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Original Paper

Keynes Never Assumed at Any Time in His Life… That All Statements or Proposition Stand in Logical Relation to each other (Misak, 2020, p. 114)

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Abstract

In a review of C.Misak's2020 biography of F P Ramsey, a reviewer named F. E. Guerra-Pujol assumed that the material contained in Misak's book on Keynes, as regards Ramsey's claims about Keynes's Logical Theory of Probability, on pp. 112-121 and pp.264-273,was true.

The problem is that all of the material in Misak's book dealing with Keynes is wrong, as it is based on claims made by F. P. Ramsey that directly conflicted with Keynes's application of Boole's relational, propositional logic.

Keywords

relational, propositional logic, Boole, relevance-irrelevance, interval valued probability, non additive, inexact, imprecise probability

Misak's discussion is based on a myth. The myth involves a claim that an 18 year old teenage "boy genius' supposedly appeared at Cambridge University in 1921 and convinced Keynes in 1922 that his logical theory of probability was badly flawed in an article that appeared in the *Cambridge Magazine* of January, 1922.

1. Introduction

The paper will be organized in the following manner. Sections Two and Three show that Ramsey had simply made up his own private, personal version of Keynes's theory as presented by Keynes in his *A Treatise on Probability* (TP, 1921). Ramsey then attributed his severely flawed version to Keynes. Section Four will examine the many errors contained in the following part of Guerra-Pujol's review:

"If there is a common or overarching theme during these formative years in Ramsey's intellectual life (1920-1924), it is Ramsey's willingness to challenge the most powerful and original ideas of such great and legendary scholars and philosophers as J.M. Keynes, G.E. Moore, Bertrand Russell, and Ludwig Wittgenstein. In this post, I will limit myself to just one such momentous undergraduate episode–Ramsey's early critique of Keynes's objective or logical theory of probability.

To appreciate Ramsey's first foray into probability theory, I must first provide some relevant background. The great Keynes had published his Treatise on Probability in 1921, and in a review of Keynes's work, none other than Bertrand Russell had called Keynes's Treatise "the most important work on probability that has appeared for a very long time," adding that the "book as a whole is one which it is impossible to praise too highly." (See Russell, 1948, 1922, p. 152) Why was Keynes's work so highly praised? Because Keynes had developed a new way of looking at probability, one which allowed for the possibility of probabilistic truth. For Keynes, probability consisted of an objective or logical relation between evidence and hypothesis, or in the words of Misak (2020, p. 113, emphasis added), a relation "between any set of premises and a conclusion in virtue of which, if we know the first, we will be warranted in accepting the second with some particular degree of belief."

Ramsey, however, immediately identified two blind spots in Keynes's conception of probability (See Ramsey, 1922; see also Misak, 2020, pp. 114-115). One was Keynes's admission that not all probabilities are numerical or measurable, especially when the truth values of our underlying premises are in dispute. In that case, when we have no idea whether our premises are true or not, Keynes's approach does not allow us to measure the probabilities of our conclusions. For Ramsey, by contrast, all probabilities should be measurable. But the other (more deeper) problem with Keynes's theory was the "objective" nature of his view of probability–*the idea that all statements or propositions stand in logical relation to each other. Ramsey denied the existence of these logical relations altogether*. Far from being an "objective relation", the strength or weakness of the relationship between two propositions also depended on psychological factors: on one's personal experiences and subjective beliefs. In a word, probability was based on experience, not logic. (Sound familiar? If not, check out the quote by the great Oliver Wendell Holmes below) (Guerra-Pujol, 2020, italics added).

Contrary to both Misak and Guerra-Pujol, Keynes never assumed the "…idea that all statements or propositions stand in logical relation to each other." anywhere in his A Treatise on Probability or in anything written by Keynes in his lifetime. The idea that Keynes said this is based only on the assertions and claims made by Frank P. Ramsey, who never provided any textual support at any time in his life to support his claim in anything that he published that dealt with Keynes. Section 5 will

conclude the paper.

