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The role of observation, cognition, and imagination in Keynes's approach to decision-making

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Abstract

The search for psychological content or support for economic decision-making is a subject that is contemporaneously stressed. Considering Keynesian and Post-Keynesian economics, it is possible to perceive several approaches that reclaim behavioral economics as a psychological support for decision-making. This study follows a different procedure. It points out the psychological issues studied by Keynes and introduces psychological theories that analyze these issues in order to emphasize psychological support for Keynes's approach to decision-making. In doing so, this study relies on the role of observation, cognition, and imagination in the Keynesian perspective on decision-making.

JEL classification: B50; B59

Keywords: Keynesian decision-making; Cognition; Observation; Imagination; Vicarious learning

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1. Introduction

Analysis of decision-making is strongly associated with psychology—the scientific study of thought, reasoning, theorizing, and behavior. Therefore, humanities and social sciences researchers should use psychological theories or issues in order to improve their approaches. In economic science, this cross-fertilization improvement is usually associated with behavioral economics. Behavioral economics relies strongly on Herbert Simon's bounded rationality and satisfying behavior (Simon, 1978, 1979) and Kahneman and Tversky's heuristics and biases in decision-making and prospect theory (Tversky and Kahneman, 1974; Kahneman and Tversky, 1979). Nowadays, the latter approach is stressed. According to Fung (2011), behavioral economics embraces three main types of studies: (1) psychological studies of economic behavior using psychological methods, (2) economic studies applying the findings of psychology to the study of economic behavior, and (3) team studies involving both psychologists and economists.

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Undoubtedly, psychological studies are the most popular type of behavioral economics. This is a consequence of the popularization of studies relying on psychological findings applied to traditional economics in order to emphasize theoretical failure in the tradition of Kahneman and Tversky. As stated by [Camerer and Loewenstein \(2002\)](#), this tradition establishes a *modus operandi* for behavioral economic studies to (1) identify normative assumptions or models that are extensively used by economists (such as expected utility), (2) recognize clear violations of the assumption or model and point out alternative explanations, (3) use the violations as inspiration to create alternative models that generalize existing ones, and (4) construct models using the assumptions developed in step (3), devise fresh implications, and test them.

Some research, such as [Garner \(1982\)](#), [Harvey \(1998\)](#), [Jefferson and King \(2011\)](#), and [Koutsobinas \(2014\)](#), reclaims the use of behavioral economics in Keynesian and Post-Keynesian decision-making studies. Others—for example, [Dunn \(2001\)](#), [Dow \(2009\)](#), and [Fung \(2011\)](#)—do not view this approach favorably. [Dunn \(2001\)](#) refutes the approach between Keynesian uncertainty and behavioral uncertainty *a la* Herbert Simon. [Dow \(2009\)](#) affirms that Kahneman and Tversky’s behavioral economics is based strictly on behavioral psychology. Decision-making is a process built over time and through history and people’s experiences, all of which differs from the perspective of behavioral psychology. Behavioral psychology focuses on stable predictable relationships that can be modeled using stimulus-behavior logic. Consequently, behavioral psychology analyses are based on a “black box” instrumentalist approach ([Dow, 2009](#)).

[Fung \(2011\)](#) criticizes studies that offer reasons for cross-fertilization between Keynesian and Post-Keynesian decision-making studies and behavioral economics, especially [Jefferson and King \(2011\)](#). For [Fung \(2011\)](#), affirmations about similar methodologies are likely to be somewhat superficial. Therefore, it is necessary for the field of behavioral economics to engage Keynesian and Post-Keynesian decision-making studies on a theoretical level in order to offer empirical approaches ([Fung, 2011](#)). This theoretical engagement is not necessarily possible; as [Dow \(2011\)](#) stresses, the psychological research that supports behavioral economics is compatible with the methodological individualism of mainstream economics—a psychology of atomistic decision-makers—but is not compatible with a Keynesian perspective.

Despite such 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. Regarding Keynesian and Post-Keynesian decision-making, [Davidson \(2011\)](#) may have revealed a bridge between economics and psychology: both the Keynesian and Post-Keynesian decision-making approaches already take into account some psychological issues, such as conventions and uncertainty. In doing so, Keynes introduces his own psychological perspective, which can be further explored by association with psychology (see [Dow, 2009](#)). One can perceive a growing agenda of studies in line with the [Davidson \(2011\)](#) study, such as [Dunn \(2001\)](#), [Dow \(2009\)](#), [Dow \(2011\)](#), [Davidson \(2011\)](#), [Jefferson and King \(2011\)](#), [Fung \(2011\)](#), and [Koutsobinas \(2014\)](#). Some of these studies consider behavioral economics, while others reject it (as previously highlighted). Hence, we may assume that the 21st century is witnessing the growth of an important research agenda with respect to the analysis of Keynes’s writings, and exploring the psychological content of Keynes’s decision-making. This study is also part of the aforementioned growing research agenda (as stressed by [Davidson \(2011\)](#), which took into account the psychological content already present in Keynes’s writings). The psychological complementarity to Keynes’s writings offered here relies on vicarious learning and cognitive dissonance theory.

