# Computer science first, social sciences second: A critical sociological account of Computational Social Science

Chung-hong Chan and Paul Balluff

GESIS

# Computer science first, social sciences second: A critical sociological account of Computational Social Science

Computational Social Science [1] has a *mood* of discipline, probably because how its name rings. But by looking at Computational Social Science in detail, it is not easy to classify it epistemically. In a discipline [2] such as political science, practitioners have a shared canon of knowledge and methodological tradition*s*. In a post-discipline like Communication (Waisbord, 2019), practitioners have neither shared canon of knowledge nor shared methodological traditions. Computational Social Science cannot be classified using these **disciplin** **nouns**. The best one can do is to classify Computational Social Science as a *methodological preference*. [3] It can also be reflected in the widely cited definition of Computational Social Science by its founding parents (Lazer et al., 2020, p. 1060) [4]:

> the development and application of computational methods to complex, typically large-scale, human (sometimes simulated) behavioral data.

The practitioners of Computational Social Science have a unique mix: there is no shared canon of knowledge. [5] But they have **exactly one** shared methodological tradition of

[1] This term is used as a proper noun in this article, because it is not just *social science* attached with the adjective *computational*. See definition below.

[2] This is based on Foucault (1971)'s comment on the components of an academic discipline: (shared) "groups of objects, methods, their corpus of propositions considered to be true, the interplay of rules and definitions, of techniques and tools" (p. 10).

[3] Similarly, Törnberg and Uitermark (2021) classify it as *Weltanschauung*; Shugars (2024) as perspective or choice.

[4] Edelmann et al. (2020) provide a similar definition, although they emphasize the end goal is to gain theoretical knowledge.

[5] However, in the —arguable— "offshoots" of it such as Computational Communication Research, there seems to follow the logic of the respective *disciplines in terms of organized knowledge. See, e.g., Hilbert et al. (2019) and Zhu et al. (2025)

using computational methods. Despite this, Computational Social Science —like other *disciplines— has the social structural functions of a Bourdieusian Field: [6] It serves as a hierarchical, stratified, and competitive arena for actors to compete for economic, social, cultural, and symbolic capital (also among fields) (Ignatow & Robinson, 2017). The namesake journals, conferences, learned societies, university departments, short-term training camps, and degree programs serve as arbiters of capital in terms of academic power, resource, and prestige. These social structural functions have to be understood within the following parallel societal developments since the 2010s: (1) the datafication and algorithmization of societies (Mejias & Couldry, 2019); (2) the rise of surveillance capitalism (Zuboff, 2019), and (3) the perceived superiority of knowledge produced through analyzing ever larger datasets (boyd & Crawford, 2012). Flowery languages to describe the importance of Computational Social Science in our society, such as "greatly improved our understanding of important phenomena" (Lazer et al., 2020, p. 1060) or "a new era has started in the understanding of the structure and function of our society" (Conte et al., 2012, p. 327), are not uncommon.

Bourdieusian Field is porous (Ignatow & Robinson, 2017); Computational Social Science is more porous than many academic disciplines. Computational Social Science can be described with **disciplin** **adjectives**, with *multidisciplinary* (Lazer et al., 2020) and *interdisciplinary* (Edelmann et al., 2020; Hase et al., 2022) being the most common.

In a field with only one uniting force of methodological preference, the way (perhaps, the *only* way) to garner power in the competitive field is to master and apply the preferred methods. With the *disciplinary nature, the Computational Social Science field is more porous to one group of actors: computer scientists. In fact, computer scientists can be said to be the most dominant actors of the field. While all scholars can acquire the knowledge to produce, refine, and apply computational methods, computer scientists have the unique symbolic capital (respect and admiration from peers of other disciplines) to

---

[6] French: *champ*

claim expertise of computational methods due to their education and affiliation. Therefore, computer scientists are rewarded disproportionally more often than other scholars in the power struggle inside the competitive field of Computational Social Science. The following are correlational evidence: (1) An analysis of a curated list of computational social science research groups and departments found that persons with a PhD in computer science lead these groups more often than social scientists; and (2) Wang et al. (2022) found that the citation network of papers under the Computational Social Science umbrella centers around computer science papers.

The dominant position of computer scientists allows them to set field-specific logic on what should be privileged ("rules of the game" [7]), some of them can be said to be at odds with social sciences. [8] (1) The epistemological stance of Computational Social Science mirrors computer science's pragmatic instrumentalism (Benthall, 2016), i.e. computational methods and social science theories are mere tools to achieve certain goals; disregarding other stances of social sciences, e.g., critical realism, critical theory, interpretivism; (2) The goals are *thought to be* predictive (Hofman et al., 2017). The standard from computer science, such as the trade-off between precision and recall, can be directly imported to Computational Social Science to evaluate the utility of computational methods for social sciences. Not how well they can help us to accurately explain and understand the social world; (3) "Shared tasks" and "leaderboarding" are spilled over from computer science as an emergent social activity for developing and evaluating computational methods (Assenmacher et al., 2021), motivated by applications in Computational Social Science (e.g., Kiesel et al., 2022); (4) The most popular methodological topics in computer science are automatically the most popular methodological topics in Computational Social Science, e.g., large language models. Not vice versa.

