

Área 1 - História do Pensamento Econômico e Metodologia

Resumo: Atualmente, a busca por suporte ou conteúdo psicológico para as abordagens econômicas da tomada de decisão é objeto de pesquisa em evidência. Considerando a abordagem keynesiana e pós-keynesiana, é possível notar vários estudos que reivindicam a economia comportamental como suporte psicológico para a tomada de decisão. Este artigo adota uma perspectiva diferente, pois enfatiza o aspecto psicológico já presente nos escritos de Keynes e apresenta teorias psicológicas que analisam esse aspecto a fim de ressaltar o suporte psicológico da tomada de decisão de acordo com esse autor. Na análise, o artigo se baseia no estudo do papel da cognição, observação e reforço na tomada de decisão keynesiana.

Classificação JEL: B50, B59, D89

Palavras-chave: Tomada de decisão Keynesiana, cognição, observação, reforço, aprendizado vicário

Abstract: The search for psychological content or support to economic decision-making is a subject contemporaneously stressed. Taking Keynesian and Post-Keynesian economics into account, it is possible to perceive several approaches which reclaim behavioral economics as a psychological support to decision-making. This paper follows a different procedure. This article points out psychological issues already studied by Keynes and introduces psychological theories which analyze those issues in order to emphasize a psychological support to Keynes's decision-making. In doing so, this paper relies on the place of cognition, observation, and reinforcement in Keynesian decision-making.

JEL classification codes: B50, B59, D89

Key-words: Keynesian decision-making, cognition, observation, reinforcement, vicarious learning

1. Introduction

Behavioral economics are under the spotlight of economic science when the issue under consideration is the psychological content of an economic approach. Behavioral economics strongly relies on Hebert Simon's bounded rationality and satisfying behavior (Simon 1978 and 1979) and Kahneman and Tversky's heuristics and biases in decision-making, and prospect theory (Tversky and Kahneman 1974 and Kahneman and Tversky 1979). Nowadays, the latter are stressed. According to Fung (2010-11), behavioral economics embraces three main types of studies: psychological studies of economic behavior using psychological methods, economic studies applying findings of psychology to the study of economic behavior, and team studies involving both psychologists and economists. Surely, the most popular behavioral economics' type of study is the former. It is a consequence of the popularization of studies which rely on psychological findings applied to traditional economics in order to emphasize a theoretical failure, in Kahneman and Tversky's tradition. As stated by Camerer and Loewenstein (2002), this tradition established a *modus operandi* for behavioral economics' studies: (1) to identify normative assumptions or models which are extensively used by economists (such as expected utility); (2) to recognize clear violations of the assumption or model and point out alternative explanations; (3) to use the

violations as inspiration to create alternative models that generalize existing ones; (4) to construct models using the assumptions from (3), originate fresh implications, and test them.

Some research – such as Garner (1982), Harvey (1998), and Jefferson and King (2010-11) – have been reclaiming the use of behavioral economics in Keynesian and Post-Keynesian decision-making studies. Others – Dunn (2001), Dow (2009), and Fung (2010-11) for example – do not see the approach between behavioral economics and Keynesian and Post-Keynesian decision-making studies in a favorable light. Dunn (2001) refuses the approach between Keynesian uncertainty and behavioral uncertainty *a la* Hebert Simon. Dow (2009) affirms that Kahneman and Tversky's behavioral economics is based strictly on behavioral psychology. Decision-making as a procedure built through time, history, and people's experience is not a matter of behavioral psychology. It is focused on stable predictable relationships able to be modeled in stimulus-behavior logic. Consequently, behavioral psychology builds its analysis on a "black box" instrumentalist approach (Dow 2009). Fung (2010-11) criticizes studies, especially Jefferson and King (2010-11), which offers some reasons for cross-fertilization between Keynesian and Post-Keynesian decision-making studies and behavioral economics. For Fung (2010-11), affirmations about similar methodologies are likely to be somewhat superficial. Therefore, there is the necessity for behavioral economics to engage Keynesian and Post-Keynesian decision-making studies on a theoretical level for offering empirical approaches as it is doing (Fung 2010-11).

Despite that criticism of behavioral economics, the identification of the psychological content of economic approaches can offer essential findings and improvements. In fact, the actual "state of the art" of both economics and psychology suggests little interaction between these sciences. This low level of connection can be related to what is understood as decision-making by neoclassical economics. As the neoclassical approach has been mainstream economics for a long time, its conceptualization contaminated definitions and concept of the economic debate. Hence, economics, in a general sense, has been focused on different issues of decision-making than other sciences. Simon (1986) emphasized this point, highlighting that the economic concept of rationality is based on particular choices, but in other sciences rationality is a matter of processes. As a consequence, it is not strange that the most popular relationship between economics and psychology – behavioral economics – relies on a stimulus-behavior logic, which can be analyzed as particular choices. Regarding Keynesian and Post-Keynesian decision-making, Davidson (2010-11) may have indicated a bridge between economics and psychology, which will now be addressed.