Vicarious learning is the capacity of decision-makers to observe and interpret the behavior of others, identify models for behavior, and imagine themselves in the place of the models as a way to learn by observation. Vicarious learning was introduced into psychology by Albert Bandura, an extremely important psychologist, during the second half of the 20th century. In a publication entitled, “The 100 most eminent psychologists of the 20th century,” Bandura was classified as the fourth most important psychologist and the main living one (see [Warnick et al., 2002](#)). Bandura is one of the most significant psychologists to break with behaviorist approaches. Another is Leon Festinger, who introduced cognitive dissonance theory, which is recognized as an essential psychological theory. In “The 100 most eminent psychologists of the 20th century,” Festinger is in the fifth position.

There are certain economic studies that do consider cognitive dissonance theory. In the 1960s, Albert Hirschman had suggested understanding cognitive dissonance theory as “modern psychology,” noting its importance in conducting economic studies ([Hirschman, 1965](#)). Hirschman’s proposal was later implemented in (1) traditional economics studies, such as [Akerlof and Dickens \(1982\)](#) and [Gilad et al. \(1987\)](#), and (2) economic psychology analysis, such as [Maital \(1982\)](#) and [Earl \(1992\)](#). So far, other studies have avoided Festinger’s theory in their analysis of decision-making according to Keynes or Keynesians. [Portelli \(2013\)](#) quotes [Festinger \(1957\)](#) in his explanations on confidence and

social conventions for Keynes; however, the study is not an application of Festinger's theory, but offers only a brief association. Generally, the application of Bandura's vicarious learning seems to be uncommon in economic studies.

This study emphasizes Keynes's approach to decision-making as introduced in *A Treatise on Probability* (1921), *The General Theory of Employment, Interest, and Money* (1936), and *The General Theory of Employment* (1937). Hence, this study discusses the two perspectives of Keynes's approach to decision-making, the first introduced in 1921 and the second in 1936. The discrepancy between both approaches appears in the debate of their psychological tenor. Section 2 stresses the psychological content introduced in Keynes's approaches. On this point, it is argued that the adoption of probabilistic logic in decision-making implies missing psychological variables in *A Treatise on Probability*. The abandonment of the logic of *A Treatise on Probability* in *The General Theory* makes possible the incorporation of missing psychological variables in Keynes's perspective on decision-making. In this section, observation, imagination, and cognition are indicated as the psychological variables that Keynes takes into account in *The General Theory*. The last two psychological variables are those missing from *A Treatise on Probability*. Observation is a single psychological element that Keynes considered in both decision-making perspectives. Because observation, imagination, and cognition are identified as central to Keynes's perspective on decision-making, Section 3 analyzes the association between Keynes's approach and psychological theories in order to place more explicit psychological emphasis on the former. In doing so, it emphasizes the role of Bandura's and Festinger's theories in Keynes's studies. Vicarious learning and cognitive dissonance theory are introduced as psychological support for Keynes's decision-making discussed in *The General Theory*. In addition, Section 3 addresses why the same support does not fit with the decision-making analyzed in *A Treatise on Probability*. Section 4 discusses the weight of arguments and state of confidence according to vicarious learning and cognitive dissonance theory. Some final notes close the paper in Section 5.

2. Identifying psychological variables in Keynes's approaches to decision-making

Keynes's first approach to decision-making appears in *A Treatise on Probability* (1921). In this book, Keynes introduces his perspective of probabilistic logic. In *A Treatise on Probability*, decision-making relies on given premises and a logic—probability—through which it is possible to associate the premises with outcomes. Premises represent direct knowledge and outcomes characterize indirect knowledge. In *A Treatise on Probability*, direct knowledge, true knowledge, and observable knowledge are the same (Cardim de Carvalho, 1988). Indirect knowledge is the issue of a probability theory that indicates different degrees in outcomes that must be taken into account.¹ For example, consider a decision-maker's premises as a set of propositions, h , and the outcomes as a set of propositions, a . If knowledge of h validates a belief in a to degree α , it can be affirmed that there is a probability relation of degree α between a and h . This can be written as $a/h = \alpha$. According to Keynes (1921, Chapter I), this belief is rational.² Therefore, in Keynes's (1921) approach, a decision-maker's knowledge relies on the completeness of the initial premises and an acceptable construction of a probability relation.³

The generation of rational beliefs based on the association between premises and probabilistic logic does not stop with the generation of a set of outcomes. Decision-makers can consider these outcomes as secondary premises and use a logical relation to find new outcomes that can themselves be considered secondary (or tertiary) premises. As stated by O'Donnell (1990, p. 254), Keynes's probability means "a logical relation between virtually any pair of propositions." For Keynes (1921, p. 13), "[i]t is not possible, however, to analyze the mental process in the case of indirect knowledge,

¹ Different degrees of probability in Keynes (1921) lead the debate on the weight of arguments. The weight of arguments is a central issue in *A Treatise on Probability* and is an important subject for understanding the evolution of Keynes's approach to decision-making from Keynes (1921) to Keynes (1936). It is discussed in detail in Section 4. It is extremely important to stress that the content of Section 2 does not take into consideration Chapter VI of *A Treatise on Probability*. This chapter is considered by Section 4. This is because Keynes deals with the weight of arguments in isolation from the rest of his analysis in *A Treatise on Probability* (Cardim de Carvalho, 1988). Consequently, the weight of arguments, degree of belief and states of confidence can be found in the final part of this paper. Section 2 relies on Keynes's probabilistic logic emphasizing the place of premises, outcomes, and knowledge about their association and by argument

