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The role of tacit knowing in adherence to social norms

O papel do conhecimento tácito na adesão às normas sociais

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ABSTRACT

This paper aims to contribute to the ongoing discussion on adherence to social norms. It considers insights from multiple research traditions in an effort to explain how individual learning and action are connected to social norms. One strand of philosophical tradition holds that non-representational learning and skillful coping carried out unconsciously are underestimated by both scientific and philosophical traditions. The present research combines this tradition with the literature on the evolution of social norms and suggests that experienced individuals in a society adhere to social norms better than novice agents do. We explain this phenomenon by unconscious and non-representational cognitive processes. This framework is then used to investigate population-level outcomes of individual learning.

Keywords: adherence to norms, expertise, skillful coping.

RESUMO

Este artigo tem como objetivo contribuir para a discussão em curso sobre a adesão às normas sociais. Ele cosnidera insights de múltiplas tradições de pesquisa em um esforço para explicar como a aprendizagem e a ação individuais estão conectadas às normas sociais. Uma vertente da tradição filosófica sustenta que a aprendizagem não representacional e o enfrentamento hábil inconscientemente são subestimados pelas tradições científicas e filosóficas. A presente pesquisa combina esta tradição com a literatura sobre a evolução das normas sociais e sugere que os indivíduos experientes em uma sociedade adiram às normas sociais melhor do que os agentes novatos. Explicamos este fenômeno por processos cognitivos inconscientes e não representativos. Este quadro é então utilizado para investigar resultados de nível individual da aprendizagem individual.

Palavras-chave: aderência às normas, perícia, habilidades de enfrentamento.

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Introduction

The paper investigates how implicit learning affects the formation of social norms and rule following in societies. The role of learning and tacit knowledge has been a consideration

in economics since the studies by Hayek (1937, 1945) and Nelson and Winter (1982). Herein, the paper posits that their research on price formation in markets and production organization in firms could be extended to adherence to norms and rule-following behavior in societies. In essence, tacit knowledge and unconscious coping abilities—the hallmarks of expertise—have significant effects on rule-following behavior. Moreover, the rational actor model cannot adequately capture these effects when population-level outcomes are considered.

The classical constitutional conundrum, according to Samuel Bowles (2006), is the fundamental problem of all societies. It is about how to harmonize individual preferences and social outcomes. In other words, how can we direct, if indeed necessary, self-interested individuals toward actions for the benefit of society? In answering this question and considering its variations the literature is inconsistent, as a result of differences in assumptions, presumptions, and methods. On the one hand, mechanical and rational answers dominate the agenda, as behavior is reduced to the calculation of costs and benefits, on the other hand, intuition, disposition, and arational patterns are used to explain the formation and evolution of behavior.

On the other hand, disciplines including philosophy, economics, and biology deal with the issue. Philosophy employs the analytical tradition and phenomenology, economics uses neoclassical theory and new institutional theory, and cognitive science uses symbolism and connectionism. All of these research disciplines maintain the division mentioned above and provide conflicting explanations for the causes and implications of the classical constitutional conundrum.

In the paper, it is attempted to bring together the approaches of these two traditions to explain adherence to norms in societies. The rational actor model and 'pure logic of choice' are not adequate for gaining an understanding of norm adherence; however, criticism alone is not sufficient. Our aim is to use the findings of conflicting approaches in a complementary manner to synthesize an explanation for rule-following behavior. The theoretical and empirical literature on both sides is extensive, but to the best of our knowledge few researchers have brought them together, notably Lane *et al.* (1996), Langlois (1998), Negru (2013); see also Opp (2013) and Aydogmus *et al.* (2015). It is our aim to highlight the possibility of bridging these divergent paths. In this regard, this paper further develops the arguments in Aydogmus *et al.* (2015).

The paper begins with a review of the literature on unconscious cognitive processes and its philosophical basis. Next, evolutionary literature on the formation and evolution of social norms is reviewed. Then, a simple game theoretic example is provided on how studies on rule-following behavior could be improved by taking into account unconscious cognitive processes. Lastly, the implications of our framework and further research needs are discussed.

Unconscious cognitive processes in decision-making: non-representational abilities

When it comes to norm formation at the societal level, individuals' decisions and the evolution of their behavior are important microdeterminants. That is why the way individuals learn and the way their decisions evolve are also important. How does an individual choose to act according to a norm? The dilemma to consider is whether individuals act rationally in a complex environment, as Herbert Simon (1996) suggests, or do they use skills beyond their conceptual framework, without (consciously) thinking about them, as Hubert Dreyfus and Stuart Dreyfus (1980, 1988) insist. The answers to these questions have implications for the formation and persistence of norms.