Davidson (2010-11) is a comment on Jefferson and King (2010-11). The latter argued that the impact of behavioral economics on Post-Keynesian approach has been limited. Davidson (2010-11) turns this issue upside down, stressing that behavioral economics should learn from Keynes's and Post-Keynesian economics, and went far in affirming that Keynes was the first behavioral scientist. Davidson's perspective pointed out an interesting subject: Keynes's and Post-Keynesian decision-making approaches already take into account several psychological issues, such as conventions and uncertainty. In doing so, Keynes introduced his own psychological perspective. From a psychological standpoint, Keynes would be more than a behavioral scientist, as suggested by Davidson, as he dealt with elements of other branches of psychology. The goal of this paper is to highlight and reinforce the psychological content of Keynes's decision-making. It is a matter of stressing the psychological components which support the Keynesian approach and offers more explicit psychological clothing for them. The psychological complementarity here offered is other than behavioral economics. It relies on vicarious learning and cognitive dissonance theory.

Vicarious learning is the capacity of an individual to observe and interpret behaviors of others, identify who is a model of behavior, and imagine themselves in the place of the model as a way to learn by observation. Vicarious learning was introduced into psychology by Albert Bandura during the second half of 20th century. Bandura is an extremely important psychologist. In a publication entitled "The 100 most eminent psychologists of the 20th century", Bandura was classified as the fourth important psychologist and the main living one (see Warnick *et al* 2002). Bandura is one of the most significant psychological researches who broke with behaviorist approaches. Another one is Leon Festinger who introduced cognitive dissonance theory. Festinger

himself did not work with vicarious learning. His cognitive approach is not incompatible with Bandura's approach, however. Festinger is also an important psychologist, as his cognitive dissonance theory is recognized as an essential one. In "The 100 most eminent psychologists of the 20th century", Festinger is in the fifth position.

This paper emphasizes Keynes's decision-making as introduced by *A Treatise on Probability* (1921), *The General Theory of Employment, Interest, and Money* (1936), and *The General Theory of Employment* (1937). Hence, this paper does not avoid discussing the two perspectives of Keynes' decision-making, one introduced in 1921 and the other in 1936. The discrepancy between both approaches appears in the debate of their psychological tenor. The next section stresses the psychological content of Keynes's approach already introduced by him. In this item it is argued that the adoption of formal logic (probability) in decision-making implies an incomplete psychological perspective in *A Treatise on Probability*. The abandonment of formal logic by *The General Theory* made possible the incorporation of missing psychological variables in Keynes's decision-making. In this section, imagination and cognition are indicated as psychological variables which Keynes took into account in *The General Theory* and should have considered in *A Treatise on Probability*. Observation is a single psychological element which Keynes considered in both decision-making perspectives. Since observation, imagination, and cognition were identified as central in Keynes's decision-making, item 3 offers the association of Keynes' approach and psychological theories in order to place more explicit psychological clothing on the former. In doing so, section 3 emphasizes the place of Bandura's and Festinger's theories in Keynes's studies. Vicarious learning and cognitive dissonance theory are introduced as psychological support to Keynes' notion of conventions and the reason why the same support does not fit to the decision-making as analyzed in *A Treatise on Probability* is addressed. Item 4 discusses Keynes' weight of arguments and state of confidence according to vicarious learning and cognitive dissonance theory. Some final notes close the paper.

2. Observation and cognition in Keynes's approach of decision-making

Keynes's first approach to decision-making took place in *A Treatise on Probability* (1921). In this book, Keynes introduced his particular reading of probabilistic logic. In *A Treatise on Probability*, decision-making relies on given premises and a formal logic, probability, through which it is possible to associate those given premises with outcomes. Premises represent direct knowledge and outcomes characterize indirect knowledge. In Keynes (1921), direct knowledge, true knowledge, and observable knowledge are one and the same. Hence, direct knowledge, for Keynes, arises out of premises which a decision-maker learns by her/his own observation. Indirect knowledge is the issue of a theory of probability that indicates different degrees which in outcomes must be taken into account¹. For example, considering a decision-maker's premises as a set of propositions h and the outcomes a set of propositions a . If a knowledge of h validates a belief in a of degree α , it can be affirmed that there is a probability relation of a degree α between a and h . It can be written as $a/h = \alpha$. According to Keynes, this belief is rational. As a consequence, the concept of rational belief for Keynes (1921) means something different than neoclassical economics' terminology. In Keynes's (1921) approach, decision-maker's knowledge relies on the completeness of initial premises and an acceptable construction of a probability relation².

