How Academicians Fell for Ramsey's Canard that Keynes did not Give a Definition of Probability

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Abstract	Review Article

It was F P Ramsey who first claimed that Keynes had stated that probability was indefinable in his 1922 review of Keynes's *A Treatise on Probability* in the January issue of *Cambridge Magazine*: "Mr Keynes takes probabilities or probability relations as indefinable, and says that if q has to p the probability relation of degree a, then knowledge of p justifies rational belief of degree a." (Ramsey,1922, p.3). Ramsey made an intellectual mess that made it impossible for a reader to understand what Keynes's formal relational, propositional logic was. This mess can be fixed to some degree by rewriting it in the following manner-Mr. Keynes takes probability as being indefinable if a single definition is required to be given. Let p and q be related propositions, where p contains the premise(s) and q is a conclusion(s) of an argument form based on p. Then knowledge of p justifies a rational degree of partial belief of a in q.

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Consider what Keynes Actually Said in the *A Treatise on Probability*:

"A definition of probability is not possible, unless it contents us to define degrees of the probability-relation by reference to degrees of rational belief. We cannot analyse the probability-relation in terms of simpler ideas. As soon as we have passed from the logic of implication and the categories of truth and falsehood to the logic of probability and the categories of knowledge, ignorance, and rational belief, we are paying attention to a new logical relation in which, although it is logical, we were not previously interested, and which cannot be explained or defined in terms of our previous notions." (Keynes, 1921, p.11; boldface added) Keynes has made a small slip here. Keynes's claim, that

"…**we are paying attention to a new logical relation** in which, although it is logical, we were not previously interested, and which cannot be explained or defined in terms of our previous notions." (Keynes,1921, p.11; boldface added), is misleading because Boole had already carefully discussed probability as being based on an objective, logical relation holding between related propositions in his *The Laws of Thought* in 1854 in chapters I and XVI.

O'Donnell gives an incomplete quotation by leaving out of his quotation that part of the quote where Keynes gives his definition:

"...A definition of probability is not possible, unless it contents us to define degrees of the probability-relation by reference to degrees of rational belief." (O'Donnell, 1989, p.37).

All other writers (for instance, Bateman, Carabelli, Davis, Runde, Winslow) on Keynes's *A Treatise on Probability*, like O'Donnell, have basically just repeated Ramsey's false claim.

Note that Keynes never, ever stated that no definition of probability was possible. Keynes said that **a** definition is not possible, by which he meant that there is not just one definition of probability that can be specified. Keynes thus agrees with Rudolf Carnap that there are at least two definitions of probability, three if we count K. Popper's 1958 propensity view as being distinct from the concept of probability as relative frequency.

Keynes gives his definition as "…to define degrees of the probability-relation by reference to degrees of rational belief." This is specified as $P(a/h) = \alpha$,

where $0 \leq \alpha \leq 1$, α is a rational degree of partial belief, and P stands for the logical relation of Probability as defined by Keynes in chapter X on p.119 of his *A Treatise on Probability*. Thus, Keynes's P(a/h) is equivalent to Carnap's c (h/e) definition of degree of confirmation for probability $_1$, once we correct for Carnap's misunderstandings concerning the role of intuition for Keynes in probability and the issue of the definability of probability.

SECTION 1: INTRODUCTION

The paper will be organized in the following fashion. Section Two will cover Ramsey's failure to correctly specify what Keynes's argument form was as constructed by Keynes in his A Treatise on Probability. Section Three will examine Carnap's misunderstandings. This section is based on my paper, titled "Keynes's intuition of objective, logical probability relations follows from Boole, not Plato or Moore: Boole's concept of intuition is based on "reflection" (Boole,1854, p.4) and" apprehension" (Boole,1854, p.4)." Section Four will conclude the paper.

Section 2: Ramsey's Intellectual Mess of 1922 in Cambridge Magazine

Consider Ramsey's first paragraph, in which Ramsey claims that Keynes stated that no definition of probability was possible: "Mr Keynes takes probabilities or probability relations as indefinable, and says that if q has to p the probability relation of degree a, then knowledge of p justifies rational belief of degree a." (Ramsey,1922, p.3).

