

Behavior and Institutional Change

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Abstract

The main aim is to explain, why we can observe strong persistence in human or firm behavior despite substantial change of economic environment and why persistence of informal institutions occurs. During recent two decades there were various trials to provide explanation of persistence of behavior based on presumption of existence of path dependency and increasing returns, reflecting findings of experimental economics with methodological background in bounded rationality or using simulations of interactions or networks. My practice is slightly different as I'm trying to incorporate findings of cognitive psychology and social cognitive learning into economics. Cognitive psychology implies that behavioral regularities, routines, are based on subjective mental models. Evolution of behavior can be now understood as evolution of routines and mental models, and thanks to their nature routines have high propensity to long persistence despite changing environment. This approach is applicable to evolution of informal institutions and it allows to explain persistence of them using shared mental models. Then informal institutions are seemed as behavioral regularities used by decisive part of the society and their evolution can be now described as diffusion of new behavioral regularity in the society and modeled using biased transmission approach.

1. Introduction

The main aim of this paper is to explain reasons, why we can observe strong persistence in human or firm behavior despite substantial change of economic environment (for example economic transition or oil shock) and why persistence of informal institutions occurs. During recent two decades there were various trials to provide explanation of persistence of behavior based on presumption of existence of path dependency and increasing returns, reflecting findings of experimental economics with methodological background in bounded rationality or using simulations of interactions or networks. My practice is slightly different as I'm trying to incorporate findings of cognitive psychology and social cognitive learning into economics and use it for explanation of those phenomena. The text is organized as follows: first Behaviorism and Cognitivism as two different perspectives of psychology are described and then several implications of cognitive psychology for economics are pointed out. Further persistence of behavior is justified and the role of observation for learning emphasized. Finally we used this framework for explanation of informal institutions as a consequence of shared mental models and this perspective enables to apply social cognitive learning to institutional change.

2. Behaviorism and Cognitivism in Psychology

According to mainstream microeconomics individuals and firms face to good structured situations, where case-by-case decision under certainty and optimization play central role in analysis of behavior and its consequences¹. It is assumed that complexity and uncertainty

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1 Extensive discussion about behavioral assumptions of economics can be found in Blaug (1980) or in North (1990). For further argumentation it is useful to point out several of these assumptions: The economic world is viewed as being in equilibrium, individual agents face repeatedly similar choices and they evaluate the outcomes according to stable criteria, each of them is able to identify the best opportunity from a set of all available choices and because the world is approximate equilibrium prevailing behavioral regularities are close to maximizing behavior. Last but not least adaptive processes to such an optimal choice are supposed to be approximately costless which is probably one of the most controversial assumptions if we want to study evolution of behavior.

don't play such important role for decision-making process that they should be included in analysis or, in other words, that optimization is a sufficient approximation of behavior because individuals and firms will be forced to change their behavior through competition, if they could achieve better results, so that it is behavior *as if* optimization (Friedman, 1953).

Perspective of psychology is slightly different, although both psychology and economics study behavior of individuals. Psychology explains determinants of human behavior, their motivational aspects², development of behavior, personality, interaction with others and other related topics. In economics, and especially modern microeconomics, it is simple, all aspects of motivation and changes of behavior were reduced to incentives defined by relative prices and their relation to utility or production function. Withal it is assumed that change in relative prices (etc.) would change allocation and so behavior would change, too. In fact this view corresponds to one of the main psychological school: behaviorism³. The main presumption of this school is that in order to explain human behavior it is not necessary to study mental processes. Roughly saying behavior can be explained without any knowledge about what happen in mind, because behavior is consequence of simple mechanism „stimuli-response” and following reinforcement, so it is purely deterministic, influenced by the environment and by genetic factors. As we will see this distinction is very important with respect to our main problem, evolution of behavior during institutional change.

On the other hand Cognitivism stresses importance of memory, attention, perception, reasoning, creativity and mental representation. Behavior is viewed as consequence of mental processes and simple „IF-THEN” perspective is combined with own experience of other actions, which happened in past or which were observed, so it is much broader. Difference between these two schools can be described on their attitude of learning. Cognitive psychology stresses the importance of perception of real world and re-elaboration or interpretation of obtained information in human minds. The idea is that there exists one “real world” and its ideal image in mind, called **mental model** (or cognitive map), which is schematic (in other words symbolic), subjective and basically incomplete representation of reality. These mental models cover the most essential relationships between various objects („cause-consequences-relations”) and all new acquired pieces of information are associated and confronted with previous experience and knowledge. Process of perception is assumed to be highly selective and the character of this selection depends strongly on experience of an individual and sometimes on coincidence as well. The same characteristic also holds for re-elaboration of knowledge.