The generation of rational beliefs based on the association between a set of premises and probabilistic logic does not stop in a generation of a set of outcomes. Decision-makers can consider these outcomes secondary premises and use a logical relation to find new outcomes which can be themselves considered secondary (or tertiary) premises and so on. For Keynes (1921: 13): "It is not possible, however, to analyse the mental process in the case of indirect knowledge, or to say by perception of *what* logical relation we have passed from the knowledge of one proposition to knowledge about another" [emphasis in the original]. Despite the fact of considering the mental process in the case of an indirect knowledge unanalyzable, Keynes (1921) indicates that the

knowledge about one premise and its observation and examination in a logical relation to another proposition means an argument. Indirect knowledge is knowledge by argument. Summing up, Keynes (1921) makes a distinction between direct and indirect knowledge and between two ways of obtaining a belief – through observation and by argument. However, Keynes argued that it is impossible to affirm how the psychology through which decision-makers are able to indirectly acquire premises takes place. For Keynes (1921), connections between starting points – premises – and their consequent results – outcomes – have no relation to the decision-maker's features.

The association between premises and outcomes are matter of formal logic. The psychological issues of decision-makers are starting premises as decision-makers choose them. According to Keynes (1921), outcomes cannot be probable or improbable as no place can be intrinsically distant. The origin of the reference plays a key role. A decision maker's attention may be focused on her/his own knowledge as a starting point, then fix it on a projected conclusion and takes which degree of probability this would obtain from several sets of assumption. The result would be the *corpus* of knowledge of the decision-maker.

Obviously, to identify observable knowledge as true knowledge is a controversial subject. Plus this point offers vagueness to the distinction between observable knowledge and complete knowledge. If knowledge is incomplete, the decision-maker needs to somehow imagine what the probability relation is. In such situations, the decision-maker can imagine what necessary additional premises are, what missing parts of a premise are, what additional outcomes are, and what missing parts of outcomes are. In other words, the decision-maker can complete the premises and outcomes through her/his imagination. Some of those imaginary premises and outcomes can prove themselves true, but others may not. Hence, missing or incomplete observable premises can generate impossibility for decision-making in a sequential process (Cardim de Carvalho 1988).

Observable premises connected to outcomes demands a stability of the decision-making environment. Using Paul Davidson's words, the decision-making process in *A Treatise on Probability* demands an ergodic decision-making environment which does not regard a social decision-making procedure. Changeable premises, unobservable premises, and interpretation of premises in different ways are not part of the sequential process highlighted in Keynes (1921). In a social situation, interaction with others and events which rely on human subjectivism play a key role, hence formal logic has a too restrictive application. Taking cognition into consideration is to follow Shackle (1955) in assuming that a decision-maker does not choose an action based on a given list of possible behaviors, but a decision-maker imagines that list.

Summarizing, in *A Treatise on Probability*, Keynes's first approach to decision-making, observation plays a key role. As through observation, a decision-maker can achieve what Keynes (1921) calls true knowledge. This observation is based on a personal perspective as the decision-making chooses what is observed. However, to support that observation is based on decision-maker's features would be a strong affirmation. Because those personal features partly rely on the cognitive abilities of the decision-makers. Keynes (1921) does not take into account that different actors can interpret premises in different ways. Additionally, probability is a formal logic which has no relations to the decision-maker's personal reasoning. The decision-making psychology in *A Treatise on Probability* is based on observation and it also should be based on cognition and imagination. The latter would be central to decision-making under incomplete knowledge (premises). Imagination and cognition seems to be missing psychological elements in Keynes (1921).

Keynes second approach to decision-making – *The General Theory of Employment, Interest, and Money* – abandoned formal logic as a key subject, but observation remained a central psychological issue. Also cognition and imagination arose in the analysis. In the logic introduced by *The General Theory*, the future is unknowable, but it is not unimaginable (Dixon 1986). Not only may some elements of decision-making be unknown but also others may be unknowable during the decision-making process (Cardim de Carvalho 1988). Hence, the possible results of decision-making come from the imagination. Decision-makers must imagine the future in order to choose; what is missing does not exist and must be imagined. In Keynes's second approach to decision-

making, imagination is strongly associated with both observation and cognition. Imagination arises from the social nature of decision-making (Dixon 1986). The key issue is that the decision-maker is not alone. She/he can be unable to know the consequences of her/his own decisions, but the decision-maker can imagine the results of the decision-making by the observation of the consequences associated with the choice of others. Furthermore, those consequences are not only observed but interpreted by the decision-maker. What is still missing also remains in the imagination. This decision-making scenario was analyzed by Keynes, and is analyzed by Post-Keynesians, taking uncertainty and the role played by conventions into consideration³.