² Consequently, the meaning of the concept of rational belief in Keynes (1921) differs from the terminology of mainstream economics

³ In addition, Keynes's discussion about direct and indirect knowledge requires the notion of *direct acquaintance*. According to Keynes (1921), acquaintance is not knowledge but the base on which knowledge develops. Acquaintance relies on the thoughts, ideas, and meanings that constitute decision-makers' experiences, perceptions, and understanding of the world around them. Sensations, meanings, and perceptions are objects of direct acquaintance. Despite the fact that direct acquaintance constitutes a decision-maker's logic for Keynes (1921), it does not play as central a role as direct and indirect knowledge do. Hence, this study focuses on the latter as an element that constitutes Keynes's first approach to decision-making.

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 considering mental processes with regard to indirect knowledge to be unanalyzable, Keynes (1921, Chapter II) indicates that knowledge about one premise and its observation and examination in logical relation to another proposition constitutes an argument. Indirect knowledge is knowledge by argument. Summing up, Keynes (1921) makes a distinction between direct and indirect knowledge and between observation and argument. However, Keynes argues that it is impossible to confirm how the psychology through which decision-makers can indirectly acquire premises occurs. Probability as stated by *A Treatise on Probability* is not a matter of psychology because connections between premises and outcomes are not related to decision-making procedures (Keynes, 1921, Chapter II). Rather, the association between premises and outcomes is a matter of logic, which is an issue of the external world.

According to Keynes (1921), outcomes cannot be probable or improbable just as no place can be intrinsically distant. The origin of the reference plays a key role. A decision-maker focuses on her or his own direct knowledge as a starting point, fixes it on a projected conclusion, and then determines the degree of probability from several sets of assumptions. The result would be the *corpus* of knowledge of the decision-maker. The psychological issues of decision-makers are the starting premises (observable knowledge), as decision-makers choose them. Consequently, observation is a key psychological variable in *A Treatise on Probability*. When considering observation, identifying observable knowledge as true knowledge is a controversial subject because doing so would demand that (1) there is no misinterpretation, (2) the decision-maker understands every single observable premise, (3) and premises do not change (Cardim de Carvalho, 1988). Changeable premises, unobservable premises, and different interpretations of premises are not part of the decision-making highlighted by Keynes (1921). Hence, cognition is not part of the psychological perspective of Keynes (1921).

In addition, the similarity between observable and true knowledge is vague in the distinction between observable and complete knowledge. If knowledge is incomplete, the decision-maker needs to imagine what additional premises are necessary, what missing parts of a premise are, what the additional outcomes are, and what missing parts of outcomes are. In other words, the decision-maker would complete the premises and outcomes using her or his imagination. Some of these imaginary premises and outcomes may prove themselves true, but others may not (see Cardim de Carvalho, 1988). Without considering imagination, missing or incomplete observable premises would make decision-making in a sequential process impossible. However, Keynes (1921) does not take this into account, as he does not consider imagination as part of the psychological content of *A Treasure on Probability*.

To summarize, in *A Treatise on Probability*, Keynes’s first approach to decision-making, observation plays a key role because through observation, a decision-maker can achieve what Keynes (1921) calls true knowledge. This observation is based on a personal perspective because the decision-maker chooses what is observed. However, it would be incorrect to suggest that Keynes’s first approach to decision-making is based strongly on a decision-maker’s mindset. Because mindset relies on the cognition of decision-makers, Keynes (1921) does not account for different actors being able to interpret premises in different ways. In addition, probability is a logic that is unrelated to the decision-maker’s personal reasoning. The decision-making psychology in *A Treatise on Probability* is based on observation but it lacks psychological issues associated with cognition and imagination. The latter is central to decision-making under incomplete knowledge (premises). Imagination and cognition seem to be the missing psychological elements in Keynes (1921).

Keynes’s second approach to decision-making—the one introduced in *The General Theory of Employment, Interest, and Money*—abandons probabilistic logic – as stated by *A Treatise on Probability* – as a key subject, although observation remains a central psychological issue. In addition, cognition and imagination arise in the analysis. In the logic introduced by *The General Theory*, the future is unknowable, as some elements of decision-making can be unknown and others can be unknowable during the decision-making process (Dequech, 1999). However, the future is not unimaginable (Dixon, 1986). 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; Dequech, 2012). The key issue is that the decision-maker is not alone. She or he may be unable to know the consequences of her or his own decisions, but can imagine the results of the decision-making by observing the consequences associated with the choices of others. Furthermore, the decision-maker not only observes but also interprets the consequences. What is still missing is imagined. This

decision-making scenario is analyzed by Keynes and by Post-Keynesians, taking into consideration uncertainty and the role played by conventions.