3. Implementing Cognitive Psychology into Economics

Can be such cognitive approach implemented into economics? First we should summarize what are direct consequences for economics. Importance of mental processes means that not only incentives but also learning, experience and social network does matter as they influence perception of real world, this means that some events would be evaluated as incentives and others can happen without being registered. Also experience and observed behavior of other members of the society determine how perceived information would be re-elaborated and used in practice, if behavior changes or not and how. Furthermore it is reliable to assume that different people would react differently thanks to different knowledge, different direct experience etc. And adaptive or adjustment processes are hardly straightforward, neither instantaneous and nor costless, because lack of information, uncertainty and limited cognitive capacity. This means that agents are not able to evaluate outcomes of all possible actions in advance and sometimes they have problems to do that ex-

2 Contemporary psychology often follows explanation of Abraham Maslow, who introduced hierarchy of human needs theory. Any basic textbook of psychology can provide brief overview about this topic.

3 However most psychologists hold eclectic viewpoints that combine views of many schools.

post as well.⁴

Importance of such interpretation of equilibrium has been pointed out just by Alfred Marshall⁵ or Frank Knight⁶. Knight in his work *Risk, Uncertainty and Profit* wrote about „psychological elements” in preferences, about influence of social group, in which agents are embedded, on perception and on changes in preferences caused by change of fashion in the society, yet the main topic of his book is uncertainty and consequences of uncertainty on behavior and entrepreneurship. Uncertainty is according to Knight the main cause of profits as profits arise as consequences of changes in economic conditions that cannot be fully anticipated. He emphasized that the crucial point is our imperfect knowledge of the future, not change as such, which cause that consequences of change on profits would not be eliminated by competition (Knight, 1921, ch. 7). Adaptation to changes depends on foresight and conscious readjustment to predicted changes. Additionally „we perceive the world before we react to it, and we react not to what we perceive, but always to what we infer. We do not perceive the present as it is and in its totality, nor do we infer the future from the present with any high degree of dependability, nor yet do we accurately know the consequences of our own actions” (ibid.) because of uncertainty about the future. Decision-making process under uncertainty then can be classified with respect to the level of probability situations: a priori probability and statistical probability derived from empirical evaluation of frequency are known and on the other hand we have situations, in which agents have to rely only in his own estimates (ibid.). The latter one corresponds to uncertainty (or *Knightian uncertainty*) and previous two to risk, which can be modeled using expected utility theorem.

Many authors evolved further Knight’s ideas, although other approach in main-stream economics prevailed, and A. Alchian and H. Simon were perhaps the most influential of them. Armen Alchian in his famous article *Uncertainty, Evolution and Economic Theory* (Alchian, 1950) argued that under uncertainty the only goal of any choice is to achieve any positive outcome, not in principle an optimal or maximal one, and strategy is evaluated as a successful one if it leads to positive outcomes (or better outcomes than those resulting from strategies of the others) in a long term. The reason is that individuals are not able to evaluate the outcomes of possible strategies *ex ante* so they have to use trial-and-error behavior or to imitate successful patterns from their environment and which manner will be chosen is mostly question of good luck, accident and individual experience. Evolution itself, Alchian argues, doesn’t necessary assure convergence to optimal decisions if two conditions are not satisfied – good information feedback, which is easy identifiable by agents, and contracts, which run for a long time without substantial shocks.

Herbert Simon pointed out other aspect than pure uncertainty – as a psychologist he tried to implement most important findings of cognitive psychology into economics explicitly and so according to Simon the main problem with optimization or *as if* optimization was limited cognitive capacity of human mind. He explained that it is far unrealistic to assume that individuals are able to take into account all possible alternatives and he stressed out the importance of heuristics in behavior, high selectivity in searching processes and lack of information. Those limitations of rationality have lead Simon to introducing bounded form of rationality as an opposite to neoclassical fundamental rationality, where the only limits like

4 However relaxing assumptions of costless and instantaneous nature of adjustment processes is perhaps much more important for interpretation of economic models than the whole discussion about rationality in economics. Hodgson (2001) came to the same conclusion.

5 Especially chapter 1.3. of *Principles of Economics* „Economic Generalizations or Laws” is about the notion of equilibrium in economics, which should be viewed not as a state but as a tendency. Marshall distinguished also between physical and social laws etc. Marshall (1920). Hodgson (2001, p. 95 and followings) pointed out also another aspect of Marshall’s works, that historical specificity as the core argument of the German historical school was fully acknowledged by him.

