Perspectives on learning and economy

Reflections on the concept of learning in economic theory

Brian Kjær Andreasen
M.Sc. (Soc.Sc.), Ph.D. Student.
Aalborg University
Centre for the Interdisciplinary
Study of Learning
Fredrik Bajersvej 7B
bka@vcl.auc.dk

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Abstract:
This article is an attempt to refine the theoretical discussion of the concept of learning in economic models. The article introduces a series of critical reflections on the way in which the concept of learning traditionally has been applied in modern economic theory. Alternatively, elements of the classical learning theory are outlined as potential supplements in the development of economic models that operate with learning and understanding.

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THE CONCEPT OF LEARNING IN ECONOMY

This article must be viewed as a reflection on the understanding, the application and the applicability of the concept of learning in modern economic theory. Compared to other areas within the arts and social sciences the quantity of literature, which is explicitly about learning in the subject of economy, is fairly limited. Furthermore, the majority of scientific contributions within this area are highly theoretical in nature. However, it should be emphasised that it is not the intention of this article to rectify this. The intention is rather an attempt to refine the theoretical discussion by approaching the concept of learning from a more cross-disciplinary angle.

No economist would claim that learning is irrelevant. This is especially true if economy is to be perceived as a social science that deals with human behaviour and societal development. Nevertheless, changes in behaviour in economics have traditionally been considered to be "black box" problematics, and it is only within recent years that economists have paid attention to learning as an important explanation of change in human behaviour, mainly spurred by models of rational expectations and the theoretical development in game theory.

The recognition of the concept of learning, which has taken place within other fields of science that deal with human behaviour (e.g. sociology, social psychology, psychology and pedagogy) has only quite late been admitted in the construction of economic theories. In these theories learning has to some extent only been recognised as one of the human characteristics, which are necessary to understand in the study of human dispositions[1].

To outsiders (that is non-economists) it may appear remarkable that processes, which in other connections and within other areas of the arts and social sciences are ascribed so much explanatory significance only now have been subject to systematic analysis. The explanation to this factor is presumably to be found in the implicit assumption of perfect adaptation in economics. This is an assumption which has dominated construction of economic theories for a long time, and if the concept of learning has been applied at all within the frames of this, it has been in form of axiomatic propositions or ad hoc assumptions about human interplay (Slembeck, 1998. p.2).

In economics learning is regarded as a passive or unresisting adaptation within which the actors almost instinctively act on the changes in their surroundings (Slembeck, 1998. p.2). It is also assumed implicitly in this adaptive perception of learning that learning is both perfect and complete. Perfect in the sense that what is learned is *always* in agreement with reality, and complete because the actor is assumed to be able to learn what is necessary (or optimal) within the given circumstances.

"Generally speaking, standard economics has treated human learning as a black box process of perfect adaptation and has not attempted to explore either the conditions under which this may be justified, or the limits that are implied by the learning assumptions." (Slembeck, 1998. p.5.)

[1] MacFadden (1998. p.3) emphasises that where e.g. the psychologists primary objective is to understand the processes and elements, which form part of the decision-making process, how these are formed and changed through experience and how they determine values, the primary objective for economists is on the other hand rather a question of mapping the connection between input and choice. The elements of the actual decision-making process are the primary objective for the psychologist but the economist regards this as a "black box". McFadden considers in this article whether it is this lack of attention to the decision-making *process* - rather than the results of this process, which is the problem for the economists.

Rather than perceiving learning as an active trait of human behaviour, the learning of the economic actors appears as mechanisms, which passively accumulate information in a continuing adaptation of environmentally relevant data. This presentation of human learning serves a simplifying purpose. Highly complicated mechanisms are simplified with a view to making predictions on aggregated levels. It is, however, my firm belief and the basis of this article that such a perception of learning can be justified neither by means of common sense nor based on a wish for prediction. It must be maintained that models wishing to reflect reality must necessarily be solidly anchored in real conditions.