For Dequech (1999: 415-416), Keynesian uncertainty regards “situations in which at least some essential information about the future events *cannot be known at the moment of decision* because this information does not exist and cannot be inferred from any existing data set” [emphasis in the original]. Therefore, Keynesian uncertainty is characterized by the absence of reliable knowledge about the results associated with any decision. Uncertainty in decision-makers’ minds is generated by possible consequences of an event. For Keynes, uncertainty is not the opposite of formal logic, uncertainty mean that formal logic is not applicable. Uncertainty does not mean a totally random process either. Even if, in an uncertain environment, decision-making is related to confidence, expectations, and social conventions⁴.

Taking Keynes’s definition of convention into consideration, Dequech (2011) stresses an essential subject: Keynes did not clearly define the concept of convention he was working with. Consequently, nowadays we can perceive several interpretation of this concept. For instance, Darity and Horn (1993) analyze Keynes’s convention as a rule of thumb. Another usual interpretation is Keynes’s convention as average opinion – more conventional economists use this one. Lawson (1991) refutes Darity and Horn’s argument and Dequech (2011) contests the latter. For Lawson, rules of thumb can be only a particular decision-maker’s matter, it can exist just in an individual logic which is different from the behavior of others that can be observable. Dequech affirmed that the average opinion can be an outcome from several different opinions and a behavior which is not related to the idea of collective or similar behavior.

Instead of offering a possible Keynesian concept of convention, Latsis, De Larquier, and Bessis (2010) addresses general features of it: (1) a convention involves coordination between agents; (2) a convention involves regularities in behavior; (3) a convention is arbitrary; and (4) a convention is a response to uncertainty. Highlighting the importance of conventions to decide in an uncertainty environment, Garner (1982) affirms that, according to Keynes, decision-makers deal with uncertainty by assuming that the present is an adequate guide to the future, the existing state of opinion summarizes the future scenario, and conformity with the behavior of the majority (see also Keynes 1937). Keynes (1936) affirms that a convention implies that a decision-maker who considers it in her/his theorizing process also considers that the existing state of affairs will continue except if there are specific reasons to expect a change.

In analysis of the concept of convention in Keynes’s approach, his beauty contest example is regularly mentioned. To address the place of imagination and cognition in Keynes’s notion of convention, it seems to be illustrative to make a reference to such an example. As stated by Keynes (1936: 156):

“...newspaper competitions in which the competitors have to pick out the six pretties faces from a hundred photographs, the prize being awarded to the competitor whose choice most nearly corresponds to the average preferences of the competitors as a whole; so that each competitor has to pick, not those faces which he himself finds prettiest, but those which he thinks likeliest to catch the fancy of the other competitors, all of whom are looking at the problem from the same point of view.”

In the beauty contest illustration, the aim is to identify who is judged as candidate to the prettiest faces. Accordingly, a decision-maker should take into account what others would think that the most beautiful faces are. The opinion of the decision-maker does not matter. Knowledge of the decision-making of others is the central issue. “Keynes’s beauty contest” exemplifies a feature of his approach of convention – also highlighted by Bibow, Lewis, and Runde (2003) – Keynesian

convention is much more about conventional judgment rather than a convention *ipsis litteris*. Conventional judgment implies decision-makers assume that the other may be better informed (Keynes 1937 and Dequech 2003). From a conventional judgment perspective, the interpretation of what others think is the key subject. Taking Keynes's example into consideration, to win the prize the central issue is to consider what others comprehend and decide accordingly. A misinterpretation implies in being out of the competition. Consequently, cognition is an important psychological variable in Keynes's concept of convention and consequently in his decision-making as stated by *The General Theory*.

Different from Keynes's first approach to decision-making, the observation of conventions is based on the observation of the behavior of others. Imagination is associated with Keynes's convention as it demands decision-maker's capacity to imagine herself/himself in the place of the observed in order to achieve similar results. For a better development of the place of observation and cognition in Keynes' second approach to decision making, Bandura's and Festinger's studies must be taken into consideration.

3. Enter the psychology

According to vicarious learning theory, the decision to behave is a result of the creation of knowledge from the perspective of the decision-maker as someone who observes and interprets what occurs around her/him. Through observation of others, people create knowledge about behaviors and learn how to behave (Bandura 1971 and 1986). Knowledge, vicariously created, is used as the basis of future observations, consequent behaviors, and their reinforcements, adaptations, or changes. Vicariously, a personal background to decision-making is generated and reviewed. Bandura (1971) highlights that virtually all learning phenomenon results from direct experience, but there is no need for a living situation or a physical interaction among people for a person to gain knowledge. Learning can occur on a vicarious basis through the observation of behaviors of others and their consequences for others (Bandura 1971 and 1986).