6 See Knight (1921, ch. 5).

budget constraint etc. have external character. Thanks to lack of information individuals are forced to use their specific experience and knowledge to solve problems according to their subjective expectations of the outcomes and its probabilities (Simon, 1957) and behavior cannot be evaluated as optimal according to the outcomes but only if it is conscious and if it has any appropriate reasoning. As far as optimizing behavior concerns Simon suppose that usually it is not necessary to achieve strictly the optimal solution in order to increase utility but people try to satisfy their needs and wants.

Considerations about cognitive limitations, uncertainty, learning and importance of learning-by-doing, imitation and trial-and-errors behavior are reasons for rule-following approach to human behavior, because experience from various situations and problems push individuals to use successful/satisfactory/ strategies repeatedly, and after several trials routinely, and cognitive capacity is saved for evaluation of new situations. Such routines are according to Simon's work algorithms for more than 90% situations and are changed only if their utilization doesn't bring satisfactory outcomes. It is necessary to emphasize that evaluation of outcomes is very subjective and it is also connected with cognitive boundaries – sometimes some outcomes are evaluated as successful although they are not according future development, in that time unavailable information etc., so individuals and firms can use misleading strategies also in long-term.

Empirical research in the direction of problem-solving, decision-making process and creation of strategies made by Simon himself and other authors as well (namely March and Simon, 1958, Newell and Simon, 1972) demonstrated that the *as if* assumption is also untenable, because under strong uncertainty players' actions are not distributed around a single optimal strategy. Rather they are fully differentiated and none of them can be simply considered as a "best one" and this conclusion was also acknowledged by various experiments in experimental economics (Dosi, 1999, Egidi, 1996, Hogarth – Reder, eds., 1986). Others object that using mainstream microeconomics we cannot explain neither why some firms survive and some don't, nor if their profitability would continue also during next periods.

Simon's view of behavior as rule following and of decisions influenced by limited cognitive capacity was extended to analysis of firm and economic change by Richard Nelson and Sidney Winter in their book *An Evolutionary Theory of Economic Change*. They based their theory on routines and tacit knowledge inspired by Michael Polanyi in it. The meaning tacit knowledge can be easily summed up in one sentence "We do more than we can tell." (Nelson – Winter, 1982) which means that theoretical knowledge itself is useless if there are no practical skills, which often can be acquired only by learning-by-doing. Implication of tacit knowledge is that practical implementation and learning by doing are crucial for success of reuse and imitation of any action or routine. Processes of learning, adaptation and innovations become the highest importance for the theory of the firm and the whole set of routines including managerial skills, technological process, personal management, research and development and many others play a role significant at least as transaction costs and contracts emphasized by the new institutional economics for performance and ability of adaptation of each the firm or industrial sector. Nelson and Winter went so far that they compare the role of routines with genes in biology.

Mental processes and other aspects of human reasoning were mentioned also by Friedrich Hayek in his today quite forgotten book *The Sensory Order*. Hayek (1952) described causes of differences between real world and its reflection in mind – he found that every sensation is a consequence of subjective interpretation of any sensorial sensation and it is based on association with previous experience (that's the reason why interpretation is subjective and unique for each individual). Resulting mental models are stable nevertheless not strictly invariant and they evolve in time according to continuous evaluation of outcomes of

strategies. In this perspective Hayek's view is quite well compatible with Simon's concepts of bounded rationality and routines⁷.

4. Explaining Persistence of Behavior and Heterogeneity of Agents

In previous part we have mentioned bounded rationality and rule-following behavior as an opposite view to standard neoclassical microeconomics and now we devote our attention to persistence of behavior, routines and problems of formation and evolution of routines. We have just mentioned that behavior has mostly routinized character and that routines (or strategies) are left if their utilization doesn't bring satisfactory outcomes anymore and, because people are able to anticipate, also if new situation incompatible to an old one is expected. Also we pointed out that usage of routines in most actions saves cognitive capacity for solving of new problems or for dealing with unexpected outcomes of actions, so implicitly we suppose that cognitive capacity is „scarce good” as such, expressed in terms of economics.

The main contribution of cognitive psychology to explanation of process of abandoning old routine, formation of new one, mechanisms of acquiring new knowledge and learning follows: routines are viewed as products of learned and adopted behavior represented by subjective mental models. This means that evolution of behavior corresponds to evolution of routines and as routines are in accordance with agent's mental models, evolution of routines is followed by change of mental models as well, because the source of change – relevant information - was perceived and represented in particular mental model.