My arguments against the passive and adaptive perception of learning in economics can be recapitulated in the way in which I perceive learning:

1. I see actors as active *creators of meaning* in a continuing learning process.
2. I see learning as being *more* than just the mechanical adaptation of (relevant) information.
3. I see learning as an *active* individual and social process, which takes place in the interplay between the actor and his surroundings.
4. I see learning as interplay between both cognition and emotions.

In the following paragraphs I will discuss the rational economic concept of learning in relation to these assumptions of the nature of learning.

AN OPERATIONALISATION OF THE CONCEPT OF LEARNING

When economic actors learn it is often in the anticipation of obtaining certain objectives. The sole purpose of learning is to maximise or optimise an economic pay-off. If the pay-off is less than optimal the previous learning must presumably be the same. Likewise, a latent assumption seems to be that learning is reflected directly in action. Thus, when an actor learns he will co-ordinate his actions according to this learning. In cases where actions do not correspond to the expected learning, a paradox will arise and these anomalies are especially numerous in the economic game theory.

When anomalies and paradoxes arises, it is my opinion that it is caused by the fact that the researchers operate with an understanding of learning, which at best is too simple and at worst outright erroneous. The economic individual is not, as prescribe by the models, an adaptive machine, which will use any piece of available information in its perpetual search for a large pay-off.

Among most modern theories on learning consensus prevails in the perception of learning as a result of a series of mental constructions. Learning is seen as a psychological-social process of change in which the specific weighting between the psychological or the social can vary somewhat dependent on one's preferred theoretical disposition.

My personal position between these different approaches to the concept is that learning fundamentally seen is an individual process, in which the learning individual through communication and interaction with the surroundings subjects himself to new input. Learning is thus a mental process for the individual actor, through which he or she must appear as an *active*

processor of information. All learning is an expression of *individual* change that occurs within the framework of specific *social* constructions. Thus, learning is inseparably bound up with the individual - as an individual and not collective process, but it is nevertheless influenced by a series of external factors such as e.g. group and interpersonal relations. It is, after all, in the interaction with other people that we (orally or otherwise) organise and reorganise our perceptions of the world and our knowledge of it. Learning is then in this sense a social as much as an individual phenomenon. In fact individual learning may be perceived as the *result* of social processes in our interaction with others.

Within this perception of the concept of learning the central focus will thus be the understanding of learning environments/learning situations, which will engage the learning individual in constructions of understanding. It is, however, not my opinion that the study of the situational elements of learning will solve economics's "black box" problem, but I am nevertheless convinced that a more extensive use of situational learning variable (based on hypotheses on the interplay between these) will increase the possibilities of more complex (and realistic) economic models. In the following paragraphs I will tentatively present a series of variable, which I think need to be reflected on in the construction of an economic model for actors learning.

Situational dependency: As it appears from the previous paragraphs, human cognition involves a certain interaction with the surroundings and/or other actors. Learning is thus to some extent tied to the context in which it takes place. It does, however, seem relevant to distinguish between at least two different forms of situational variable; the variable which exist independent of the actor and his interaction with his surroundings, and the variable which may be the result of the actors interplay with the surroundings (Slembeck, 1997, p.16-17). The influence that the situation has on the actor is of course also relative. At times situational factors will exert a strong influence on learning and behaviour while personal factors at other times will be stronger than the situational ties which exist in surroundings. The actor is neither driven by inner preferences nor situational circumstances exclusively. Learning is best explained in the mutual interaction between personal and situational determinants - in the continuous interplay between the actor and his surroundings.

The actor's existing knowledge and experience: The actor's previous experiences, history and preferences must also be included as situational dependent variables in the economic learning model. Bordieu (Bordieu and Wacquant, p.109) writes e.g. about the human mentality that:

"Human action is not a sudden reaction on stimuli from without. Even the smallest reaction from one person to another holds in itself the entire history of both persons and their mutual relationship."

Situational complexity: Furthermore, it is relevant to distinguish between different degrees/levels of situational complexity. The situation in which the individual actor is to make his choice and learn from is characterised by being more or less complex. In this case I assume that the complexity of the situation is connected with the learning, as it is to be expected that a complex situation demands considerably more resources to understand and learn from than a less complex situation.