For Dequech (1999, pp. 415–6), 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. For Keynes, uncertainty is not the opposite of the probabilistic logic of *A Treatise on Probability*; rather, uncertainty means that the logic of *A Treatise on Probability* is not applicable. However, uncertainty does not suggest a fully random process.⁴ In an uncertain environment, Keynesian decision-making is related to confidence, expectations, and conventions. The Keynesian approach to conventions and their relation to an uncertain decision-making environment are explored in this section and Section 3. Confidence and expectations are addressed in Section 4.

Taking into account Keynes’s definition of convention, Dequech (2011) stresses that Keynes does not clearly define the concept of convention with which he worked. Consequently, there are several interpretations of this concept. For instance, Darity and Horn (1993) consider Keynes’s convention as a rule of thumb. Another commonplace interpretation by mainly conventional economists is that Keynes’s convention is average opinion. Lawson (1991) refutes Darity and Horn’s argument, and Dequech (2011) contests the average opinion perspective. For Lawson, the rule of thumb is applicable only to a particular decision-maker; it exists only in an individual’s logic, which differs from the observable behavior of others. Dequech affirms that average opinion can be the outcome of several different opinions and behavior unlike that resulting from the collective-like behavior of convention.

According to Dequech (2012), a convention is a socially shared pattern of behavior and/or thought that is followed, or expected to be followed, by decision-makers, at least partly. External pressure is not mandatory. It does not exist for several conventions, and may be only partially present for others. The Keynesian convention is not only a behavioral rule; it is also a way of behaving (Dequech, 2003). Instead of offering another Keynesian concept of convention, Latsis et al. (2010) address general features of the Keynesian convention: (1) it involves coordination among agents, (2) it involves regularities in behavior, (3) it is arbitrary, and (4) it is a response to uncertainty. Highlighting the importance of conventions when making decisions in an uncertain environment, Garner (1982) states that, according to Keynes, decision-makers deal with uncertainty by assuming that the present is an adequate guide for the future, the existing state of opinion summarizes the future scenario, and conformity in the behavior of the majority (see also Keynes, 1937). Keynes (1936) affirms that a convention implies that a decision-maker who considers convention in her or his decision-making process also considers that the existing state of affairs will continue, except if there are specific reasons to expect change.

In analyses of the concept of convention in Keynes’s approach, his beauty contest example is mentioned regularly. To address the role of observation and cognition in Keynes’s notion of convention, it would be illustrative to refer to this example. As Keynes states (1936, p. 156),

“...newspaper competitions in which the competitors have to pick the six prettiest 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.”

The aim of the beauty contest illustration is to identify who will be judged as the candidates with the prettiest faces. Accordingly, a decision-maker should take into account who others would think have the most beautiful faces. The opinion of the decision-maker does not matter. Decision-maker’s perception of the perceptions of others is the central issue. “Keynes’s beauty contest” exemplifies a feature of his approach to convention; it is more about conventional judgment than a convention *ipsis litteris* (Bibow et al., 2003). Conventional judgment implies that decision-makers assume others may be better informed than they are (Keynes, 1937; Dequech, 2003).⁵ From a conventional judgment

⁴ The notion of Keynesian uncertainty has been highly debated and documented. This study does not repeat published contributions, which include Davidson (1983), Cardim de Carvalho (1988), Lawson (1988), Palley (1993), and Dequech, (2003), Dequech, (2011).

⁵ In Keynes’s words: (Keynes, 1937: 214): “[k]nowing that our own individual judgment is worthless, we endeavor to fall back on the judgment of the rest of the world which is perhaps better informed. That is, we endeavor to conform with the behavior of the majority or the average. The psychology of a society of individuals each of whom is endeavoring to copy the others leads to what we may strictly term a conventional judgment”

perspective, the key subject is interpretation of what others think. According to Keynes, this interpretation takes the form of anticipation. Considering Keynes's example, to win the prize, the central issue is to consider what others comprehend and decide accordingly. A misinterpretation implies being out of the competition. Consequently, cognition is an important psychological variable in Keynes's concept of convention and consequently in his decision-making approach, as stated in *The General Theory*.

Summing up, In Keynes's second approach to decision-making, the observation of conventions is based on the observation of the behavior of others.⁶ Imagination is associated with Keynes's concept of convention because it demands that decision-makers have capacity to imagine themselves in place of the observed in order to achieve similar results. Cognition signifies the capacity to understand what conventions mean and how they can be taken into consideration by decision-makers. For further development of the place of observation, imagination, and cognition in Keynes's approach to decision-making, Bandura's and Festinger's studies must be considered.

3. Enter psychology

As observation was identified as the common psychological variable placed on both of Keynes's approaches to decision-making, Albert Bandura's vicarious learning was chosen as a psychological guideline to discuss Keynes's perspective on decision-making. This is because observation is central in Bandura's theory. According to vicarious learning theory, decisions are the result of the creation of knowledge from the perspective of the decision-maker as someone who observes and interprets what occurs around her or him. By observing others, people create knowledge about decisions and behavior and learn how to decide and behave (Bandura, 1971, 1986). Knowledge, vicariously created, is used as the basis of future observations, consequent decisions and behavior, and their reinforcement, adaptation, or change. A personal background to decision-making is generated and reviewed vicariously. Bandura (1971) highlights that virtually all learning phenomena result from direct experience, but a living situation or physical interaction among people is not required for a decision-maker to gain knowledge. Learning can occur on a vicarious basis through the observation of the decisions and behavior of others and their consequences for others (Bandura, 1971, 1986).