2. Method-The Logical Examination of Ramsey's Claims in 1922

Consider Ramsey's 1922 claims that he made about Keynes's logical theory of probability:

"First, he thinks that between any two non-self-contradictory propositions there holds a probability relation (Axiom I), for example between "My carpet is blue" and "Napoleon was a great general"; it is easily seen that it leads to contradictions to assign the probability 1/2 to such cases, and Mr. Keynes would conclude that the probability is not numerical. But it would seem that in such cases there is no probability; that, for a logical relation, other than a truth function, to hold between two propositions, there must be some connection between them. If this be so, there is no such probability as the probability that "my carpet is blue given only that "Napoleon was a great general", and there is therefore no question of assigning a numerical value." (Ramsey, 1922, p. 3).

Ramsey's entire quotation above directly conflicts with the logical structure of Keynes's Boolean framework, where specified an argument form that all of the propositions needed to satisfy:

"Let our premisses consist *of any set* of propositions h, and our conclusion consist *of any set* of propositions a, then*, if a knowledge of h justifies* a rational belief in a of degree α, (then-author's insert) we say that there is aprobability-relation of degree α between a and h."(Keynes, TP, 1921, p. 4; italics added).

Only if a knowledge of h justifies a can there be a "…probability-relation of degree α between a and h." Otherwise, there is NO SUCH LOGICAL RELATION between the a and h propositions. Ramsey's fanciful belief that there can be only one h proposition and one a proposition is nonsense.

Keynes gives an excellent example of his argument form on pp. 5-6: "These general ideas are not likely to provoke much criticism. In the ordinary course of thought and argument, we are constantly assuming *that knowledge of one statement*, while not proving the truth of a second, yields nevertheless *some ground* for believing it. We assert that we ought *on the evidence* to prefer such and such a belief. We claim rational grounds for assertions which are not

conclusively demonstrated. We allow, in fact, that statements may be unproved, *without, for that reason, being unfounded*. And it does not seem on reflection *that the information we convey* by these expressions is wholly subjective. When we argue that Darwin gives alid grounds for our accepting his theory of natural selection, we do

not simply mean that we are psychologically inclined to agree with him; it is certain that we also intend to convey our belief that we are acting rationally in regarding his theory as probable. *We believe that there is some real objective relation between Darwin's evidence and his conclusions, which is independent of the mere fact of our belief, and which is just as real and objective,* though of a different degree, s that which would exist if the argument were as demonstrative as syllogism. We are claiming, in fact, to cognise correctly a logical onnection between one set of propositions *which we call our*

evidence nd which we suppose ourselves to know, and another set which we all our conclusions, and to which we attach more or less weight a*ccording to the grounds supplied by the first. It is this type of objective relation between sets of propositions—the type which we claim to be correctly perceiving when we make such assertions as these—to which the reader's attention must be directed*." (Keynes, 1921, pp. 5-6; italics added).

Ramsey's example "…for example between 'My carpet is blue' and 'Napoleon was a great general'…" is utterly preposterous and completely ridiculous because knowledge of the color of a carpet can't supply any connection/association (or justification)between the two propositions, with one proposition being regarded as providing relevant information or evidence for another proposition, a conclusion.

Ramsey's entire paragraph represents a complete contradiction of, and is completely contradictory to, what Keynes presented very clearly on pp. 4-6 and later on pp. 54-56 of the TP with his relevance -irrelevance logic.

Finally, Keynes would not conclude that "…the probability is not numerical." (Ramsey, 1922, p. 3). Keynes would conclude that Ramsey's example violated his argument form and that, therefore, there is no conditional probability because neither of the propositions provides any relevant evidence for the other. It is extraordinary that so many philosophers and economists have described Ramsey's 1922 article as being brilliant when it is nonsense.

In his July, 1922 review of Keynes's book in the *Mathematical Gazette*, Russell, in a small footnote on p.120, showed how Ramsey's example was completely inconsistent with Keynes's relevance irrelevance logic. No philosopher or economist or any other academician has ever used Russell's example to challenge the soundness of Ramsey's claim in 100 years.