In fact in comparison with economics the psychology is much more sceptic to human capabilities and it supposes that changes in mental models, which result in changes in behavior, are very gradual and slow. Realization of any shift of routines is mostly a question of intensity of incentive and its harmony with other aims and motivations. Additionally individuals are often bounded in their capabilities to evaluate if their routines are suitable or not as it was just mentioned in previous section.⁸

Cognitive approach leads to an important question – what is then a difference between case-by-case decision making and rule-following behavior based on subjective mental models if although the latter considers a dynamic selection, so this seems to be in accordance with Friedman's defense of neoclassical assumptions? Dosi et al. (1999) found that in general surviving agents use routines, like mark-up pricing or simple imitative behavior, in all environments they experimented except the simplest ones. Only in very simple cases they observed behavior not far from assumed rational agents would do. Thus the conclusion from their experiments is that the more complex situation and tasks are, the simpler behavioral norms tend to be used and the more relevant information would be omitted. This is very similar conclusion to those of Herbert Simon, Ronald Heiner and others.⁹

Until now we have shown that behavior can persist despite changing environment because of the nature of routines. Other reasons are connected with the fact, that at the firm-level adaptation (or implementation) of new routine is costly because it requires specific investment into both human and physical capital. And those investments are usually performed under strong uncertainty about future profits resulting from those investments. In addition choice of routine itself creates strong incentives for abidance in it as staying on one routine brings gradual improving in efficiency through learning no matter, if it has been optimal or not. Other reason for persistence of routines is nature of learning process itself – this process is much easier for individual agent than for firm or other organization because individuals don't have to solve problems with coordination etc. However individual agents

7 Many notes to similarities between Hayek's and Simon's view are in (Loasby, 2003).

8 The idea that agents tend to explain causes of undesired outcomes by coincidence and the like was confirmed by experiments – nice illustration can be found in (Egidi, 2002).

9 Dosi et al. (1999) came to these conclusions from series of simulations based on genetic programming.

(and of course organizations as well) are often limited by their readiness to admit that their strategy is not the optimal one according to (perhaps changed, but not only) situation and they tend to explain causes of undesired consequences by coincidence and the like. There is also another cause of limitations for both firms and individuals that bear on shady and chaotic nature of information according to them they judge their behavior.

Nature of the firm as organization with routinized behavior and tacit knowledge leads to different results in case of economic change than standard microeconomic theory offers: the first concept of representative firm is rejected because each the firm has its specific experience and routines of production, management, marketing and research and development, the second external change is not described with costless shift to a new equilibrium anymore but it is viewed as a complex process of adaptation with respect to firm- and branch-specific conditions.

Such adaptation is everything else than instantaneous and usually possibilities for shifting to a new routine are constrained in a short-term by various reasons like long-term contracts (but they slightly increase in a long-term). External change also increases fundamental uncertainty; this results into higher probability of false interpretation of information and investments into adaptation became more risky because of high uncertainty about expected gains from available alternatives. In this case decision-making process seems to be very subjective and it depends on experience and knowledge of each the firm and now history matters. So it is reasonable to expect that investments into adaptation would differ – differences between all firms would increase with respect to the level of uncertainty – and now there's a crucial question if there would be any convergence in realized actions in consequence of natural selection, imitation and so on. The answer is not trivial and further empirical research mostly based on case studies is needed in order to build consistent theoretical framework and to find determinants of convergence to one or few patterns.

5. Learning in Economics and in Psychology

The basic statement from previous sections is that routines are changed if the old ones lead to unsatisfactory results or if they are evaluated as incompatible with expected problems. Then, expecting change in external environment, agent has basically two possibilities, either he use routine, which is similar or identical to one stored in his mind, or he interprets it as a new problem and forms a new routine. However how is new routine formed? New routine is acquired through learning process, which is usually conscious. Nature of learning and various approaches to it are discussed in this section.

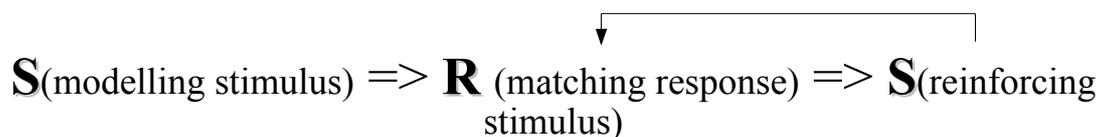
Economists often deal with simple mechanic learning-by-doing, learning and this kind of learning can be easy modeled, however it is quite difficult to deal with creativity, qualitative change of routines and change from one behavioral regularity to another one, let's say because the former was inappropriate to current situation. Psychological definition of learning is much broader: Learning is the process of acquiring knowledge, skills, attitudes, or values, through study, experience, or teaching that causes a change of behavior that is persistent and allows an individual to formulate a new mental model (or revise a prior one). With respect to cognitive psychology and namely to its relation to behaviorism and microeconomics it is more relevant to deal with problem of acquiring new knowledge and routine in case reaction to some kind of exogenous change, in other words to adjustment of behavior, than to discuss various theories of learning here, which were often developed in order to understand educational processes.