Maurice Merleau-Ponty's (1996) embodied knowledge, Michael Polanyi's (2012) skills, and Dreyfus's (1993) work relating both concepts to modern cognitive science constitute the epistemological background of the present work. They highlight the importance of unconscious cognitive capacity and contend that unconsciously formed skills and tacit knowledge play a primary role in how individuals understand and cope with reality.

Learning and action cannot be explained by referring only to intentional and representational content. For example, an individual does not consciously make complex physical calculations when bicycling, even though it appears to be necessary for balancing a bicycle. To safely stop a moving car an individual does not need to calculate the stopping distance, according to such variables as the current speed, state of the brake pads, friction between the road and tires, and air resistance. Individuals cope with life with the help of multiple capacities, some of which are not consciously controlled. These capacities seem to lack conscious representational content.

By introducing the concept of "tacit knowledge" Polanyi (2012 [1958]) makes a significant contribution to the philosophy of mind and action. Tacit knowledge, unlike explicit or codified knowledge, is extremely difficult or impossible to codify (express with language) and transfer to others. Knowledge of riding a bicycle, playing tennis, or driving a car are examples of knowledge with tacit content. In the remainder of this paper these adaptive behaviors based on unconscious skills and/or tacit knowledge will be referred to as skillful coping, according to Dreyfus (1993). To acquire such knowledge or skills an individual needs to go through an appropriate sequence of experiences relevant to the skill being acquired. According to Polanyi (2012 [1958]), skills are performed and assessed via subsidiary awareness. Such knowledge, skills and tools associated with them become internalized via experience. Polanyi suggests that they become integral to us in the same sense that our limbs are part of us. As such, a racket becomes an integral part of a professional tennis player and a walking stick becomes an integral part of a blind man.

In both cases, unlike a novice, an expert does not need to pay attention to the use of his/her tool; it is as if they are using their own limbs.

According to Dreyfus's theory, which is based on Merleau-Ponty's (1996) *Phenomenology of Perception*, learning is not independent of the body. At least some knowledge becomes part of one's unconscious decision-making pattern and becomes a skill. Tacit knowing and skills of this type become endogenous to the decision-making process, without representational content in the mind of the individual (Dreyfus and Dreyfus, 2004; Dreyfus, 1993, p. 24). In essence, skill acquisition reduces the costly burden of rational calculation without compromising the outcome.

Hubert Dreyfus and Stuart Dreyfus (1988) describe five discrete stages of learning, from novice to expert: Novice; advanced beginner; competence; proficiency; expert. Throughout the process of advancing from novice to expert, individuals acquire new knowledge and behavioral patterns. While in the first few stages a learner acts in a rule-driven manner, in the later stages experience is assimilated in such a way that intuitive reactions replace reasoned responses. On the road to expertise an individual recognizes increasingly more patterns and behaves according to newly acquired skills. While moving through these five stages an individual becomes less procedure-driven, less analytical, and more intuitive (Dreyfus and Dreyfus, 2004, 1988, 1980).

Merleau-Ponty, Polanyi, and Dreyfus agree that unconscious processes play a pivotal role in our behaviors and discredit all attempts to analyze cognition without considering these processes. They also support the notion of a holistic approach to learning and the importance of human interaction with the environment. It is our conclusion that unconscious cognitive processes could be classified as follows: (a) Non-representationality: Skillful coping is not accompanied by representational ideas and analytical processes. Instead, it is integral to the body. (b) Holistic nature: Skillful coping is holistic. (c) Experience dependence: Skillful coping improves with experience. (d) Stability: They are less sensitive to conscious cognitive changes and this makes them more stable. That is to say, they do not change all of a sudden. Instead, they change gradually. To illustrate, both learning and unlearning bicycling happen gradually and continuously in contrast to learning how to multiply two integers or learning the capital city of Austria.

According to Hubert Dreyfus and Stuart Dreyfus (1988), modern philosophy of mind and artificial intelligence research underestimate the importance of non-representational learning, namely, learning that is not mediated by consciously accessible representations. Similarly, in economics it is also highlighted that the actions of individuals are only partially explainable by conscious processes. In these approaches, which are critical to the mainstream idea that representational skills and knowledge are the only determinants of decision making, it is argued that unconscious cognitive processes are the hallmark of expertise (Lane *et al.*, 1996, p. 52). As more feedback accumulates, individuals progress from novice to expert. In complex environments a novice simply relies on analytical computations and rationality, with limited cognitive resources, whereas experts employ a holistic, non-representational approach. Expert individuals "experience and understand their worlds only through their interactions with other agents" (Lane *et al.*, 1996, p. 75). The rational actor model in economics cannot adequately explain expertise of this sort (Lane *et al.*, 1996).