A key point to vicarious learning is: if something is vicariously learned, someone is recognized as a model of behavior. Observing a model, a person can avoid mistakes when unknown or unfamiliar behavior must take place. In Keynes' first approach to decision-making, premises are the observable subjects. In Keynes's second approach, behaviors of others are the targets for observation. Taking the former into account, the observation of premises can be slightly compatible to the vicarious learning perspective. One may argue that this compatibility is true when premises are behavioral propositions. However, there are more reasons for the incompatibility. By arguing that probability is a formal logic not related to the decision-maker – as it is a matter of the world not of people – Keynes (1921) isolates the decision-making process and its outcomes from the vicarious learning perspective. Because, in the vicarious learning theory, the logic which would associate premises to outcomes are socially and vicariously learned. Plus, if by observing others a decision-maker learns which behaviors generate desirable outcomes, outcomes are observable. For Keynes (1921), outcomes are not necessarily observable, as result of premises and a formal logic if both are available the outcome will be there, observed independently. To make a connection between Keynes (1921) and vicarious learning, we must consider that the formal logic and the outcomes are not only observable but also able to be learned by observation. As a result, the vicarious learning perspective does not fit with the decision-making according to Keynes (1921). The same is not true of Keynes' second approach to decision-making.

For vicarious learning to be possible there are two necessary decision-makers: the observer and the model (otherwise, vicarious learning is meaningless). The observer watches a behavior — or gives attributes to it — of the model. In “Keynes's beauty contest”, the newspaper reader is the observer and the others participants of the context play the model's role. In a vicarious learning situation, the subsequent behavior of the observer becomes more similar to the observed, or alleged behavior of the model (Flanders 1968). In Keynes's example, it would be the choice of the beauties'

faces. Following the vicarious learning logic, observers recognize the behavior of the model as a source of how to behave in a desirable way. The procedure through which observers identify a model and learn what a desirable behavior is, and what it means, relies on the cognitive abilities of a decision-maker. Learning, even if vicariously, cannot take place without awareness of what the model is and what is being reinforced. Comprehension occurs through cognitive abilities. That awareness is a result of the decisions and actions of individuals who behave according to what they understand as a chain of associations developed and conditioned by previous information and their expected answers (Bandura 1971 and 1986). To be aware of what was learned means that people can theorize about how to behave. Hence, cognition implies in building and categorization which are based on some form of selection and interpretation of behaviors (Fernández-Huerga 2008 and Neisser 1976). Coming back to Keynes's example one more time, the decision-maker must have a notion of what is considered a beautiful face in order to take part in the beauty contest.

For Bandura (1986), through the observation of performance of others, a decision-maker acquires not only patterns of behavior but also a cognitive framework about what some behaviors mean. As the notion of what beauty is comes from what other people think and demonstrate about that, it is a matter of socially created a concept. Consequently, models can also interfere in the behavior of people symbolically and such representations can be used later by decision-makers to guide their behaviors. Misunderstandings connected to behavior can be solved by symbols without taking into consideration the various possible alternatives of action. The central role of cognitive abilities in vicarious learning is the decision-makers' interpretation of symbols according to which behaviors implies in desirable results. There are some situations in which the observer is unable to comprehend the relevant attributes or related behavior involved in a desirable result. When a situation like that takes place, there is cognitive dissonance, which is an inconsistency between what is understood as a model and what is comprehended as desirable result (Festinger 1957). When decision-makers are able to perceive that they are in a cognitive dissonant situation they try to make it stop since what is understood as desirable result cannot be achieved. The attempt to avoid cognitive dissonance usually occurs through the replacement of the behavior-result relationship, which comes from observation of other potential models.

The classical example of cognitive dissonance is Festinger's (1957) smoker. A smoker, who has learned that the result of such a decision is ill-health (something which eventually happens to smokers), is in a cognitive dissonant situation. Hence, to understand this result as desirable is not possible anymore. There are two possibilities for the occurrence of a new cognitive consonance: (1) a modification of behavior because the new information about the behavior shows the bad effects of smoking, consequently the smoker may stop, or try to stop, smoking; and (2) a reinforcement of smoking behavior; in this case the change focus is on the good effects of smoking (Festinger 1957). If a behavioral change occurs, modification is not automatic and neither is the perception of information that reinforces behavior. In both cases the cognitive dissonance will be eliminated. However, as the example illustrates, it is impossible to affirm that the perception of demeaning information about the responses will generate modification in behavior and its result. The interpretation of the behavior can be what changes. So, it is possible to address another reason for the impossibility of complementarity between Keynes's first approach to decision-making and vicarious learning. Taking cognition into consideration, what a premise means to a decision-maker can change and does not match with the ergodic decision-making environment of Keynes (1921). Considering Keynes's second approach to decision-making, to follow a conventional behavior is deeply based on cognitive consonance. The conventional judgment exists because decision-makers are able to cognitively relate desirable results to some socially established behaviors. Someone chooses to participate in a beauty contest, as suggested by Keynes, if she/he thinks that she/he is able to comprehend what is the collective cognitive consonance of the concept of beauty.