Situational information: One aspect of the situational complexity, which should be carefully specified in a model, is the nature of the information that the involved actors receive, already possess or procure about the situation. One could assume, as e.g. Slembeck does in his article about this subject (Slembeck, 1997 p.18), that learning becomes easier the more information is accessible

to the actor. I do, however, find that such an assumption is criticizable based on the viewpoint that information and learning cannot easily be equalled. Contrary to Slembeck I do not believe that the surroundings by themselves determine the quantity of learning or for that matter the easiness of the learning. The view of the actors in Slembeck's model assumes implicitly that all learning actors are alike and that the only determinants of learning are thus external in relation to the actors. To keep the record straight I must declare myself in disagreement with this assumption, since it reduces the individual to a passive respondent in relation to the surroundings, which may influence him or her.

Actor variables: The individual actor's cognitive capability is also a variable, which should be considered carefully in the economic model. If the objective of the economic model is a minimum of realism, it could be perceived as a problematic feature to operate with unlimited rationality and ditto cognitive capability concerning the individual actor. Alternatively, many economic models often operate with limited forms of rationality. Models of limited rationality are not new in economic thinking. The most well-known model may be Herbert Simons' model of "Bounded Rationality", which based on the cognitive psychology demonstrates that human beings are not capable of living up to the stringent assumptions of full rationality in economics. Nevertheless, we *aim to* make rational choices and the rationality must thus at best be characterised as restricted or "bounded".[2] [3]

The nature of learning: One of the most important shortcomings of most economic models, which in one way or another deals with learning, is the latent assumption of an unambiguously positive learning. Learning, skills and abilities are in all situations assumed to be positive characteristics to the individual actor. Learning is by definition something positive - the more learning the better off is the actor in his situation. I will relate critically to this assumption based on a series of simple premises of the subtle nature of learning. Learning is the process through which one finds out *what* one wants to learn - and then learn exactly that. Learning is thus, when one finds out what type of knowledge one needs, even when one is not aware of its existence. In addition to this learning is also deconstruction of learning; one deconstructs the structures of knowledge which are no longer needed, counter-learning; one experiences blockages to learning, inclusive learning; one learns more than what is immediately presented and erroneous learning; when learning is incorrect. The horizon of learning is very wide and subtle - learning is therefore not only the positive acquisition of useful information but also a change in the learning individual, which dependent on the context can be regarded positive as well as negative.

Emotional dispositions and affect: The emotions' importance to human thinking and human action is only surpassed by the scanty attention and value that they have been ascribe by so many sociologist (Elster, 1989, p. 61). Where the arts and social sciences predominantly have focused on the affective aspects of the human being, the economic sciences have to a great extent viewed cognitive reasoning as the dominating ingredient in human thinking. In economics emotions are not perceived as mental operations providing us with credible indicators of objective states. Emotions

[2] In Simon's terminology the term sitisfizing is used instead of optimizing.

[3] That human beings do not always act cognitively optimal is e.g. illustrated in the game theoretical abstraction The Chain Store Paradox. The Chain Store Paradox illustrates the difference between on one hand actions that on a formal-logical and matematical level are optimal and on the other hand (and presumably in the light hereof) irrational human behaviour. The paradox thus departs from the idea of the "pure" rationality and in stead it introduces the "limited rationality".

and affect are likened to irrationality. Virtually, the actual concept "rational" indicates cognitive reasoning which is indifferent to the accidental, transient and unstable character of affect.

I do, however, dare to postulate that emotions in most situations play the same roll as cognition in our decision-making processes; as a basis for decisions on e.g. economic action.

All understanding, everyday understanding as well as scientific understanding, involves construction and reconstruction. When we as human beings can have such different understandings of even simple objects or events, it is due to the fact that several different personal interests, motives, dispositions, etc. are part of this process as well. It is, in short, these constructions and the nature of them, which make us thinking beings and ultimately decide the extent of our present and potential understanding. They are, if you like, the "blue prints" of the understanding; the basic principals according to which the understanding is organised. Constructions do, however, not only occur on a cognitive level. The organisation of our experiences is as much a result of our emotional dispositions as it is a result of cognitive abilities.