3. Method-The Logical examination of Ramsey's Claims in 1926

Consider the following:

"Mr. Keynes starts from the *supposition* that we make probable inferences for which we claim *objective validity*; we proceed from full belief in one proposition to partial belief in another, and we claim that this procedure is *objectively right*, so that if another man in *similar* circumstances entertained a different degree of belief, he would be *wrong in doing so*. Mr Keynes accounts for this by supposing that *between any two propositions*, taken as premiss and conclusion, there holds one and only one relation of a certain sort called probability relations; and that if, in any given case, the relation is that of degree α, from full belief in the premiss, we should, if we were rational, proceed to a belief of degree α in the conclusion." (Ramsey, Truth, & Probability, 1926; In Kyburg & Smokler, 1980, pp. 26-27; italics added).

All of the italics portions of Ramsey's paragraph above are false. First, Keynes is starting with a foundation based on Boole's propositional relational logic that has nothing to do with any "suppositions" on Keynes's part. Second, Keynes holds that the conclusions are rational, not "objectively valid". Third, the procedure is one that it is rational to entertain and is not "objectively

right". Fourth, it would have to be the same circumstances, not just "similar" circumstances. Fifth, the decision maker would be non rational, not "wrong". Sixth, Keynes is not supposing; Keynes is defining that his logic holds between SOME SETS of, and not "any two", propositions. The form of Ramsey's error was spotted by Bertrand Russell in his review of Keynes's book on p. 120. Russell showed that his counter example led to the refutation of Ramsey's entire critique, as it violated the relevance -irrelevance logic of Keynes provided in chapter Four of the TP. Russell's 1922 refutation also refutes Ramsey's 1926 claims.

Ramsey is simply repeating all over again his errors from his 1922 review. Keynes's approach (a) does not involve any propositions but only those propositions that are related and (b) can involve sets of propositions, so that it is not restricted to only two propositions. Keynes's account requires a specific argument form, as was discussed in section 2 above. Likewise, it is not restricted to only two propositions. The same results are obtained when considering Keynes's more detailed relevance -irrelevance logic in chapter 4 on pp.54-56.

The rest of Ramsey's quote is a garbled mess that we can better analyze technically with Keynes's two logical relations, P and V, where

$P(a/h)= \alpha, 0 \leq \alpha \leq 1$, where α is a rational degree of belief

and

$V(a/h) = w$, $0 \leq w \leq 1$, and w measures the degree of the completeness of the relevant evidence (Keynes, 1921, p. 313, p. 315) supporting the argument form of P(a/h).

Thus, for Keynes**,** belief depends on both P and V, not P alone, as argued by Ramsey.

Ramsey, however, is correct in one very special case -the case where w=1, so that all of the α values are numerical. It does not hold in the general case where $w<1$, where the α values are interval valued probabilities or one is dealing with Keynes's decision weight approach from chapter 26.A decision maker can accept, and have a different opinion about, any value within the boundary set up by the upper and lower probabilities. A $w<1$ creates complex and intricate problems about one's beliefs because of the non linearities introduced by w in Keynes's decision theory which is a function of both α(probability) and w(weight) or P and V. This can best be seen by using the *Mathematica* program or *MathLab* to generate three dimensional contours of Keynes's conventional coefficient of risk and weight, c, involvingc, p and w. Everything is substantially simplified if w=1.

Similarly, Keynes's Principle of Indifference (POI) approach will generate, when applicable, only one answer. All **rational** decision makers will agree on what this one answer is. A good example is Ellsberg's first urn ball problem involving a choice between two urns to bet from, an urn with fifty red and fifty black balls versus an urn with a total of 100 red and black balls. The POI answer for both urns is 1/2. Thus, there will be "…one and only one…" answer.