A key point regarding vicarious learning is that if something is learned vicariously, someone is recognized as a model of decisions and behavior. By observing a model, a person can avoid mistakes when unknown or unfamiliar decisions have to be made and behaviors have to be chosen. In Keynes's first approach to decision-making, premises are the observable subjects. In Keynes's second approach, decisions of others are the targets of observation. Considering the former approach, it is possible to find a mismatch with the vicarious learning perspective. By arguing that probability is a type of logic unrelated to the decision-maker—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. The reason is that in vicarious learning theory, the logic that associates premises with outcomes is learned socially and vicariously. In addition, if by observing others a decision-maker learns which decisions or behaviors generate desirable outcomes, then outcomes are observable. In *A Treatise on Probability*, outcomes are not necessarily observable because if premises and logic are both available, the outcome will occur independent of observation. To make a connection between Keynes (1921) and vicarious learning, we must allow that logic and outcomes are not only observable but also can be learned by observation. As a result, the vicarious learning perspective does not fit with decision-making in *A Treatise on Probability*. The same does not hold for Keynes's second approach to decision-making.

For vicarious learning to be possible, two decision-makers are necessary: the observer and the model. Otherwise, vicarious learning is meaningless. The observer watches decisions and behavior—or gives attributes to them—in the model. In “Keynes's beauty contest,” newspaper readers play the role of observer and the participants the role of model.⁵ Note that a newspaper reader, as described by Keynes (1936), is not an observer *ipsis litteris* because a person can read a newspaper alone in a room without observing anyone. By affirming that, in Keynes's beauty contest example, the newspaper reader plays the role of the observer, this concept of the observer follows Bandura's theory. In

⁶ Next item, Section 3, will address some features to what this paper means by observation in *The General Theory*. However, to avoid possible conceptual misunderstanding, it is important to address that the observation of others' behavior can be based on what others might believe. In Keynes (1936), the key decision-making issue is not observing the behaviors of other *per se*. Nevertheless, how the decision-maker would imagine others' behavior and how those actions could affect what the decision-maker understood as they can support her/his own behavior. Observation can be present or absent in the process of building a belief, but its presence is not mandatory.

a vicarious learning situation, the subsequent decision and behavior of the observer become more similar to those of the observed, or allegedly observed, decisions and behavior of the model (Flanders, 1968). In Keynes's example, the decision and behavior of the observer would be the choice of what she/he thinks others think characterizes a beautiful face. Following vicarious learning logic, observers recognize the decisions and behavior of, what she/e understood as, a model as a source of how to decide and behave in a desirable way.

The procedure by which observers identify models, learn to believe in what desirable decisions or behavior are, and what they mean relies on the cognitive abilities of decision-makers. Learning, even if vicariously, cannot take place without awareness of what the model is and what is being reinforced, such as the meaning of beauty and which are the more beautiful faces among a group of photos in the beauty contest example. Comprehension occurs through cognitive abilities. Awareness and cognitive abilities are the results of decisions and actions of individuals who decide and behave according to their understanding of chains of associations developed and conditioned by previous information and their imagined/expected answers (Bandura, 1971, 1986). To be aware of what was learned means that people can theorize about how to decide and behave. Hence, cognition implies building and categorization, which are based on some form of selection and interpretation of decisions and behavior (Neisser, 1976; Fernández-Huerta, 2008). According to Bandura (1986), knowledge of concepts is also a matter of vicarious learning.

For Bandura (1986), through observing the choices and performance of others, a decision-maker acquires not only patterns of decision and behavior but also a cognitive framework about what some decisions and behavior means. For example, the notion of beauty comes from what the decision-maker understood as other people demonstrate about it. Consequently, models can cognitively interfere in the decision and behavior of people, and symbolic representations—such as that of beauty—can be used later by decision-makers to guide their decisions and behavior. The central role of cognitive abilities in vicarious learning is the interpretation of symbols by decision-makers, according to which decisions and behavior imply what they understand to be desirable results. Consequently, the decision-maker cognitive framework is central for her/him build beliefs.

However, in some situations, the observer is unable to comprehend the relevant attributes, related decisions, or behavior involved in a desirable result. When such a situation occurs, there is cognitive dissonance, which is an inconsistency between what is understood from the model and what is comprehended to be a desirable result (Festinger, 1957). In this scenario, the decision-maker is unable to build a belief about what desirable decisions or behaviors are. According to Festinger (1957), when decision-makers are able to perceive that they are in a state of cognitive dissonance, they try to make it stop because what is understood to be the desirable result cannot be achieved. The attempt to avoid cognitive dissonance usually occurs by replacing the decision–result relationship, which comes from observing other potential models.