Ramsey never ever correctly defines what p and q are. p and q must be defined as related propositions in an argument form. Ramsey, then, is presenting Keynes's discussions on page 11 of the TP in a very cavalier fashion.

A few lines down, Ramsey presents an example of what he claims Keynes's p and q propositions represent. Ramsey presents the p and q propositions as being unrelated, so that there is no logical connection or association between the p and q propositions: "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 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,1921, p.3).

Ramsey is able to foist this nonsensical example on the reader because he first creates a fake Axiom I that never existed anywhere except in Ramsey's imagination as a hallucination: "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'." (Ramsey,1921, p.3).

Ramsey's entire 1922 review is simply nonsense. A knowledge that the p and q propositions must be related would have made Ramsey's example involving unrelated propositions a non sequitur that any reader of Keynes's TP would have been able to catch.

Section 3: Carnap's Errors on Keynes Concerning the Definition of Probability and the Nature and Role of Intuition

Unfortunately, Keynes's Boolean logic approach in the *A Treatise on Probability* is simply not known/understood in the Liberal Arts, Social Sciences and Behavioral Sciences, especially by economists and philosophers. Consider the following analysis by Carnap:

"Since Koopman's axioms hold in the present system of comparative confirmation, the theorems which he derives from the axioms hold likewise. However, with respect to the nature and function of the theory, there are some differences between the conception presented here and that of Koopman. He believes that the theory can only supply conditional statements concerning the comparative concept of confirmation; direct comparative statements of the form 'h is confirmed by e at least as strongly as h' by e'are not supplied by his theory. Statements of this kind cannot, in his opinion, be obtained with the help of any general principle, be it a principle of probability, of logic, or of experimental science; they can be obtained only by intuition. The results of this special kind of intuition seem to be regarded as not subject to rational examination (except for questions of consistency) and therefore not capable of rational reconstruction.

This view is similar to, and probably influenced by, Keynes's conception of probability as undefinable and based on intuition." (Carnap,1952[1962], p.45; boldface and underline added).

The erroneous nature of Carnap's misinterpretation of what Keynes means by the use of the word "intuition" will be covered in the body of the paper. Suffice it to say that this error appears to have been accepted by all philosophers and economists. Consider Kyburg:

"In 1921, and certainly in 1907, when the first draft of the Treatise was completed…, it was widely thought that the basic principles of logic had to be accepted on the basis of "intuition" …Many people

thought that the "first principles "of logic had to be accepted on intuitive grounds…Keynes distinguishes three senses of the term "probability". In the most basic sense, it refers to "the logical relation between two sets of propositions." (TP, p.11). Derivatively, the word applies to "the degrees of rational belief arising out of knowledge of secondary propositions which assert the existence of probability relations" (TP, p.12). And then one can apply the term" probable "to the proposition that is so believed." (Kyburg, 2010,pp.23-24).

Of course, this is actually a good summary of Boole's relational, propositional logic, as applied by Keynes in chapters I and II of his *A Treatise on Probability* (TP,1921). However, it is clear that Kyburg has no idea whatsoever that this approach was developed by Boole, not Keynes. What Keynes is doing in chapters I and II of the TP is providing a summary/application of what Boole had already done originally in 1854 in his chapters I, XI and XII of The Laws of Thought. It is just Keynes's argument form, (a/h), of related premises and conclusions.

Using Keynes's notation from page 119 of chapter XI from Part II of the TP, we have, where P is defined as the logical, objective, probability relation by Keynes,

$P(a/h) = \alpha$, where $0 \leq \alpha \leq 1$ and α is the degree of rational, partial belief in the conclusion, a.
α is a precise number if $V(a/h) = w = 1$, given $0 \leq w \leq 1$ and α is an imprecise number(interval) if $V(a/h) = w < 1$, where
V is the logical, objective, weight relation.

Consider the following statement by Keynes:
"A definition of probability is not possible, unless it contents us to define degrees of the probability-relation by reference to degrees of rational belief. We cannot analyze the probability-relation in terms of simpler ideas." (Keynes,1921p.11; boldface/underline added).