A vicarious learning perspective of Keynes's second approach to decision-making also highlights the importance of groups. Keynes himself stressed such significance by dealing with the state of affairs and state of opinions in his concept of convention and conventional judgment. Groups play a key role in introducing to decision-makers how to identify the state of affairs and the

state of opinions in a society – such as the meaning of beauty. This identification occurs by presentation of what a model is and what it means, and in reinforcing decision-makers' theorizing procedures. Groups emphasize a set of cognitive consonance which indicates to decision-makers' what models are. Within a group, cognitive consonances can be stronger because a group generates a snowball effect on models. Information snowballs take place when decision-makers are motivated to follow the behavior of others by their recognition and reinforcement in several different models. When a group is observed, the relationship established is not just between an observer and a model, but between an observer and models. Additionally, observers try to behave as the models; if they succeed, they will become a model themselves. This procedure generates a self-supporting snowball effect and, consequently, models highlighted and legitimized by the group. Groups imply socially highlighted behaviors. When socially highlighted behaviors take place, the first reaction of others is to pay attention to it (Bandura 1971). Only by the occurrence of attention can a model be established, thus attention is the first step in vicarious learning. People can comprehend by vicarious observation only if they are paying attention. Clearly, it is also a matter of cognitive consonance, because decision-makers just pay attention to what they understand as something relevant to their own behaviors.

So far, the vicarious learning approach of Keynes's decision-making stressed the mimetic behaviors associated to conventions. A vicarious learning reading of Keynes's theory allows a theoretical connection to other examples of decision-making analyzed by Keynes, such as investment and entrepreneurial decisions. In both examples, a decision-maker should take into account the decision-making of others in the formulation of her/his own logic and expectations about what is more likely to occur. Keynesians and Post Keynesians – such as Cardim de Carvalho (1988), Davidson (1982-83), and Dequech (2003) – usually emphasize the possibility of crucial choices in decision-making. Crucial choices are associated with Keynesian decision-making as the possibility of one action changing the decision-making environment in a way that did not exist before (Cardim de Carvalho 1982 and Davidson 1982-83). The Schumpeterian entrepreneur is frequently cited as example of crucial actions. From a Schumpeterian perspective, the entrepreneur is the one who is able to promote an innovation and achieve extra-profit from this. Innovation is the introduction of a good or (part of) a productive process which did not exist before. An innovation changes the market and the competitive process in a way that could not be predicted even by the innovative entrepreneur (see Schumpeter 1911, especially chapter 2).

According to Dequech (2003), innovative behavior is unconventional, at least partly, as a decision-maker rarely thinks in a totally unconventional way. Additionally, it is difficult to break with all existing conventions at the same time. Rarely, a Schumpeterian entrepreneur innovates not following a path dependency (see Arthur 1994 and David 1985). The economic system needs some level of stability to work, hence some conventions are necessary even from an innovator. Davidson introduces this discussion in a complementary way. Davidson (1982-83) highlights that the decision-making environment changes through, and are influenced by, historical time. History means that what was vicariously learned before in a society supports today's decision-making. Vicarious learning and social support does not signify replicability. Models and cognitive consonances hold up decision-making's logic but do not determine choices and behavior. People learn logics and how to apply them in their decision-making method which is different from determinism. There is a dynamic process. The next section emphasizes why some logics and behavior are more emphasized than other in this dynamic process.

4. Reinforcement, confidence, and the weight of arguments

The shifting of Keynes's decision-making approach from *A Treatise on Probability* to *The General Theory* relies on a transposition from probabilistic logic to a logic internal to decision-makers. Because of this change, Keynes's decision-making become more pleasant to human psychology. For Cardim de Carvalho (1988), a dichotomy between external and internal logic had

arisen during the time Keynes wrote *A Treatise on Probability* in the discussion of the weight of arguments. In *A Treatise on Probability*, new evidence does not reveal any new logical link between premises and outcomes, nor denies any other. It just corroborates or repeats an already known argument. In these conditions, this new evidence may not change a probability but it alters its 'degree of belief' (Keynes 1921). However, this logic does not fit with the content of *A Treatise on Probability*. Because if the premises are true knowledge and their manipulation is logic, the weight of an argument is irrelevant. For Cardim de Carvalho (1988), this is a not a highlighted point in *A Treatise on Probability* as Keynes deals with weight of arguments isolated from the rest of his analysis; this discussion was recovered later in *The General Theory* under the debate around states of confidence.