In general, unconscious cognitive abilities are associated with expertise in a task, *e.g.* hitting a tennis ball with top spin. However, these abilities and tendencies are not only confined to these kinds of tasks but also are related to norm-following behavior in societies. Just like in the case of expert and novice tennis players in which the former unconsciously does more tasks compared to the latter, in norm-related contexts *experts* unconsciously perform more norm-related tasks than novice individuals. In other words, we enlarge the extent of "expertise" to include norm-related decisions and skills such that individuals who have been members of their respective societies for longer periods of time, accumulate and internalize experience and use them unconsciously are qualified as experts. Moreover, the characteristics of task-related unconscious cognitive processes, *i.e.* non-representationality, holistic nature, experience dependence and stability are shared by norm-related unconscious cognitive processes which are the hallmarks of expertise in social contexts.

Evolution of and adherence to norms in societies

Is expertise that results from social interactions a factor associated with adherence to social norms? Put in another way, how does learning or expertise affect adherence to social norms? When individuals make decisions, they usually do not consider the effects their decisions have on society (Hardin, 1968); however, such consideration is of utmost importance to evolutionary social theory. As Gintis (2007) points out, the beliefs, constraints, and preferences of individuals in the social sphere matter. As such, individual learning makes sense in a framework in which reconciliation of individual and social outcomes is properly addressed (Bowles, 2006). Therefore, the evolutionary approach emphasizes that individual learning occurs in an environment characterized by strategic interactions.

As discussed in the previous section, there is a vast literature on the complexity of decision making and coping with it. Bounded rationality, according to Simon (1996), highlights our limited capacity to engage in complex issues. We economize the use of our limited cognitive capacities by adhering to evolved rules of thumb. Other mechanisms that enable individuals and society to cope with complexity include unconscious cognitive processes and evolved social norms. These mechanisms are foundational to how we think and behave (Young, 2015). In other words, unconscious cognitive processes and adherence to social norms reduce the cognitive cost of acquiring skills (Boyd and Richerson, 1985).

Rather than deciding which social norms to follow and which not to, individuals simply inherit surviving social norms and learn through interaction with others. In this regard, expert agents have the ability to adhere to social norms and exhibit appropriate behavior in novel situations. It is suggested that expertise is related to the agent's level of understanding of the social context in which he/she is interacting, which is acquired via multiple interactions over time (Lane *et al.*, 1996). Thus, according to evolutionary game theory it is reasonable to assume that the behavior of expert agents may "lead to novel situations that the participants construct together in anticipation of mutual benefits that they cannot clearly foresee [...]" (Lane *et al.*, 1996, p. 61).

In this framework social norms evolve through dynamic learning and these norms form the basis of social and economic order (Young, 2015). In other words, adherence to social norms provides the basis of social order. Here we add to this framework the notion that expert agents adhere to social norms in greater number than novice agents, resulting in social order. The inclusion of expert agents in a game-theoretical framework can significantly improve our understanding of adherence to social norms.

Evolutionary game theory usually treats the evolution of social norms as a non-cooperative common interest game (Bowles, 2006). Common interest is crucial to the formation of social norms, as the percentage of a population that wants a particular social outcome must reach a threshold level for the behavior associated with the desired outcome to be accepted as a social norm. In this case, adherence to the social norm provides great benefit to both individuals and society. In contrast, social norm violation is beneficial to free riders, as norm enforcement is endogenous, *i.e.* it is individual social agents that decide for themselves whether or not to adhere to norms. The development and evolution of social norms has been a focal point of researchers (Hamilton, 1964; Trivers, 1971). Expert agents generally adhere to social norms, which is beneficial to society. The following section provides an example that illustrates how novice and expert social agents adhere to traffic rules, *i.e.* a social norm.

Formation of traffic rules

Consider cooperation in traffic as discussed in Aydogmus *et al.* (2015). The evolution of cooperation in traffic can simply be represented as a prisoner's dilemma (PD) game, as follows. For the sake of simplicity, consider two drivers trying to reach their destinations. If there is no traffic both drivers reach their destination in 10 minutes and if there is traffic it takes 20 minutes, provided each driver in the traffic drives nicely; however, if one of the drivers (D1) does not allow the other driver (D2) to merge into traffic safely, *i.e.* D1 does not drive nicely, D2 may be forced onto another street. Consequently, reaching the destination for D2 takes 30 minutes, whereas for D1 it takes 15 minutes due to his aggressive driving behavior. If D1 and D2 drive aggressively, there is bound to be a collision elsewhere and then traffic will eventually cause the average commute to be 25 minutes. These four scenarios can be summarized as follows:

- D1 drives nicely (20 minutes to commute); D2 drives nicely (20 minutes to commute).
- D1 drives aggressively (15 minutes to commute); D2 drives nicely (30 minutes to commute).
- D1 drives nicely (30 minutes to commute); D2 drives aggressively (15 minutes to commute).
- D1 drives aggressively (25 minutes to commute); D2 drives aggressively (25 minutes to commute).