So, assume an agent who knows that his routine must be changed unless his income would decrease below satisfactory level. In fact agent got impulse, so called stimulus, from his environment. With respect to persistence of behavior and reactions to stimuli we can (following Bandura, 1975) distinguish two basic kinds of learning – first on trial-error based

learning by response consequences and second social cognitive learning, (alternatively learning through symbolic modeling or observational learning), which means acquiring new knowledge or skill through observation and imitation of other agents in similar situations, corresponding to cognitive psychology.

Mechanism of learning by response consequences (depicted on Figure 5.1.) emphasize the role of direct experience and it results from positive and negative effects that action produce. Those with better outcome than others are selected and inferior abandoned. First stimulus (incentive from the environment is modeled, this means that agent acquire an information and evaluates outcomes of possible alternatives. Then second stage, called matching response, takes a place in which some of evaluated actions is applied. Finally reinforcing stimulus transmits information if that action leads to success or failure to agent and responses corresponding to the models' actions are positively reinforced and thanks to it also re-used, however divergent responses are either unrewarded or punished.

Figure 5.1. Learning by Response Consequences



Source: Bandura (1975, p. 38)

Reinforcement theories are useful for regulation of behavior that has already been learned, but it is a relatively inefficient way of creating them. In fact process of formation of new behavioral regularity remains unexplained. However approach of social learning and cognitive psychology says that people do not rely solely on the effects of their own actions and substantial part of behavior is acquired observationally through modelling actions of others – observation helps to form an idea how some kind of behavior is being performed and such information is coded and stored for later occasions. So it is reasonable to ask, what are conditions and determinants of successful imitation, how mechanism of social learning looks like in comparison with learning by response consequences and in which situations observational learning prevails.

Bandura (1975, p. 22-29) identified four components required for modeling (imitation) of behavior of somebody else:

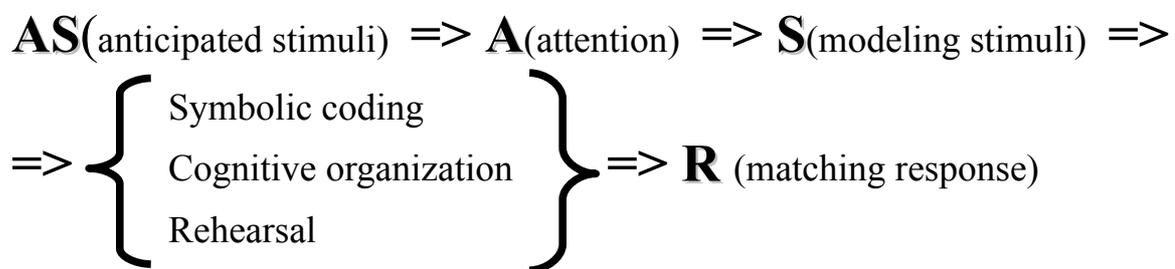
- Attention as agent must first observe and perceive actions of others. Those attentional processes are strongly shaped by social network, simply by group of individuals, in which agents live. This means actions of firms depend on actions of other firms, competitors etc. and in fact there is only minority of new firms who explore some completely new way how to do something. Experience and communication influence what will be observed, then really perceived, re-elaborated, stored and used in the future.
- Retention of actions is a second condition. Agents try to understand and remember, what the imitated agent does, and to include as much details as possible. Retention processes consist from three main parts: symbolic coding (highlighting essential components of imitated actions and their representation with abstract symbols), cognitive organization (association with current mental models and previous experience) and finally rehearsal, both symbolic and motor, in which learning-by-doing and gradual improvements take a place.
- Motor reproduction process and real replication of behavior is a following stage of imitation, which is constrained by physical capabilities, quality of self-observation

and accurate feedback.

- Motivational processes and opportunity are also essential part of imitation, because the observer must be motivated to carry out the action he has observed and remembered, thanks to external or internal reinforcement in order to fulfill subjective criteria of income or whatever. Necessarily he must have an opportunity to do that.

In comparison to learning by response consequences social cognitive learning suppose that behavior of others comes to function as a cue for matching process. Furthermore according to social learning view, observational learning occurs through symbolic processes during exposure to modeled activities in advance to any responses, so it does need to rely on extrinsic reinforcement. So different stimulus must not lead to abrupt change of behavior if it was anticipated, on the other hand some stimuli can left behavior unchanged as agents do not observe it and also that stimulus must be first perceived and second re-elaborated by agent in order to change behavior correspondingly.