The similarity between weight of arguments and state of confidence is not crystal clear among Keynesians and Post-Keynesians. There are researchers who take the similarity into account, such as Cardim de Carvalho (1988) and Darity and Horn (1993). But there are others – likes Dequech (1999) and Runde (1990) – who do not necessarily understand the concepts as similar. For Dequech (1999), this difference is based on the fact that the weight of an argument is an issue of how uncertainty is perceived, and confidence depends also on an uncertainty aversion. Despite introducing a difference in conceptualization, Dequech (1999) offers a way to link weight of arguments to confidence by affirming that if weight is somehow related to the degree of completeness of the evidence, weight can be related to confidence. Runde (1990) highlights that Keynes denoted the weight of argument as (1) representing the amount of relevant evidence, (2) the degree of completeness of the evidence, and (3) the balance of absolute amounts of relevant knowledge and relevant ignorance. For Runde (1990) these different definitions are not fully consistent and subject to interpretation. Fontana and Gerrard (2004) point out that decision-making under uncertainty depends not only on an assessment of the relative degrees of belief attached to alternative behaviors but also an assessment of the absolute extent of the evidential base relating to the whole set of alternative behavioral results. This evidential base can be understood as both weight of arguments and state of confidence. For a discussion of the psychological content of Keynes's decision-making, which takes cognition into account, the way in which the environment is perceived by decision-makers plays the key role. If interpretation is the highlighted issue, the weight of arguments can be understood as state of confidence.

The weight of argument and state of confidence are connected to the psychological support offered by this paper through the psychological variable reinforcement. The reinforcement stresses how much a behavior is highlighted in a decision-making environment. The reinforcement is directly connected to the perception of the expressivity of some behaviors for decision-makers. In a vicarious learning decision-making environment, a relationship between an observer and a model has informative and reinforcing functions (Bandura 1971 and 1986). The former takes place by the recognition of the behavior of a model as a desirable one. The latter is connected to the behavior of a model as a supporting element in the behavior of an observer. Relationships among observers and models have different intensities; what determines if a relationship is weak or strong is the level of its reinforcement (Bandura 1965 and 1971 and Bandura, Ross and Ross 1963). When the observer perceives a strong reinforcement, a strong relationship is formed which implies in a high confidence in the desirability of such behavior. The relationship is weak when reinforcement is feeble which suggests a low confidence in what the behavior can achieve. There are three main different types of reinforcement: (1) vicarious reinforcement; (2) cognitive reinforcement; and (3) self-reinforcement (Bandura 1986). The former is the effect of observation of a model, and its behavioral consequence, after the establishment of a relationship. Vicarious reinforcement reaffirms the behavior of the observer through a continuous observation of the behavior of the model (Bandura 1971 and Flanders 1968). The behavior of an observer also vicariously reinforces the model by a snowball effect.

Bandura and Mischel (1965) point out that vicarious learning is encouraged through exposure to models, but once a person has developed an adequate symbolic repertoire, the model can be replaced by a symbolic one which can be cognitively reinforced. As a result, there is not only

a vicarious reinforcement, but also a cognitive one. According to Festinger (1957), decision-makers feel pressure to produce consonant relationships among meanings and behaviors and thus avoid dissonance. This pressure relies on social learning. In a society, there is a socially built path of meanings and behaviors that a decision-maker can adopt to interpret behaviors and to generate relationships with models. Through a collective comprehension, the cognitive dissonance is usually reduced. Festinger (1957) highlights that culture or group standards can present what fits in a cognitive sense. In Earl and Wicklund's (1999) explanation, a decision-maker can achieve consistency in her/his cognitive abilities by taking the path that is more resistant to change. That would be conventions in Keynes's theory. Following this perspective, conventional behavior would be directly associated with state of confidence.

Taking into account a behavior already understood and its reinforcement, it is very likely that such a behavior will occur again when the person faces the same, or a similar, context. Repetition occurs when decision-makers are familiar with the observation of the same model several times, which occurs not only as a result of a snowball effect, but also through the perception of the same or similar scenario where an already learned behavior created a desirable result. Repetition also strongly relies on cognitive consonance and the ability of the decision-maker in theorizing what had been vicariously learned. As a consequence of vicarious learning, repetition is based on a model frequently exposed to the observance of decision-makers; within this logic, repetitive behaviors express models continually and powerfully reinforced which culminates in the self-reinforcement. Self-reinforcement takes place when decision-makers behave based on a previous behavior they vicariously learned; self-reinforcement happens when what was vicariously learned becomes present in an inner part of the decision making-process.

The repetition, which culminates in the self-reinforcement, does not need an ergodic world to take place. A decision-maker can use the knowledge acquired through vicarious learning in similar situations as occurred before. Knowledge can be adapted and consequently be useful in a non-ergodic environment. The use of the experience can take place in another scenario. Through the development of societies, models spread and, consequently, they become something regular in the behaviors of those able to behave accordingly. From a vicarious learning perspective, decision-makers are able to perceive and comprehend which models of behavior fit with which decision. Observation still happens but models of behavior and cognitive consonances were already being internalized by decision-makers. Hence, observation is not strictly necessary for a decision. Vicarious learning is still occurring, however⁵. When a behavior is self-reinforced, it is associated with a high state of confidence.