Keynes's statement, that" A definition of probability is not possible" (boldface and underline added), means that there is no possibility of coming up with a single definition of probability, which is, of course, identical to Carnap's correct conclusion that there must be two distinct definitions of probability. At no time in his life did Keynes state that no definition of probability is possible. He stated that a(single) definition of probability is not possible,

Keynes gives his definition of probability as "…define degrees of the probability-relation by reference to degrees of rational belief."

It is very clear what he said. He uses the word "define". I find it amazing that there is no philosopher, economist or social scientist in the 20th or 21st century

who simply read what Keynes actually said, not what Ramsey claims he said.

Carnap overlooks this in his discussion of Keynes's statement on p.11 that we cover below.
Keynes's definition is equivalent to Carnap's definition of probability₁, degree of confirmation.
Carnap's c (h, e) is Keynes's P(a/h).
Carnap also is misled by misinterpreting Keynes's comments on intuition:

"That the objective logical concept meant by Keynes is the same as what we call probability₁, i.e., the logical concept of confirmation, becomes quite clear both by numerous preliminary explanations and by his reason- ings in the construction of his system. He says, for instance:" ... a logical connection between one set of propositions which we call our evidence and which we suppose ourselves to know, and another set which we call our conclusions, and to which we attach more or less weight according to the grounds supplied by the first" (p. 5 f.). Keynes takes the concept in general as nonquantitative, similar to our comparative concept of confirmation; only in special cases does his theory allow the attribution of numerical values like our quantitative concept of degree of confirmation.

It is true, some statements of Keynes concerning his concept of probability are not in agreement with our conception of probability₁'. He says, for example: "A definition of probability is not possible .... We cannot analyze the probability-relation in terms of simpler ideas" (p. 8); later he speaks of "a faculty of direct recognition of many relations of probability" (p. 53) by a kind of "logical intuition" (p. 52). But I do not think that this is evidence against our interpretation of his concept in the sense of our probability₁." (Carnap,1952[1962], pp. 44-45)

What is missing from Carnap's exposition is an understanding that Keynes is basing the TP on Boole's relational, propositional logic.

Let us now consider more deeply how Carnap's misevaluation of Keynes's use of the word "intuition" leads to a misunderstanding of Keynes's Boolean system. The fundamental problem is that Carnap overlooked the Boole -Keynes connection.

Specifically, Carnap does not realize that Keynes's argument form (a/h) in chapter I of the TP comes directly from Boole.

Keynes's use of the word "intuition" is applied in the same way as Boole defines his use of the word "intuition." Keynes is not using the word "Intuition" to imply an ability to intuit a metaphysical, Platonic entity which is floating around "out there" somewhere in the universe a la G E Moore.

Carnap has thus been misled about what Keynes means by intuition. It is identical to what Boole meant by intuition.

SECTION 4: CONCLUSION

The universal reliance by all academicians for over 100 years on Ramsey's two reviews of 1922 and 1926, plus his 1923 Apostles presentation of "Induction: Keynes and Wittgenstein", account for the very severe errors made by all orthodox and heterodox economists, philosophers and social scientists in what is called by Misak as "Keynes studies" by so called, alleged "Keynes Scholars".

Instead of reading Keynes's TP and Boole's LT, academicians have been substituting a reading of Ramsey's rubbish for the reading of Keynes's TP. This has led to Hishiyama's correct conclusion that Keynes's TP was never read. It is the failure of academicians to read Keynes's *A Treatise on Probability*. Academicians have simply been assuming that what Ramsey claimed about the *A Treatise on Probability had to be* correct because he was a genius. It is obvious that no one actually read page 11 of Keynes's book.

Keynes's definition of probability is the same as Carnap's probability$_1$, degree of confirmation, once we correct Carnap's misunderstanding about Keynes and the proper role of intuition. Keynes's use of intuition is not Moore's Platonic, metaphysical concept of intuition. It is identical to Boole's statements about apprehending the connections that exist between the propositions, all of which are related. There are no unrelated propositions in Boole's relational, propositional logic.

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