Before the economic actor can learn anything an emotional frustration must exist, which is not suppressed, differentiated, transgressed, disparaged or otherwise emotionally handled. Thus, the actor's learning does not rest in the isolated construction but in the (cognitive and affective) relations that structures may have with each other. A cognitive action can never be affectively neutral. Even in the most abstract mental operations an element of affect always exist, which acts motivating or de-motivating in relation to the cognitive constructions. This is one of the functions of affect in the actor's learning.

The other function of affect in relation to the economic actor is more direct. Affect forms similar to cognition the basis of decisions and understandings, but in this process it is a less resource-demanding basis for decision-making than cognition. In this heuristic function affect saves us time and resources as it:

A. States the object of our cognitive activities. In other words, emotions decide which aspects will appear to us as problematic and which we can live with. In this way emotions motivate our focus in some sort of heuristic identification or sorting mechanism.

B. Functions in an evaluative manner in relation to the possible attaining of the object; is the object of a such nature that it is worth spending resources on? Or is it even likely that the objective is attained? In this function emotions forms a pre-cognitive basis for decision-making.

The function of emotions is thus to focus our evaluative assessment; to intensify our attention to selected aspects of reality - on the expense of others. Emotions then serve two very different (but none the less coherent) purposes: They maximise the establishment of new structures of knowledge and contribute to maintaining the old ones, and they minimise the distance from the starting point to the objective. This means that they form the evaluative basis for decision-making, which focus our attention on problems we find interesting, captivating, exiting and relevant. Thereby, they save us a lot of time and thinking.

THREE CLASSICAL THEORIES ON LEARNING

Within modern economics there is today a growing empirical foundation against the assumptions of the rational model. The most recent critique comes from the Nobelist Daniel McFadden (1998),

who believes that the reason for the many anomalies in economics is its lack of attention to the process for the sake of output. Economic models may be applied on aggregated levels so they are suited for actual decisions, but if you ask real economic actors about their motives and beliefs, concerning deviations from the standard model become evident.

McFadden (1998, p.5) describes the most important characteristics of this standard model; the economic man. These characteristics are as follows:

- The model is convenient: It is directly applicable in economic empirical analyses. In this respect the models constitutes an important tool for economic analysis and policy.

- The model is successful: In different designs and with variations the model describes the most important aspects of behaviour in markets.

- The model is unnecessarily strong: A lot of the primary economic areas of analysis are quite suitable to be subjected to a critical examination on the bases of "weaker" (less restrictive) assumptions (e.g. bounded rationality).

and last but not least…

- The model is false. In a very broad sense almost all human behaviour has a rational component, but overwhelming empirical evidence exists against a literal interpretation of the economic man as a model for al human behaviour.

Consequently, the model constitutes an inadequate platform for understanding the *processes,* which form the basis of adaptation and learning. As an alternative to the economic model McFadden includes elements from the classical (psychological) decision theory - in the shape of Tversky & Kahnemann - and lets them supplement the economic model - primarily by a much more intensive focus on the decision-making process. Tversky and Kahnemann showed in a series of experiments that in reality humans do not make their decisions according to the economic model. By way of example they carried out an experiment, in which the participants had to choose between actions that most probably would ensure them a small gain and actions that less probably would ensure them a large gain. The experiment was arranged so the benefit (gain multiplied by probability) would be largest by choosing the large gain. Nonetheless, most participants chose to go for the small gain. A result which Tversky and Kahnemann interpreted as an immanent character in human beings - seeking security. McFadden uses these examples as argumentation for the inadequacy of the economic model - and at the same time as argumentation for the existence of perceptual "errors" in human action; errors that are due to the way in which information is treated in the learning process with real human beings.

It seems, thus, to be symptomatic of the economists of today, perhaps as a manifestation of methodological self-examination, to focus increasingly on the psychology's theories about learning as possible supplements to their own basic assumptions on human nature. However, I do not believe that these approaches in reality represent the *full* potential of learning theory in relation to the economic theory construction. I could imagine that it would be interesting for economists to glance at a few other classical learning theorists.