Ramsey does not have any idea about V. Hence, he has no inkling about the role that confidence plays in belief. There is no simple, direct, linear connection between probability and belief for Keynes as there is for Ramsey. The one exception is if w=1, so that V drops out and one is left with α only.

Let us now consider Ramsey's example from 1926. It is as worthless as the example originally given by Ramsey *in Cambridge Magazine in 1922:*

"Besides this view is really rather paradoxical; for any believer in induction must admit that between This is red as conclusion and "This is round", together with a billion propositions of the form " is round and red" evidence, there is a finite probability relation; and it is hard to suppose that as we accumulate instances there is suddenly a point, say after 233 instances, at which the probability becomes finite and so comparable with some numerical relations." Ramsey, 1926, p. 28; in Kyburg & Smokler (Eds.), 1980).

This example directly violates the argument form put forth by Keynes on pp. 4-6 of the TP, since there is no connection between "This is red" and" This is round", so that neither proposition provides any information or evidence with regards to the other. There is no conditional probability specification for (this is red/given that that is round). Again, given the fact that the example has nothing whatsoever to do with anything that is in Keynes's book, my only conclusion is that Ramsey must be on some type of medication, drug, or narcotic or that he is, like Wittgenstein, a genius who also suffered temporary bouts of insanity. Note also Ramsey's attempt to introduce a joint probability into his argument that has nothing to do with Keynes's theory, which is based on conditional probability only.

4. Result-Correcting the Errors in Guerra-Pujol (2020)

Guerra-Pujol (GP) gives a tiny fragment of Keynes's presentation of his argument form on pp. 4-6, that, if carefully studied, should have had GP asking questions about Ramsey's claim:

"…between any set of premises and a conclusion in virtue of which, if we know the first, we will be warranted in(sic) in accepting the second with some particular degree of belief." (GP, 2020)

"Between any set of premises" contradicts Keynes's position that such a relation holds between some set, not any set.

However, now GP accepts Ramsey's own private definition that has absolutely nothing to do with Keynes's definition and discussion on pp. 4-6:

"But the other (more deeper) problem with Keynes's theory was the "objective" nature of his view of probability–*the idea that all statements or propositions stand in logical relation to each other*. Ramsey denied the existence of these logical relations altogether." (GP, 2020).

Note that what Ramsey is denying is the existence of Keynes's relational, propositional logic that was built on Boole's relational, propositonal logic as contained in his *The Laws of Thought* (1854). All economists, such as B. Bateman (1987, 1990), J Runde (1994) and R. Skidelsky (1992, 2010), who agree with Ramsey (1922, 1989) appear to have absolutely no idea at all that Keynes's relational, propositional approach builds on Boole. What Ramsey is really saying then, although he himself was ignorant about the crucial role of Boole in constructing such a relational, propositional logic, is that Boole's relational, propositional logic involves severe error. Contributions that call this type of wild and wooly conclusion into question were made by Edgeworth (1884,1905,1922a,1922b), Wilson

(1934), Hailperin (1965, 1976, 1986, 1996), Russell (1922), Brady (2004a,b, 2014, 2016), Brady and Arthmar (2012), and Arthmar and Brady (2016,2017).

It is simply false that Keynes had "…the idea that all statements or propositions stand in logical relation to each other."

Contrary to Ramsey (1922, 1926), Braithwaite (1973), Misak (2020a,b, 2016), and GP (2020), only statements that are related to each other by relevant evidence can stand in logical relation to each other.