The classical example of cognitive dissonance is Festinger's (1957) smoker. A smoker who has learned that the eventual result of smoking is ill health is in a state of cognitive dissonance. Hence, to understand this result as desirable is no longer possible. There are two possibilities for the occurrence of new cognitive consonance: (1) the smoker modifies her or his behavior because new information about the behavior shows the negative effects of smoking, and consequently, the smoker may quit or try to quit smoking; and (2) there is a reinforcement of smoking behavior, where the changed focus is on the good effects of smoking (Festinger, 1957). Festinger's smoker example has parallels with Keynes's beauty contest, in which decision-makers interpret the concept of beauty or any other conceptualization or symbolism implied in decision-making. When decision-makers perceive that their notions of what concepts mean no longer imply desirable results, cognitive dissonance occurs.

In a cognitive dissonance situation, if there is a change in decision-making, modification is not automatic, and neither is the perception of information that reinforces previous decisions (as in the case of the smoker who changes her or his focus to good information about smoking). In both cases, cognitive dissonance will be eliminated. However, as Festinger's example illustrates, it is impossible to confirm that the perception of demeaning information about the responses will modify the decision-making process. Rather, the interpretation of the decision-making result can be what changes. This, then, is another reason it is impossible for Keynes's first approach to decision-making to be compatible with the vicarious learning perspective. Considering cognition, the meaning of a premise to a decision-maker can change and does not match the decision-making environment of Keynes (1921). On the other hand, the decision-making approach in *The General Theory* means decision-makers vicariously learn, but what is learned does not determine the decision-making. This non-determination is associated with two key issues: (1) a decision-maker is in a never-ending vicarious perceiving and learning process, and hence, new models and cognitive issues are learned;

and (2) what is learned is just a guide to decision and behavior, while the decision-making environment is a supposition created based on the decisions and behavior of others.

Considering Keynes's second approach to decision-making, following conventional decision or behavior is based primarily on cognitive consonance. Conventional judgment exists because decision-makers are able to relate desirable results cognitively to some socially established decision-making procedures. Participants choose to enter a beauty contest, as suggested by Keynes, if they think that they are able to comprehend the collective cognitive consonance of the concept of beauty. In addition, a vicarious learning perspective of Keynes's second approach to decision-making offers the possibility of discussing the importance of socialization in Keynes's notion of convention. Keynes stresses its significance by dealing with the state of affairs and state of opinions in his concept of convention or conventional judgment. Sociability plays a key role by introducing decision-makers to the identification of the state of affairs and the state of opinions in a group, such as the meaning of beauty. Socialization processes imply the existence of social groups. Groups emphasize a set of cognitive consonance that suggests what the models of decision-makers are. Within a group, cognitive consonance can be stronger because the group generates a snowball effect on models. Snowballs take place when decision-makers are motivated to follow the decisions or behavior of others by their recognition and reinforcement in several different models.

When a group is observed, the relationship established is between observers and several models. In addition, observers try to decide and behave as models do; if they succeed, they become models themselves. This procedure generates a self-supporting snowball effect and, consequently, models are highlighted and legitimized by the group. Groups imply socially highlighted decisions and behaviors that are conventional and socially highlighted.

Thus far, the vicarious learning approach of Keynes's perspective on decision-making stresses decisions associated with conventions. A vicarious learning reading of the decision-making perspective in *The General Theory* allows a theoretical connection to other examples of decision-making analyzed by Keynes, such as crucial choices and animal spirit, which are deviations from conventions.⁷ To follow a convention is to project the current situation into the future; hence, a deviation from a convention occurs when the decision-maker has specific reasons to expect a change (Dequech, 2012). One kind of deviation from a convention is based on a decision-maker's spontaneous optimism. This is referred to as animal spirit by Keynes (1936).⁸ According to Dow and Dow (2011) and Dow (2011), animal spirit is a spontaneous desire to act despite uncertainty. For Keynes, animal spirit is a spontaneous wish to behave rather than not behave. For Dequech (1999), animal spirit does not follow the paths laid out by decision-makers' logic. Hence, in a spontaneously optimistic situation, what was learned vicariously plays only a minor role, if any. Additionally, Keynesians and Post-Keynesians—such as Davidson (1983), Cardim de Carvalho (1988), and Dequech (2003)—usually emphasize another key issue of decision-making, the possibility of crucial choices. Crucial choices are associated with the Keynesian approach to decision-making because it is possible that one action can change the decision-making environment in a way that did not exist before (Cardim de Carvalho 1988; Davidson, 1972, 1983). Crucial choices rely on a decision-maker's creativity (Dequech, 2003, 2012), and thus, the Schumpeterian entrepreneur is frequently cited as an example of a person making crucial decisions. From a Schumpeterian perspective, the entrepreneur is one who has the ability to promote an innovation, and in doing so, achieve extra profit. Innovation is the introduction of a good or (part of) a productive process that did not exist previously. An innovation changes the market and competitive process in a way unpredictable even by the innovative entrepreneur (see Schumpeter, 2011, especially chapter 2). According to Dequech (2003), innovative behavior is at least partly unconventional because a decision-maker rarely thinks in a completely unconventional way. In addition, it is difficult to break with all existing conventions at the same time. A Schumpeterian entrepreneur rarely innovates without following path dependency (see David, 1985; Arthur, 1994). Making a crucial choice signifies that change is expected. It involves the capacity to imagine the future differently from the present.

