Museum of Vertebrate Zoology, 1907–39‹, in: Social Studies of Science 19:3, pp. 387–420.

the strategically effective, for example well-timed, use of data in practice. Contrary to technology-deterministic assumptions, digital artefacts thus do not determine practice in a linear, top-down manner; rather, they exert their influence indirectly by becoming shared reference points in social conflicts and negotiation processes. Their power is precisely due to this mediated, contested status.

5. Conclusion

To summarize, this contribution advances five core claims: First, knowledge is not a substance contained in individuals' minds and/or bodies nor in infrastructures or objects. Rather, it unfolds in practice through the contingent encounters of heterogeneous co-players. Secondly, an encounter is not merely a contact but a relational process that arises only if the entities involved are disposed toward one another. A lack of connectivity, by contrast, results in dis-enablement and exclusion. Thirdly, the abilities that become relevant as knowledge in an encounter are always reflectively tied to the teleoaffective structure and the guiding code of the practice currently being performed—for example, in sports to the code of outbidding, and in laboratory practice to the code of truth production. Fourthly, in encounters involving human and non-human participants, existing structures are not merely reproduced; they also open up »situational potentials« for the unfolding of a power of imagination from which novelty can emerge.⁵⁹ Finally, with the rise of new co-players in practice such as digital technologies, new forms of knowledge, self-knowledge, and non-knowledge are taking shape that not only transform practices and their subjects but also give rise to new practices and social contexts—for example, »synthetic situations«,⁶⁰ new modes of algorithmic formatting in practice, as well as debates on the evaluation and significance of digital data which themselves become established as powerful social factors in the context of these debates.

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59 Jullien: Über die Wirksamkeit.

60 Knorr Cetina, Karin (2009): »The Synthetic Situation. Interactionism for a Global World« in: *Symbolic Interaction* 32:1, pp. 61–87.

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