The second error of GP is his belief that

"Keynes's admission that not all probabilities are numerical or measurable, especially when the truth values of our underlying premises are in dispute. In that case, when we have no idea whether our premises are true or not, Keynes's approach does not allow us to measure the probabilities of our conclusions. For Ramsey, by contrast, all probabilities should be measurable." (GP, 2020)

fails to grasp Keynes's V relation, the evidential weight of the argument, where precise, exact measurement by a single number requires that V(a/h)=w, where w=1 would hold. If w<1, then imprecise, inexact, approximate measurement using intervals must be used. Ramsey's assertion that all probabilities are measurable by a precise, numerical, additive probability was rejected out of hand by Keynes in his TP because it prevents a decision maker from dealing with uncertainty, which Keynes defined as situations of partial knowledge and partial ignorance. Ramsey's version of subjective probability allows no role for uncertainty and can only deal with risk. Misak (2016, 2020a, b), Ramsey (1922, 1926, 1989; see Kyburg & Smokler, 1980), and Braithwaite (1973) were all simply ignorant of the concept of interval valued probability. Of course, this issue shows up again in the Keynes-Tinbergen debate of 1938-1940, where Tinbergen insists on using precise, exact, numerical, physics-type approaches, based on assuming the existence of normal probability distributions in macroeconomics, while Keynes insists that, in general, only approximate methods of calculation are possible.

5. Discussion

First, Keynes never developed a new way of looking at probability, one which allowed for the possibility of probabilistic truth. There is no such thing as probabilistic truth as regards the probability α. It is an oxymoron. What is rational or reasonable is not necessarily true.

Second, where Ramsey came up with his fanciful and fictional understanding of Keynes's logical theory of probability is unclear to me. Nowhere in Keynes's *A Treatise on Probability* is there any support for any claim made by F. Ramsey in either of his reviews in 1922 or 1926.There is no axiom I in Keynes's book that restricts the application of his logic to only two propositions, one a proposition and one h proposition. Nowhere is it stated by Keynes that there is a relation between any two non-contradictory propositions. Ramsey never supplies any page citation to where in Keynes's book this supposed axiom is stated. Apparently, academicians for over 100 years have simply assumed hat Ramsey had to have been right because he was agenius. He was a genius in some fields. However,

those fields did not encompass probability, statistics and decision theory, where B. Russell correctly concluded that in those fields Ramsey's work had the least value with respect to all of his other contributions.

Third, Ramsey's erroneous claims have been repeated by R.B. Braithwaite. His erroneous assessment was placed at the front of the Collected Writings of John Maynard Keynes (CWJMK) 1973 edition in volume 8 as an editorial foreword by Donald Moggridge, the editor of the CWJMK. Moggridge made a huge intellectual blunder in allowing a rabid Ramsey partisan to regurgitate all of the many errors made by Ramey in his reviews of 1922 and 1926 about Keynes's theory. This version of the *A Treatise on Probability* has replaced the original 1921 version and has became the standard version taught to beginning students, especially in the economics and philosophy departments at Cambridge University, England.

Braithwaite's editorial foreword, which consisted of nine pages that simply repeat Ramsey's erroneous claims about Keynes's logical theory of probability, has served to infect everyone who read it with what I will call the Ramsey virus. The result is that students accepted the Ramsey myth about Keynes's book even before they had gotten past page 1 to pp. 4-6 of chapter Two of Keynes's A Treatise on Probability, where Keynes's actual discussion of the argument form, that was the foundation of Keynes's propositional logic, was presented. A careful reading of pp. 4-6, or pp. 54-56, would have shown the errors that Braithwaite was spreading. Unfortunately, no academician was able to understand that Keynes' s analysis in chapters one and two completely refute Braithwaite's claims.

We must conclude that Ramsey had no idea about what he was talking about as regards Keynes's theory of logical probability as contained in Keynes'*s A Treatise on Probability.* The same conclusion holds with respect to all academicians, especially economists, historians and philosophers (see Bateman (1987, 1989, 1990, 2016, 2021a, b), Clarke, 2005), Gillies (2000, 2003), Monk (1991), Mellor (1995), Weatherson (2002), Hacking (2014), Runde (1994), Skidelsky (1992, 2010), Suppes (2006) and Zabell (1991, 2005) for a few examples),who have been citing Ramsey's 1922 and 1926 reviews of Keynes's book as proof that there were severe problems with Keynes's deployment of his version of Boole's relational propositional logic that lead Keynes to reject the foundation of his logical theory of probability. Nothing could be further from the truth.

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