Briefly, decision-makers establish expectations that are forecasts or images of the future (Dequech, 2012). These projections and pictures of the future can be based on conventions or creativity. However, a decision-making framework is not strictly conventional or creative. They are all present on some level and usually in widely varying levels. Nevertheless, conventional decisions and behavior play the key role because the decision-making framework needs some level of stability in order to work. Thus, conventions are necessary even from the innovative perspective. Davidson

⁷ Crucial choice is not a type of decision-making analyzed by Keynes. It relies on a Post Keynesian reading of Keynes. Post Keynesian – such as Cardim de Carvalho (1988) and Davidson (1983) – carries this concept from Shackle (1955) to studies inspired by Keynes

⁸ However, animal spirit differs from irrational behavior. For further details, see Dow and Dow (2011).

(1983) introduces this discussion in a complementary way. He highlights that the decision-making environment changes through historical time, and is influenced by it. History means that previous vicarious learning in a society supports current decision-making—the decision-maker is in a non-ergodic world. Vicarious learning and social support do not signify replicability. Models and cognitive consonance support the logic of decision-making but do not determine choices and behavior. People learn logic and how to apply it in their decision-making method, which differs from determinism (an ergodic world). There is a dynamic process that includes creativity and spontaneous optimism. Section 4 emphasizes why some logic and decisions are emphasized more than others are in this dynamic process.

4. Reinforcement, confidence, and the weight of arguments

The shift from Keynes's approach to decision-making in *A Treatise on Probability* to that in *The General Theory* relies on a transposition from probabilistic logic—an external logic—to a logic internal to decision-makers and the decision-maker's perception that reality is socially built. Because of this change, Keynes's decision-making moves closer to psychology. A dichotomy between external and internal logic had arisen for the first time before the publication of *The General Theory*, occurring during the time Keynes wrote *A Treatise on Probability*, as it was present in the discussion of the weight of arguments (Cardim de Carvalho, 1988 and Runde, 1990). In *A Treatise on Probability*, new evidence about premises already known by the decision-maker does not reveal any new logical link between premises and outcomes, nor does it deny any link. It merely repeats an already-known argument. Under these conditions, this new evidence may not change a probability, but it alters its “degree of belief,” because if the premises are true knowledge and their manipulation is logical, then the weight of an argument is irrelevant. Despite that fact, Keynes (1921) introduces the “degree of belief” of a decision-maker in logic because of repeated information. For Cardim de Carvalho (1988), this issue is not highlighted in *A Treatise on Probability* because Keynes deals with the weight of arguments in isolation from the rest of his analysis. However, this discussion is developed later in *The General Theory* in the debate about states of confidence.⁹

The similarity between the weight of arguments and state of confidence is not entirely clear among Keynesians and Post-Keynesians. Some researchers take the similarity into account, such as Cardim de Carvalho (1988) and Darity and Horn (1993). However, others—like Runde (1990) and Dequech (1999)—do not necessarily consider the concepts as similar. For Dequech (1999), this difference is because the weight of an argument is an issue about how uncertainty is perceived, and confidence depends on aversion to uncertainty. Despite introducing a difference in conceptualization, Dequech (1999) offers a way to link the weight of arguments to states of 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 denotes 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 ignorance. For Runde (1990), these definitions are not fully consistent and are subject to interpretation. Fontana and Gerrard (2004) point out that making decisions under uncertainty depends on assessing not only the relative degrees of belief attached to alternative behavior but also the absolute extent of the evidential base relating to the whole set of alternative results. This evidential base can be understood as both the weight of arguments and state of confidence. For a discussion of the psychological content of Keynes's approach to decision-making, which takes cognition into account, the key role is played by the way in which the environment is perceived by decision-makers. If interpretation is the highlighted issue, then the weight of arguments can be understood to be state of confidence.

In this study, the weight of arguments and state of confidence are connected to psychological support through the reinforcement of psychological variables. Reinforcement stresses the degree to which decisions and behavior are highlighted in a decision-making environment and is directly connected to the perception of the expressivity of some decisions by and behavior of decision-makers. In a vicarious learning decision-making environment, the relationship between an observer and a model has informative and reinforcing functions (Bandura, 1971, 1986). The former takes place by recognizing a decision or behavior of a model as desirable. The latter occurs as the decision and behavior

⁹ It is also possible to find this discussion associated with the degree of reliability. Vercelli (1991) highlights this approach, where the weight of the argument is associated with the degree of reliability of the probability. Following this logic, a decision-maker would attribute to each probability relation a given degree of reliability, which will then influence the decision-maker's choice. In order to analyze decision-making, a key issue is how the degree of reliability is established. The answer in Keynes (1921) would implicate repeated information; hence, Cardim de Carvalho (1988) is still valid.