---

[7] French: *croyance dans l'intérêt du jeu*

[8] due to the misrecognition of the peer social scientists to unknowingly participate in their own subjugation by internalizing these field-specific logic as normal, thereby reinforcing the power of computer scientists.

## References

Assenmacher, D., Weber, D., Preuss, M., Calero Valdez, A., Bradshaw, A., Ross, B., Cresci, S., Trautmann, H., Neumann, F., & Grimme, C. (2021). Benchmarking crisis in social media analytics: A solution for the data-sharing problem. *Social Science Computer Review*, *40*(6), 1496–1522. https://doi.org/10.1177/08944393211012268

Benthall, S. (2016). Philosophy of computational social science. *Cosmos and History: The Journal of Natural and Social Philosophy*, *12*(2), 13–30.

boyd, d., & Crawford, K. (2012). Critical questions for big data: Provocations for a cultural, technological, and scholarly phenomenon. *Information, Communication & Society*, *15*(5), 662–679. https://doi.org/10.1080/1369118x.2012.678878

Conte, R., Gilbert, N., Bonelli, G., Cioffi-Revilla, C., Deffuant, G., Kertesz, J., Loreto, V., Moat, S., Nadal, J. .-., Sanchez, A., Nowak, A., Flache, A., San Miguel, M., & Helbing, D. (2012). Manifesto of computational social science. *The European Physical Journal Special Topics*, *214*(1), 325–346. https://doi.org/10.1140/epjst/e2012-01697-8

Edelmann, A., Wolff, T., Montagne, D., & Bail, C. A. (2020). Computational social science and sociology. *Annual Review of Sociology*, *46*(1), 61–81. https://doi.org/10.1146/annurev-soc-121919-054621

Foucault, M. (1971). Orders of discourse. *Social Science Information*, *10*(2), 7–30. https://doi.org/10.1177/053901847101000201

Hase, V., Mahl, D., & Schäfer, M. S. (2022). Der „Computational Turn“: ein „interdisziplinärer Turn“? Ein systematischer Überblick zur Nutzung der automatisierten Inhaltsanalyse in der Journalismusforschung. *Medien & Kommunikationswissenschaft*, *70*(1–2), 60–78. https://doi.org/10.5771/1615-634x-2022-1-2-60

Hilbert, M., Barnett, G., Blumenstock, J., Contractor, N., Diesner, J., Frey, S., Gonzalez-Bailon, S., Lamberso, P., Pan, J., Peng, T.-Q., Shen, C., Smaldino, P. E.,

Van Atteveldt, W., Waldherr, A., Zhang, J., & Zhu, J. J. H. (2019). Computational communication science: A methodological catalyzer for a maturing discipline. *International Journal of Communication*. https://ijoc.org/index.php/ijoc/article/view/10675/2764

Hofman, J. M., Sharma, A., & Watts, D. J. (2017). Prediction and explanation in social systems. *Science*, *355*(6324), 486–488. https://doi.org/10.1126/science.aal3856

Ignatow, G., & Robinson, L. (2017). Pierre Bourdieu: Theorizing the digital. *Information, Communication & Society*, *20*(7), 950–966. https://doi.org/10.1080/1369118x.2017.1301519

Kiesel, J., Alshomary, M., Handke, N., Cai, X., Wachsmuth, H., & Stein, B. (2022). Identifying the human values behind arguments. *Proceedings of the 60th Annual Meeting of the Association for Computational Linguistics (Volume 1: Long Papers)*, 4459–4471.

Lazer, D. M. J., Pentland, A., Watts, D. J., Aral, S., Athey, S., Contractor, N., Freelon, D., Gonzalez-Bailon, S., King, G., Margetts, H., Nelson, A., Salganik, M. J., Strohmaier, M., Vespignani, A., & Wagner, C. (2020). Computational social science: Obstacles and opportunities. *Science*, *369*(6507), 1060–1062. https://doi.org/10.1126/science.aaz8170

Mejias, U. A., & Couldry, N. (2019). Datafication. *Internet Policy Review*, *8*(4). https://doi.org/10.14763/2019.4.1428

Shugars, S. (2024, July). A matter of perspective: Computational social science and researcher choice. In *Oxford handbook of engaged methodological pluralism in political science*. Oxford University Press. https://doi.org/10.1093/oxfordhb/9780192868282.013.46

Törnberg, P., & Uitermark, J. (2021). For a heterodox computational social science. *Big Data & Society*, *8*(2). https://doi.org/10.1177/20539517211047725

Waisbord, S. (2019). *Communication: A post-discipline*. John Wiley & Sons.

Wang, X., Song, Y., & Su, Y. (2022). Less fragmented but highly centralized: A bibliometric analysis of research in computational social science. *Social Science Computer Review*, *41*(3), 946–966. https://doi.org/10.1177/08944393211058112

Zhu, J. J., Peng, T.-Q., & Liang, H. (2025). Computational communication research (CCR): An early and active adopter of computational social science (CSS). *Chinese Journal of Sociology*, *11*(1), 5–30. https://doi.org/10.1177/2057150x251317548

Zuboff, S. (2019). Surveillance capitalism and the challenge of collective action. *New Labor Forum*, *28*(1), 10–29. https://doi.org/10.1177/1095796018819461