11 June 1992

Mr. Peter Fishburn: (Letter #2)
AT&T Bell Laboratories
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Dear Peter:

I am now at my office and can address the four Fishburn-Wakker Questions.

1. I now have no memory of 1950 Nash as being in the "independence" act. I knew its bargaining aspect (and my pal Bob Bishop knew it better), and regarded some of its "invariance" axiom(s) as contrived rather than natural. But since I referred to Nash in 1952, my present memory may have lost something.

Nash was a loner and I know of no "influences" on him. Alas, today's J.N. is not a reliable witness of those days.

2. Dalkey certainly spoke orally at Rand on these matters c.1949, and possibly in memos. (You strike me as too indulgent on J.v.N. His "mass" and other discussions of the time do not suggest to me that he sensed what was non-optimal about his expositions, which were ill-devised to alert me to 1949 Machina-like alternatives. Dalkey may have sniffed where the trouble lay but he never explained to me the relation between 1950 Marschak and J.v.N.--neither in 1950+ or before.)

3. I think by 1950 Savage did have the "sure-thing" principle in mind. After some complaining by me, he soon saw where his 1948 vision had been imperfect. (Probably in 1948 he thought he was writing up a valid version of it. Even Homer can nod.)

By the way, in your early pages and bibliography you say nought of Ramsey⊛. Why? For an early hero, he stars. Also, Savage knew de Finetti well. Isn't he in the act?

[handwritten: Good question]

[handwritten: →not really for utility.]

I believe Savage had no particular familiarity with $\Sigma_1^n U_j(X_j)$ consumer demand theory. I wonder why you include it as a topic in your article, since your own discussion shows

[handwritten: I would agree.]

[handwritten: ⊛Not really direct stuff in his axioms which, much as in VNM, sort of does the equivalence thing. The most relevant matter seems to be in the page following his axioms. (Did I comment on this earlier?)]

Peter,
This was my initial reaction, though
for different reasons. You "convinced"
me otherwise by the technical
connections.

its lack of indecomposability. I advise excluding it in your revision. Write a separate piece if you must.

4.   My earlier letter of today shows that, long prior to Sono, Leontief, and 1947 Samuelson, there was a vast literature on

$$\text{Max}_{q_i} \; \sum_{1}^{n} U_j(q_j) \; \text{s.t.} \; \Sigma p_j q_j = M$$

Only in the post 1930 period did the literature deal with <u>revealed</u> testings. I append references to several of my papers that are as germane as those you did cite.

Sincerely,

Paul

Paul A. Samuelson

PAS/jmm

P.S. The Chernoff axiomatizations are only tangentially related to the rest of your topics, I believe. *(I would agree)*

Some Additional References

Houthakker, H.S. (1960) "Additive Preferences", _Econometrica_ 28(2), 244-57.

Samuelson, Paul A. (1965) "Using Full Duality to Show That Simultaneously Additive Direct and Indirect Utilities Implies Unitary Price Elasticity of Demand", _Econometrica_ 33(4), 781-96.

Samuelson, Paul A. (1972) "Unification Theorem for the Two Basic Dualities of Homothetic Demand Theory", _Proceedings of the National Academy of Sciences, U.S.A._, 69(9):2673-74.

Samuelson, Paul A. (1974) "Complementarity: An Essay on the 40th Anniversary of the Hicks-Allen Revolution in Demand Theory", _Journal of Economic Literature_ 12(4), 1255-89.