As is well known, the Nash equilibrium for this game is that D1 and D2 drive aggressively, whereas in reality some drivers are aggressive and some are not. As mentioned earlier, expert agents tend to adhere to a social norm (*e.g.* driving nicely) unconsciously, whereas novice agents tend to make a more conscious effort in an attempt to gain as much an advantage as possible. To put it differently, a population of novice agents that are worse at adhering to social norms may exist in a state of defection more easily, *i.e.* everybody drives aggressively. Be aware that the opposite scenario, in which driving aggressively is the social norm, is as plausible as the above given scenario.

We have said that the hallmark of expert agents is adherence to social norms. Adherence to social norms by expert agents leads to stabilized outcomes. In other words, expert agents facilitate maintenance of incumbent social norms. Hence, once a norm is formed, the population adheres to it if there is a sufficient number of expert agents. This is to say that for some societies driving nicely becomes the norm, whereas in others defection, *i.e.* driving aggressively, becomes the norm. There are other examples that model interaction in traffic by using a PD game (see Levine, 2012, p. 25).

Experts follow the majority under certain conditions in line with Boyd and Richerson (1985) and Henrich and Boyd (2001). This type of behavior is a shortcut to acquiring several adaptive rules of behavior (Henrich and Boyd, 2001, p. 81). For example, following the majority may lead to cooperation under certain conditions (Henrich and Boyd, 1998, 2001; Mengel, 2009; Smith and Bell, 1994). Evolutionary game theory, as used by Maynard Smith (1982) in biology and Robert Sugden (1989) in economics, tends to overlook the fact that learning social agents cope skillfully. The formation and evolution of social norms is not only affected by rational processes, but also by unconscious processes. In this regard, the paper contributes to the literature by pointing out that the interaction of novice and expert agents can improve our understanding of the process of norm adherence.

Discussion: tacit knowing, expertise and social norms

In order to fully understand the formation of and adherence to social norms, it is necessary to move beyond the

boundaries of the rational actor model. There are several ways to learn and transmit social norms. According to Bowles (2006) and Young (2015), factors such as expected future gains, fear of punishment, and following the tendency of society may explain why individuals adhere to social norms. For example, how punishment affects norm formation is studied by Yu *et al.* (2015). Here we focused on two additional factors that explain adherence to social norms. First, implicit learning that results from persistent interactions with other agents causes novice agents to gradually develop non-representational skills and tacit knowledge over time and to eventually become expert agents. Second, adherence to social norms, which is made possible by unconscious skills and non-representational cognitive processes, helps to sustain incumbent norms in a society.

The existence of differences in behavior between expert and novice agents could be confirmed using evolutionary game theory and a heterogeneous group of interacting social agents. By incorporating the role of expert agents into the evolutionary game theory framework, the discussion of how implicit learning is related to adaptation in social environments can be improved. For such an attempt, see Aydogmus *et al.* (2015). They argue that relating the behavior of expert agents to the internalization of social norms and behaving accordingly without consciously represented rules in the mind show that the percentage of expert agents in any society is important for the maintenance of incumbent norms. Accordingly, once a social norm is formed a society adheres to it if the number of expert agents in that society reaches the necessary threshold.

According to the literature, the formation of social norms is considered a non-cooperative common interest game. The relevant theoretical game models rely on the assumption that there are no exogenous rules regarding the acceptance of social norms (Bowles, 2006). Moreover, the evolution of social norms is a common interest game, as a threshold number of norm-following agents is necessary for a norm to be accepted, and if the threshold is reached, a high-level of expected benefit is provided to society (Bowles, 2006). Nonetheless, as social norms are self-reinforcing, social agents want to follow them when they think others are doing the same (Young, 2015). In other words, although a social norm may provide a basis for beneficial social interactions, opportunistic social agents may benefit by violating it, *i.e.* the well-known free rider problem. The spread of norms that are socially beneficial, *e.g.* cooperation, is explained by group selection theory, which posits that adherence to certain social norms is beneficial to those groups that adhere to them (Boyd and Richerson, 1985; Cavalli-Sforza and Feldman, 1981).

A further research need is to determine whether an established social norm is resistant to threats by non-rule followers, which is most likely associated with the number of novice and expert agents that threaten the existing social norm. Hence, research should be conducted to determine the percentage of novice and/or expert social agents in a given society that is required to displace an incumbent social norm (for example, see Lozano *et al.*, 2008, for a stochastic model placed upon a network structure). For reference purposes, there is an extensive literature on the enforcement of cooperative norms (Henrich and Boyd, 2001; Fehr *et al.*, 2002). The present paper contributes to the literature as it is the first one to put together such disparate avenues of research on social norms and learning (novice and expert social agents) in order to examine the role of tacit knowing in adherence to social norms. The framework presented here could be generalized to the study of how several social norms emerge in the presence of heterogeneous agents.

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