Jean Piaget's interpretation of learning as a continuous adaptive process of equilibrium could be a great source of inspiration for economists (his logic-mathematical perspective should in any case appeal to most economists). It is true that Piaget's theories often have been applied in pedagogical connections, but in recent years focus has increasingly been put on the actual foundation for his understanding of development; that is, on this adaptation theory about equilibrium through assimilation and accommodation; a theory on the forms and schematics of understanding. I will shortly outline the most important forms of understanding.

Figurative understanding is a form of understanding which is connected to forms of manifestation, to the surface and to the immediate perception. Figurative understanding denotes a statistic way of focusing on the external figural aspects of an event. The opposite of figurative understanding; the **operative understanding** is a form or understanding which is connected to the internal structure, the connection or nature of the content/essence. Operative understanding is the essential generalised structuring aspect of intelligence. Figurative understanding relates to the entirety while operative understanding relates to the elements and their structures. It is, however, important to note that Piaget does not attribute greater value to one of these forms of understanding than to the other. We are rather dealing with to completing and interdependent forms of understanding. Two interdependent aspects of learning.

According to Piaget all cognitive activities are activated by reasons of adaptation. Adaptation occurs as an adaptation against equilibrium (homeostasis). Herein lies Piaget's motivation concept - the actual reason that learning occurs. When disequilibrium exists (understood as a difference between your scheme of comprehension and the situation at hand) the individual activates activities (adaptation) in order to re-establish this. This re-establishment of equilibrium (adaptation of homeostasis), or rather an attempt to do this, can be carried out in different ways. And in these ways we find unfolded the concepts of assimilation and accommodation:

Assimilation occurs when the individual (with a view to obtaining equilibrium) *adapts*, *adjusts* or *adds* new aspects to the schemes he or she already has. Elements are thus added to the cognitive schemes in order to bring them in accordance with the surroundings.

Accommodation occurs when the adaptation requires a *new formation* or *restructuring* of existing cognitive schemes.

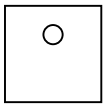
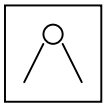
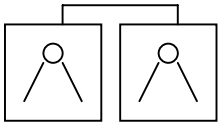
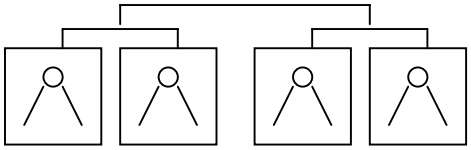
In economic models that operate with learning actors it seems relevant to distinguish between two different forms of learning: The cognitively abstract learning, which operates independent of the context, and the socially determined and contextually bound learning, which to a larger extent holds all of the non-logical areas of understanding. An economic model that allows the actors to learn must also exactly specify the nature of the learning, which will occur in the model; is it an additive construction of learning or a transgressive construction of learning? Is the learning dependent or independent of the context?

Jerome Bruner is another constructivistic classic, whose theories and ideas could vary the traditional economic perception of learning. Bruner's starting point is, as Piaget's, that learning is an active process of construction in which the learner constructs new ideas or new concepts on the basis of his actual knowledge. Bruner's learning actors actively choose and transform information, construct interpretations and make decisions based on previous constructions (mental models or schemes). Contrary to Piaget, learning is in Bruner's opinion to a larger extent a question of

meaning and meaningfulness. The cognitive (and affective) structures supply meaning and organisation to experiences - a meaningfulness that allows the actor to draw conclusions that *go beyond* the real quantity of information that lies within the actual experience. Bruner's project is, if you like, the construction of an epistemological science, which focus on the concept of meaning, and on the processes through which meaning is created and discussed in a community (Bruner 1990, p. 11). In this study of the learning actor culture becomes a central concept - a concept that is to be understood through interpretation. The study of the human understanding is so difficult - so caught up in the dilemma of being both the object and the agent of its own study, that it is not possible to limit one's methods to ways of thinking, which emerged from yesterday’s physics (Bruner 1990, p. xiii).