Figure 5.2. Social cognitive learning.



Source: Bandura (1975, p. 38)

The social cognitive learning theory explains learning leading to behavioral change starting with anticipation of stimuli thanks to information or active observation in advance about costs and benefits of acquiring new model, so it is not only passive waiting until imitation spontaneously emerges. Anticipation of stimuli is then followed with stage of attention and consequent modeling stimuli. Then cognitive processes are used as stimuli are coded into symbols, associated with existing mental models and new behavior is rehearsed. Finally after matching response and reinforcement new behavioral regularity emerges. Nevertheless here reinforcement plays slightly another role, it has mainly antecedent influence as also reinforcement is anticipated, because what is rewarded or punished and how much determines what will be modeled and what goes unnoticed. This implies that in social learning theory reinforcement is considered more as a facilitate condition rather than necessary one (Bandura, 1975, p. 37) Change of behavior through learning from social learning perspective is summarized in a figure 5.2.

Now we have two alternative approaches to learning, but which one to choose? Trial-error or observing others and wait-and-see strategies? The later prevails in case at risk-averse population and is more common in situations where costs of possible mistakes are to high (Bandura, 1975, p. 10). So learning depends not only on economic environment but also on social environment, on experience and knowledge how to find what is important and what is not and so learning processes are highly path dependent and everything else than instantaneous. Such knowledge and experience necessarily differ through population as well as available set of information and this leads to divergence in behavioral regularities. If consequent process of adaptation through imitation and learning leads to convergence is not clear and we suppose that no universal law exists.

6. Diffusion of New Behavioral Regularity.

So far the discussion has been concerned mainly with learning and behavior at the individual level and now we turn to the problem of how new ideas, social practices or behavioral regularities are spread within society from one agent to another one. In fact successful diffusion of innovation¹⁰ follows usually a common pattern as new behavior is introduced by prominent examples and then adopted at accelerating rate by other agents, followers. After some time either stabilization occurs or new idea is declined upon its functional value.

The general pattern of diffusion is similar, but the mode of transmission is slightly different and it consists from two parts, first acquisition of innovative behavior takes a place and adoption in practice follows. During the stage of acquisition modelling plays important role in spreading new ideas and social practices within a society or from one society to another. In this stage new knowledge and information about possible benefits are acquired and modeling directly instructs people in new styles behavior through social, verbal or pictorial display. Consequently some agents change their patterns and further modeling of expected benefits accelerates diffusion by weakening the restraints of the more cautious potential adopters. At this point personal interactions influence diffusion of information about novelty through existing networks of interpersonal communication. During the second stage initial reluctance of most agents is either overwhelmed and change in their attitudes occurs or effects of adoption are not persuasive enough and spread of innovation stops. Reinforcement plays here specific role as benefits cannot be experienced until new practices are tried and adoption of innovation depends on anticipated and vicarious enforcement rather than on direct one (Bandura 1975, p. 52).

Presented nature of diffusion process implies substantial heterogeneity of agents, Bandura itself (following Rogers, 1962) explicitly deals with this structure of agents: innovators – first adopters – later adopters and laggards and assumes it to be a general structure (Bandura 1975, p. 53). Differences among agents are in this approach natural consequence of differences in different experience of agents according to social group, branch and country-specific development and of different human qualities. Also behavior of other agents in their social network influence which stimuli would be perceived and re-elaborated, the same effect has corporate culture etc.

Perhaps the main implication for economics resulting from social learning theory and other psychological insights into economics is that the concept of representative firm is sometimes inappropriate and too restrictive assumption, which could lead to unrealistic predictions. However using this approach we don't have any problem with persistent differences in corporate governance models, ownership structure at the firm-level and different goals and methods of managers. Also it is natural to assume that convergence to one, the most efficient pattern is neither automatic and nor desirable thanks to different conditions. Obviously this does not mean that convergence cannot happen and that we must abandon the whole concept of representative consumer and firm, for many purposes these concepts are good enough to provide valuable predictions.

7. Explaining Nature of Institutions - From Shared Mental Models to Institutions

Learning of individual as described before can be viewed as a process of reinterpretation of current mental models. On the other hand learning at the societal level was described as a diffusion of new behavioral regularities in the society and we found that transmission of new knowledge depends on information acquired either by personal experience or observation of

¹⁰ It is important to note that innovation does not represent only technological or commercial change but also new behavioral regularity (Bandura, 1975, Budzinski, 2003, Henrich 2001)

others and communication. Reasonably communication and observation lead partly and incompletely to a compatibility of mental models of individuals from the same sociocultural environment. Still each person evaluates new situations individually and subjectively but common knowledge emerges and leads to analogous mental models in decisive part of the group. Shared knowledge then turns into shared mental and those further influence behavior of those agents (Denzau-North, 1994), because the more shared mental models are formed, the more homogeneous cognitive processes such as attention and interpretation and resulting behavior will be.

