

## David Schmeidler (1939–2022): A Personal Memoriam

David Schmeidler passed away on the night of 17<sup>th</sup> March, and the author is grateful to be asked to pen a few lines, certainly not on his impact on decision and game theory, or even on mathematical economics more generally, but specifically on the Walrasian theory of general economic equilibrium. It is obviously too early to attempt an impersonal obituary of the *oeuvre* that is Schmeidler's bequest to economic theory, not to mention the author's obvious limitations for such a task. It will take time and extended study.

As one of Schmeidler's students makes clear, the master was not a talker.

He was a man of few words, even more then than nowadays. In a working paper he once used no more than five words to describe the whole Savage uncertainty model: "Acts map states to consequences."<sup>1</sup>

Not only taciturn, but also without sham or pose or self-advertisement or entrepreneurship, a man absorbed in the problem and the subject at hand, a subject that stands by itself, purified from all attachment to the psycho-sociological here and now.<sup>2</sup> Never one for theatricality and empty sentimentality, I too shall defer to his honoured memory by sticking to facts, and shall limit myself even further to a subset of his work within Walrasian economics itself – to his publications in the four-year period 1969-1973.

It is difficult for those not in my generation to appreciate the verve and dash with which David Schmeidler burst on the mathematical economics scene. I joined graduate school the year he finished his Ph.D, and my teachers<sup>3</sup> impressed on me to keep my eyes on his ascent; by the time I finished, he had published 13 papers, the first being his highly cited debut on the *nucleolus*. The average length of twelve of these papers is under six printed pages, and if one is to include the paper with Debreu, no loquacious talker himself, the number jumps to under seven. Two of the (*Econometrica*) publications are less than a page and a half: one is a full paper, and the other has no references! The economy of expression, and the catholicity of citations, is fully mirrored in the papers themselves: permitted space does not allow an elaboration of their many subtleties.

The co-authors are a veritable *Who's Who* in mathematical economics of the time, and rather than a simple listing, I only cite what one of them had to say.

I met David Schmeidler by correspondence in 1967. In a letter to Robert Aumann I asked for help on a mathematical problem which I could not solve. A few months later I received a letter from David containing the solution.<sup>4</sup>

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<sup>1</sup>Wakker (2020) recounts an episode: "“Just tell me the main axiom.” I directly wrote my truncation continuity axiom. David looked away for two minutes in silence, then said “OK I see,” and ended the meeting. And I knew that he had seen the whole thing. Again, he was a man of few words.”

<sup>2</sup>Billot-Gilboa (2020) use the adjectives “novel, original, iconoclastic, and almost rebellious.”

<sup>3</sup>Donald J. Brown, Tjalling C. Koopmans, Herbert E. Scarf and Ross M. Starr.

<sup>4</sup>The paper was Schmeidler's celebrated solution to Fatou's lemma in several dimensions; Hildenbrand (2005-GEB) gives the reference and continues “Since that time, we worked together on various topics of general equilibrium theory of large economies – a wonderful experience in my scientific career.”

Indeed, the *cognoscenti* are well-aware that one of his more important insights of this period was not published under his name: an alternative proof of Aumann's celebrated 1964 equivalence theorem appeared, with full acknowledgement, in Hildenbrand's 1972 Berkeley survey. And since I am sticking to objective counts, the number of entries in the name index of Hildenbrand's 1974 book is itself most revealing: next to Debreu and the author himself, Schmeidler ties with his teacher Aumann to outrank Scarf, Shapley, Arrow and Hahn. The papers of this 4-year period opened many doors, and though it may sound strange to say in 2022, their full impact has yet to be fully gauged.

Schmeidler himself encouraged this silence – none of the 1969-1973 papers figure in his 1980 fellowship submission to the Econometric Society. Where Debreu determined four directions for Walrasian theory, he determinedly laid out a fifth.<sup>5</sup> In any case, by 1974 he had moved on with his collaborations: to his first publication on *fairness* with Elisha Pazner in 1974, to *collective choice* with Ehud Kalai and Edi Karni in 1976, and to *decentralization* with Leo Hurwicz by 1978. I date his 1981 paper with Postlewaite as his last work on Walrasian economics – he never looked back on the subject again. His 2019 return, with Simone Cerreia-Vioglio and Fabio Maccheroni, to his 1973 pioneering paper on large games is in sharp contrast to this.

There are scholars who do not draw their identity from the discipline they eventually lead, but rather begin by defining their subject by their very style and signature.<sup>6</sup> In giving purpose to my intellectual life projected to the register of Walrasian theory, David Schmeidler belonged to this select few.<sup>7</sup> Along with so many others embodying the references below, I mourn the loss of his presence, both professional and personal.

Billot, A., Gilboa, I.: Introduction. *Revue Économique* **71**(2), 221-224 (2020)

Gilboa, I. (Ed.): *Uncertainty in Economic Theory: Essays in honor of David Schmeidler's 65th birthday*. Routledge, London (2004)

Karni, E., Postlewaite, A.: Preface. *Games and Economic Behavior* **50**(1) 1-2 (2005)

Sargent, T., Siniscalchi, M.: Editorial: Symposium Issue on Ambiguity, Robustness, and Model Uncertainty. *Journal of Economic Theory*. **190**(105404) (2022)

Wakker, P. P.: A personal tribute to David Schmeidler's influence. *Revue Économique* **71**(2), 387-390 (2020)

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<sup>5</sup>See the first paragraph of *Econometrica* **48**(7), (1980). Also Footnote 1 singling out a “result first introduced by the author in a Berkeley NBER talk, research for this short paper [being] carried out in (*sic*) Minneapolis, Urbana, Illinois and Tel-Aviv,” and followed up in two 1976 Working papers.

<sup>6</sup>He once joked to me that there are authors one does not need to read: reading their titles is enough to know the paper. His last email to me on June 10, 2020 said “Very good paper, except the title.”

<sup>7</sup>And it would surely be out of place to chart their influence on my own work starting from my three papers published in 1974, the first of which I knew him to be the referee.