of a model are supporting elements of the observer's decisions and behavior. Relationships among observers and models have different intensities; the level of a relationship's reinforcement determines whether it is weak or strong (Bandura et al., 1963; Bandura and Mischel, 1965; Bandura, 1971). When the observer perceives strong reinforcement, a strong relationship is formed, which implies high confidence in the desirability of such decisions and behavior. The relationship is weak when reinforcement is feeble, which suggests low confidence in the possible achievements of the decisions and behavior. There are three main different types of reinforcement: (1) vicarious reinforcement, (2) cognitive reinforcement, and (3) self-reinforcement (Bandura, 1986). The first is the effect of observing models and their decision-making or behavioral consequences after the establishment of relationships. Vicarious reinforcement reaffirms the decisions and behavior of observers through continuous observation of the decisions and behavior of models (Flanders, 1968; Bandura, 1971). In addition, the decisions and behavior of observers vicariously reinforce the models 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 that can be cognitively reinforced. As a result, reinforcement can be both vicarious and cognitive. According to Festinger (1957), decision-makers feel pressure to produce consonant relationships among meanings and behavior to avoid dissonance. This pressure relies on social learning. In societies, there are socially built paths of meanings, decisions, and behaviors that decision-makers can adopt to interpret behavior and generate relationships with models. Through collective comprehension, cognitive dissonance is usually reduced. Festinger (1957) highlights that culture or group standards can determine what is appropriate in a cognitive sense. In Earl and Wicklund's (1999) explanation, a decision-maker can achieve consistency in her or his cognitive abilities by taking the path that is more resistant to change. Conventions are the parallel to this in Keynes's theory. From this perspective, conventional behavior is directly associated with a perception of a state of confidence in the decision-making environment.

Given a decision or behavior that is already understood and reinforced, it is highly likely that such a decision or behavior will occur again when the decision-maker faces the same or a similar context. Repetition occurs when decision-makers have observed the model several times, which occurs not only as a result of the snowball effect but also through the perception of the same or similar scenarios in which a learned decision or behavior created a desirable result. In addition, repetition strongly relies on cognitive consonance and the ability of the decision-maker to theorize about what has been learned vicariously. As a consequence of vicarious learning, repetition is based on frequently observing a model; by this logic, repetitive decisions and behavior expressed by models are continually and powerfully reinforced, culminating in self-reinforcement. Self-reinforcement takes place when decision-makers decide and behave based on decisions and behavior that have previously been learned vicariously. Self-reinforcement occurs when what was learned vicariously becomes an inner part of the decision-making process.

Repetition, which culminates in self-reinforcement, does not need an ergodic world in order to take place. A decision-maker can use the knowledge acquired through vicarious learning in similar situations. Knowledge can be adapted, and consequently, can be useful in a non-ergodic environment. Through the development of societies, models spread, consequently becoming integral to the decisions and behavior of those able to decide and behave accordingly. From a vicarious learning perspective, decision-makers are able to perceive and comprehend which models are compatible with which decisions. Observation still occurs, but decision-makers have already internalized models and cognitive consonance. Hence, observation is not strictly necessary for a decision. However, vicarious learning continues to occur.¹⁰ When a decision or behavior is self-reinforced, it is associated with an interpretation of a high state of confidence.

5. Final comments

It has become commonplace to reclaim psychological content for economic decision-making studies based on behavioral economics. This study outlined a different proposition, namely, to connect the psychological content of Keynes's decision-making approach with psychological studies that consider psychological content. In doing so, this

¹⁰ Other branches of economic science use specific terminologies for retained vicarious knowledge that is known by decision-makers. Thorstein Veblen, in his institutionalist theory, refers to it as "institutional furniture" (Veblen, 1899). Social economy usually uses the same practices (see Dolfma, 2009).

study highlighted the place of vicarious learning and cognitive dissonance theory in Keynes's approach to decision-making. Initially, it was argued that the psychological content of *A Treatise on Probability* was incomplete because it regarded only observation as a central psychological element, while its analytical perspective demanded roles for imagination and cognition. The substitution of probabilistic logic for decision-making embedded in uncertainty, which occurred in *The General Theory*, led Keynes to consider imagination and cognition in the psychology of his decision-making approach.

Despite the presence of the observation variable, the content of vicarious learning theory is not compatible with the psychological perspective offered in *A Treatise on Probability*. Such compatibility requires that the outcomes resulting from premises are observable. Furthermore, a cognitive perspective implies that the meanings of premises can change. This possibility addresses a decision-making environment different from the one drawn by Keynes (1921). From the current analysis, it was 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*, which could be understood to offer a more coherent and complete psychological perspective than *A Treatise on Probability*.

Vicarious learning and cognitive consonance beautifully fit Keynes's perspective on decision-making emphasized in *The General Theory*. Vicarious learning offers a decision-making plus behavioral perspective, and cognitive consonance offers a cognitive standpoint for the place of conventions in decision-making. However, vicarious learning does not offer a theoretical connection only to the place of convention in decision-making. From a psychological perspective, weight of arguments and state of confidence can be understood as the same. Furthermore, the weight of arguments is connected to reinforcement of what can be vicariously learned in a decision-making environment. The level of reinforcement determines the strength of the link between an observer and model. When this relationship is strong, there is an interpretation that the decision-making environment holds a state of confidence. This reinforcement can occur in three different but not mutually exclusive ways: (1) vicarious reinforcement, (2) cognitive reinforcement, and (3) self-reinforcement.

This study did not exhaust the discussion about the psychology of Keynes's approach to decision-making. On the contrary, it highlighted a psychological perspective of some elements of Keynes's decision-making. Studies constructed on other psychological perspectives and analysis of other elements would enrich research on Keynes's psychologically based decision-making.

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