Set of shared mental models leads to institutional set of the society, to culture, in E. Taylor's words "complex of knowledge, belief, art, moral, norms and other capabilities and habits adopted by individual as a member of community" (Taylor, 1871). This definition of culture contains one important feature – it is adopted through imitation, experience and learning and it is highly insufficient if it is only written in books. Cultural anthropology calls such process of „learning culture” cultural transmission process¹¹.

Here we consider the notion institutions in a very broad meaning in the same way as D. North does: "Institutions include any form of constraint that human beings devise to shape human interaction." (North, 1990, p.4) Those constraints help to reduce uncertainty in everyday life inasmuch that they define and constrain individual's choice. This simplifies anticipation behavior of other agents and directly reduces transaction costs in the economy. Importance of stability of institutional framework results from this approach because uncertainty couldn't be reduced in turbulent environment. Hence stability of institutions is more important for economic development and growth than their one hundred percent efficiency.

Institutions are usually derived into formal and informal institutions according to their form and type of enforcement, formal ones are laws or other written norms, which arise usually from political process, and informal ones are set of norms, habits, traditions, common knowledge and so on, simply building blocks of culture¹². As North and others noted (North, 1990, chapter 5) informal institutions are much more important than the formal ones, which of course also form behavior but we should stress that it is more implicit and indirect process than explicit learning of formal rules and behavior in accordance with them. Jurisprudence calls this as behavior *secundum legem* – in accordance with (written) law, although most of us don't know exactly what is written in any legal code. More important thing for everyday use is moral and the main importance of written law stays in judging of conflict situations among interests of more individuals.

However difference between formal and informal institutions concerns also mechanisms of their formation and evolution as well. Formal institutions are product of political process while informal ones are result of evolutionary process as consequences of shared mental models. In fact we can abstract from this difference if and only if formal institutions were codification of existing informal institutions in order to lower transaction costs by unifying and clarifying it. Unfortunately situation is usually slightly different and various interest groups, who want to secure or improve their position, often influence process of adoption of formal institutions and analysis of formal institution should take rent seeking and state capture reality into account.

The indivisible part of institutional framework is enforcement of institutions. The situation is clear at formal institutions, because the state authority at least should be able to guarantee abidance by laws, but as we could see in transition countries in previous decade it is

11 Boyd-Richerson (1994) described not only cultural evolution, but they explored also effects of biological and cultural evolution to each other, they called their model as „dual inheritance model”.

12 Broader and more extensive discussion about various types of institutions can be found elsewhere, see for example Budzinski (2003) for more detailed discussion.

not self-evident. Differentiated will enforce some norms and some doesn't depend on attitude of decisive part of the society to that norm which could be either *rule-harmony* or *rule-conflict* (Budzinski, 2003).

Harmonic relationship between informal and formal institutions occurs if individuals intuitively consider existing formal institutions as correct no matter if thanks to education and process of socialization or thanks to adjustment of individual preferences to social norms and written legal rules. Rule-harmony by itself leads to integration of institutions and own cognitive theories of individual into one entity and institution become important for him not only because there's some enforcement and potential punishment but because he finds it simply beneficial.

According to these considerations it is natural to expect that enforcement would be without substantial complications since all individuals would find violation of rule as their own endangerment and legal enforcement would be followed by social ostracism. However it doesn't mean that organized enforcement would be redundant, because continuous violations of norm also by few individuals can cause erosion of that norm and increase pressure to its abandonment.

In case of rule-conflict relationship institution is found as "bad" for most members of the society. In fact such conflict can arise only if unexpected change of the environment, which influences preferences of most people or leads to erosion of persistent norms, or on the other hand at formal rules, which don't codify common law and shared norms but which arise in political process under influence of rent-seeking activities and corruption. Results can be either continuous violation or increased effort to change that rule and process of institutional change would occur although sometimes this could take place only after external shock which push decisive part to change its behavior like revolution and the like. If important part of the society abandon this rule and others follow social enforcement mechanisms erode and social consensus is lost. Now enforcement loses its functionality and sometimes legitimacy as well, this would be also the same in case of formal institutions where enforcement cease to insist on social consensus.