According to the economic rational we express our values in our choices. In situation upon situation we express our preferences - governed by rational models of utility maximising and cost minimising. These choices reveal a regularity which most of all resemble experiments with instrumental conditioning. However, to Bruner this regularity is interesting by virtue of its exceptions: its anomalies in relation to the basic assumptions about utility. These anomalies (which are often solved by the addition of new variables such as "snobbery", "commitment" or "indolence") indicate a fundamental problem in the economic models; that is, that they have difficulty in explaining how values emerge. Exactly in this area, I believe that Bruner's insight into the *process oriented* aspects of adaptation and learning represents a valuable perspective in the development of the economic perception of learning.

Gregory Bateson: Inspired by von Neumanns approach to game theory and Russle & Whitehead's *Principia Mathematica* Bateson introduces a class divided concept of learning in which he classifies learning in groups of connected levels.

	**Learning 0**. *No correction in choices – regardless of stimuli.* On this level of learning the actors actions are not the object of correction. An action is carried out with no eye to its consequences. It is open to discussion whether an actual "learning" (in the sense of change) takes place on this level.
	**Learning I.** *Choice between alternatives* Learning I is a change in the procedure of learning 0. This level of learning is best described by the expression ”trial and error”; An action elicits a consequence, which forms the basis of the following action. One thus readjusts one's choice within a set of unchanged alternatives. The most well known example of this level of learning is Pavlovs conditioning.
	**Learning II.** *Choice between a set of alternatives* Learning II is an extension of the process in learning I, e.g. a corrective change in the set of alternatives from which the choice is made. This level of learning has throughout time been known by several different names, such as e.g. "meta learning" or "deutero learning". Fundamentally, it covers the ability to learn-to-learn; a learning process in which focus is put on the set of alternatives available to the actor.
	**Learning III.** *Choice between systems of sets of alternatives* Learning III is an extension of learning II. Focus is no longer on the known possibilities available to the actor, but rather on the systems of alternatives, which are not (necessarily) available. Understanding at this level means a radical restructuring of the actor himself - and his way of perceiving the world around him.

In relation to a discussion of the economic actor's learning potential, it is interesting to notice that in this classification he is not assumed to be able to move beyond learning I, and from a learning perspective the economic actor is thus comparable to a rat in a cage. It is true that he learns through

trial and error, but he is never able to relate to his own learning or to the set of alternatives from which he can choose.

The economic actor is, of course, fictitious - he is a mental abstraction and a generalisation of certain (selected) characteristics of human behaviour, and in this respect he can be compared to Euclid's straight line in geometry or Newton's particle in physics. He is driven by few and idealised variables; primarily by his all pervading need for more and better (McFadden 1998, p. 11) and subsequently by his one-sided use of rational and cognitive reasoning in the collection or collation of information

There are, however, several reasons to doubt the assumptions that form the basis of this actor model. The limited learning, which is illustrated by Bateson's classes of connected levels, indicates an obvious weakness in the learning perspective of the actor model. Even though we seldom relate to our own learning process or restructure our self-perceptions, these higher levels describes a form of transgressional learning and an ability for innovation, which cannot be captivated in the traditional economic actor model.

The shear quantity of argumentation against this model understanding of human behaviour is steadily growing - and especially in areas where the model is used to explain behaviour that does not take place in a market. A fundamental question is therefore pressing. Is it possible that the learning theorists', psychologists' and sociologists' many experiments have made plausible that the economic actor in reality is an expression of a behavioural exception, rather than a rule? Anyhow, it resembles the perception of learning that lies in the model and not the perceptions of learning, which are dominating in other arts and social sciences - and it is even more improbable to if it actually describes the full spectrum or the actual nature of a human being's learning potential. The economists' assumptions of the rational and selfish human is today perhaps still the best example of an applicable model to explain behaviour in a market, but if future economists also wish to apply the model as the basis for an actor oriented understanding of learning, I believe that it will be necessary for them to have an eye to the theories of learning to correct the most obvious shortcomings of this model.

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