5. Final Comments

Nowadays, it is usual to reclaim psychological content for economic decision-making based on behavioral economics. This paper outlines a different proposition: to connect the psychological content of Keynes's decision-making to psychological studies which take that content into account. In doing so, this article highlights the place of vicarious learning and cognitive dissonance theory in Keynes's approach of decision-making. Initially, it is argued that the psychological content of *A Treatise on Probability* would be incomplete. This book regards only observation as a central psychological element and its analytical perspective would demand also notions of imagination and cognition. The substitution of the use of formal logic (probability) for uncertainty decision-making environment – which took place in *The General Theory* – leads the psychology of Keynes's decision-making to consider also imagination and cognition (the missing variables of the first book).

Despite the presence of the variable observation, the content of vicarious learning theory does not fit the psychological perspective offered to observation by *A Treatise on Probability*. Vicarious learning demands learning by observation of behavior of others and the behavioral results for them. Hence, an approach between vicarious learning theory and the psychology of *A Treatise*

on Probability would request the consideration of just behavioral premises. Keynes (1921) is broader than that. Plus, the outcomes resulting from premises must also be observable. In *A Treatise on Probability*, if premises are known, formal logic can be applied, and the outcome would be available; observation of outcomes is not necessary. Furthermore, a cognitive approach implies that meanings of premises can change. This possibility addresses a decision-making environment different than the one drawn by Keynes (1921). This difference relies on the dichotomy between ergodic and non-ergodic decision-making environment. Taking the analysis conducted by this paper, it is not possible to assume that Keynes provided a psychological basis for decision-making in *A Treatise on Probability*. The same is not true for *The General Theory*. It could be understood that *The General Theory* offers a more coherent and complete psychological perspective than *A Treatise on Probability*.

The notion of vicarious learning and cognitive consonance perfectly fits Keynes's decision-making as emphasized by *The General Theory*. The former gives a behavioral perspective and the latter a cognitive standpoint for the place of conventions in decision-making. However, vicarious learning does not offer a theoretical connection just to the place of convention in decision-making. Crucial decisions can be also analyzed from the psychological perspective here emphasized, as well as the notion of weight of arguments. From a psychological perspective, weight of arguments and state of confidence can be understood as one and the same. Considering the psychological content introduced by this article, weight of arguments are connected to reinforcement of what can be vicariously learned in a decision-making environment. The level of reinforcement determines if a link between an observer and a model is feeble or robust. When this relationship is strong, an expressive confidence that the behavior of a model is a desirable one takes place. This reinforcement can occur in three different, but not exclusionary, ways: vicarious reinforcement, cognitive reinforcement, and self-reinforcement.

Obviously, this paper does not exhaust the discussion about the psychology of Keynes's decision-making. On the contrary, this paper points out a psychological perspective of some elements of Keynes's decision-making. Studies constructed on others psychological perspectives and analysis of other elements would be enriching for the building of Keynes's psychologically based decision-making.

Notes

1. Different degrees of probability to Keynes (1921) lead the debate for the weight of arguments. It is a central issue in *A Treatise on Probability*. It is also important to understand Keynes's decision-making as an evolution from Keynes (1921) to Keynes (1936). Minor references are made to weight of arguments in this section, however, as it is a key issue of the section 4.
2. Keynes's discussion about direct and indirect knowledge also requests the notion of *direct acquaintance*. According to Keynes (1921), acquaintance is not knowledge but the base on which knowledge develops. Acquaintance relies on thoughts, ideas, and meanings which constitute decision-makers' experience, perception, and understand of the world around them. Sensations, meanings, and perceptions are objects of direct acquaintance. Despite the fact that direct acquaintance composes decision-maker's logic for Keynes (1921), it does not play as central a role as direct and indirect knowledge. Hence, this paper focuses in the latter as elements which compose Keynes's first approach to decision-making.
3. The notion of Keynesian uncertainty has been highly debated and documented. To sum up the discussion, for the purpose of this paper, seems to be repetition of contributions already published. Important contribution can be found in Cardim de Carvalho (1988), Davidson (1982-83), Dequech (1999, 2003, and 2011), Lawson (1988), and Palley (1993).

4. The Keynesian approach of conventions and their relation to an uncertainty decision-making environment are explored in this section and in the next one. Confidence and expectations are issues associated to the item 4.
5. Other branches of economics science use specific terminologies for vicarious knowledge already retained and known by decision-makers. Thorstein Veblen, in his institutionalist theory, called it institutional furniture (Veblen 1899). Social economy usually uses the name practices (see Dolfsma 2009).

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