8. Social Cognitive Learning, Cultural Anthropology and Institutional Change

Cognitive approach to behavior developed in previous section based on rule-following behavior, learning through both own experience and observation of other agents together with interpretation of institutions as a consequence of shared mental models allows us to describe their evolution as diffusion of new behavioral regularity in the society. Success of such diffusion depends on character of new one, which can be either in conflict or in harmony to current institutional framework, and on expected profit of adoption. Such expectations are formed upon own experience of each agent and observed benefits of adoption at those agents, who have already adopted. Both own cognitive capabilities and social environment (existing interpersonal network of communication) determine perception of information about novelty, agents from social group of „optimists”, let's say those, whose experience supports hypothesis of positive effect of innovative behavior, will tend to be optimistic as well, the same holds for the opposite situations of „pessimists”. Of course if the new regularity is beneficial enough, adoption of new rule can be much faster and easier because related information of its advantage spreads rapidly and it is easily recognized and so imitated by other agents.

Such perspective on evolution of informal institutions corresponds well to biased transmission of norms, an approach of cultural anthropology¹³. Process of biased transmission

13 Boyd and Richerson (1994) deal with two types of transmission of memes (theoretical concept of units of cultural information, similar to genes in biology), unbiased, in which population of descendants has the same proportion of memes as their parents, and as an opposite – biased transmission reflecting that people preferentially adopt some memes rather than others.

at least implicitly deals with comparison of alternative patterns of behavior and subsequent choice of them (Boyd – Richerson, 1994, p. 81) and from this point of view it can be likened to dynamics of diffusion of innovative technologies as described by Rogers (1962), David (1975) etc. and differences among agents lead to different times of switch from one technology (or behavioral regularity) to another. Hence the rate of cultural change, the level of agents with changed behavior, depends on the variability in the population and adoption curve is mostly S-shaped. This shape means first only few agents adopt new rule, after some other agents change their behavior thanks to observed effect of change and the more people are exposed to it the more the rate of diffusion accelerates until the old rule becomes rare and only few agents insist on the former rule. So probability of adoption of new behavioral regularity or institution is positively correlated with share of group using new rule or norm on whole population thanks to social acceptance, effects of coordination and, in case of innovation, forces of competition.

However several questions remain still unsolved. First using framework of biased cultural transmission can be criticized as benefits of any particular attitude, norm or rule cannot be simply evaluated, so biased transmission and observation of others can explain change of institutions only partially. Other aspect concerns impact of incentive structure resulting from new law system or from change in relative prices. Incentives can either facilitate change of behavioral regularities or prevent from them. What effect prevails will depend on complex set of whole law system and on subjective perception of it. Also behavior of other agents like from financial sector will shape incentive structure as they control financial resources. Established norms of lending financial resources will play crucial role in adjustment processes influencing accessibility of them. As far as change of behavior caused by incentives concerns we can only repeat basic conclusions from the second section, that new routine is adopted if incentive is strong and if it has direct impact to outcomes of behavior so it is easily recognizable.

9. Conclusions

Cognitive psychology tells us that such routines are based on subjective mental models at the individual level. Evolution of behavior can be now understood as evolution of those routines and mental models, and thanks to their nature routines have high propensity to long persistence despite changing environment. Other reason for persistence of routines is nature of learning process itself. In accordance with psychology I deal with two types of learning, not only with learning-by-doing, which is very often used in economics, but also with so called observational learning – learning according to expectations of future development and learning through imitation. The later prevails in case at risk-averse population and is more common in situations where costs of possible mistakes are to high. So learning depends not only on economic environment but also on social environment, on experience and knowledge how to find what is important and what is not and so learning processes are highly path dependent and everything else than instantaneous. Such knowledge and experience necessarily differ through population as well as available set of information and this leads to divergence in behavioral regularities. If consequent process of adaptation through imitation and learning leads to convergence is not clear and we suppose that no universal law exists.

This approach to behavior is easy applicable to evolution of informal institutions and it allows to explain persistence of them using shared mental models. Informal institutions are seemed as behavioral regularities used by decisive part of the society and their evolution can be now described as diffusion of new behavioral regularity in the society, which is similar to diffusion of innovation, and this perspective is compatible with a framework of cultural anthropology called biased transmission.

However several points remain unsolved, first biased transmission deals with selection

criterion, which can be only implicit, and second we are not able to find explicit relationship between forces of institutional change and incentives. The only thing which we know surely is that if incentives are high and evident, change of behavior is faster, but we really cannot find universal factors, which help to push adjustment processes or which limit them. This holds also for empirical studies about adjustment of firms to new market conditions in former central-planned economies. Maybe such factors don't exist at all and in this perspective concept of path dependency seems to be only the other name for historical specificity.

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