

Social rules for agent systems^{*}

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1 Introduction

In the last twenty years several social rules such as conventions, norms and recently also social practices, rituals and habits have been used to model agent behaviour in multi-agent systems. The main intuition behind the use of these rules is that agents are at least partially autonomous and thus their behaviour cannot just be constrained through some hard constraints. Moreover, the social rules have not only a constraining character, but also have a motivational component in that they are part of the deliberation process. E.g. a norm to keep to the traffic rules as a bicyclist can lead to a plan to leave home early for a meeting in order to have enough time to navigate the traffic in a legal manner. The fact that the social rules have different aspects and consequences makes them difficult to implement in a uniform way as that implementation depends on what kind of internal mechanisms are available in the agents as well as in the environment. Thus different applications have concentrated on different aspects of the social rules, while most applications only use one of the social rule types.

In this paper we will discuss the different types of social rules. In particular we will look at social practices, conventions, social norms, moral norms, legal norms, rituals and habits. In a later stage we will also include the more complex social concepts such as institutions and organizations that are built in top of these social rules. See e.g. [11]. We will give a short overview of all the selected social rules in section 2. These social rules are compared in section 3 and in the last section we give some preliminary conclusions.

2 Social Rules

In this section we briefly discuss the different social rule types and indicate their main characteristics.

Social Practices come from social practice theory [3, 4, 8, 9, 10], which claims that human life is best understood as constellations of interacting persons. Within this theory, social practices are a kind of interaction pattern that can be triggered in certain contexts. As mentioned in [8, 10], a social practice consists of three parts:

- *resources*: the time, place, objects, and *actors* used in the practice

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- *activities*: the (type of) actions involved and their ordering
- *meaning*: the social interpretations that are linked with the social practice, such as kinship and familiarity

In [7] we have shown how a formal definition of social practices can be given geared towards its use in computer science. E.g. for activities we defined ways to specify plan patterns and actions that will fit in them and can be used by the participants in the practice. We have insufficient space to give the complete formal description, but it is important to mention that social practices exist only through their regular execution by individuals in physical contexts. Good examples are handshakes as greetings or soccer games as played in a park by a group of friends.

Conventions are patterns of behaviour that are not connected to an intrinsic value by themselves, but that aid coordination since most people know about and follow them. The standard formalization for conventions comes from [6] and is formulated in game theory, as an equilibrium in a so called cooperation game. The utility of conventions comes from the fact that following a convention gives a simple rule to act in an interaction situation which otherwise would give no clue to what to do. E.g. if a Skype or Zoom connection breaks the convention is that the host of the meeting will try to reconnect. As one can see this rule does not promote a specific value and thus can be seen as a norm. It just is a functional way to smooth the coordination.

Norms have been studied for a long time, but so far, no unique definition or classification has been given that all people agree upon. We view norms as rules that prohibit or oblige certain situations or actions, where violation of these rules can lead to sanctions by other people or institutions. For our purposes, we use the following simplified classification:

- *Social norms* describe standard patterns of behaviour within a group of people, deviation of which is seen as wrong because it is different from what is normal.
- *Moral norms* are more individual based rules based on what people value, but do not have to be bound to specific behaviour.
- *Formal (or legal) norms* are institutionalized rules that are not enforced by the society directly, but by an appointed authority.

Norms are tied to values such as *conformity, environment and safety*.

Rituals similarly to social practices, describe interactions between people. However, unlike social practices, these interactions put little focus on the actual effect [5], but more on the social meaning. They tend to be characterized by formalism, tradition, invariance, rule-governance, (sacred) symbolism, and performance [2]. Examples are the wedding ritual, baptism and initiation for sororities.

Habits are individual behavioral rules. In fact, they are "a more or less fixed way of thinking, willing or feeling acquired through previous repetition of a mental experience" [1]. While they are individual, they can be used to anticipate others' behaviour, and can in that way aid in planning for coordination.

3 Comparison of social rules

Social practices can be seen as the basis of the other social rules. They are emerging patterns of interactions that are attached to the specific people practicing them. From social practices, other rules can emerge such as norms, conventions, rituals and even habits.

Conventions and habits do not have any specific social meaning associated with them. Rituals do have a specific meaning, but there the functional effect is not very important. Thus the actual actions performed in a ritual are there to recognize that the ritual is performed and the social effect is achieved. In that sense a ritual can be seen as a degenerated social practice where only a social meaning is left and no practical effect, while the plan pattern is solidified to a strict protocol. Habits can be seen as social practices that are tied to just one person.

Beside the above points, social practices are more situated and bound to specific situations and contexts than the other rules. Whereas a social practice can be between two people, both conventions and norms only work if they are applied within societies, and rituals are specific to groups of people. The exception to this rule are habits, who are completely personal, and require no interaction at all.

The different social rules also have different effects. There is little social effect from conventions and habits. This is different for norms, where someone who consistently follows the norms will be seen as an upstanding member of society. This effect is even stronger for social practices and rituals, where someone that follows them is seen as promoting the attached meaning. For rituals it is even stronger, since they can make someone part of the in-group.

Violations of the various social rules also have different effects. Here, the norms tend to be a bit different from the other social rules, in that violation of a norm normally leads to sanctions, whereas for all the other social rules, violation normally either leads to discontinuation of the behaviour (habits, rituals) or to a change in the interaction (practices, conventions). The latter case is the main driver behind change in social practices.

Figure 1 visualizes the general relations between the different social rules along the two dimensions of functional/social effects and based on whether individuals can uphold the rule or groups are needed. We place habits as purely

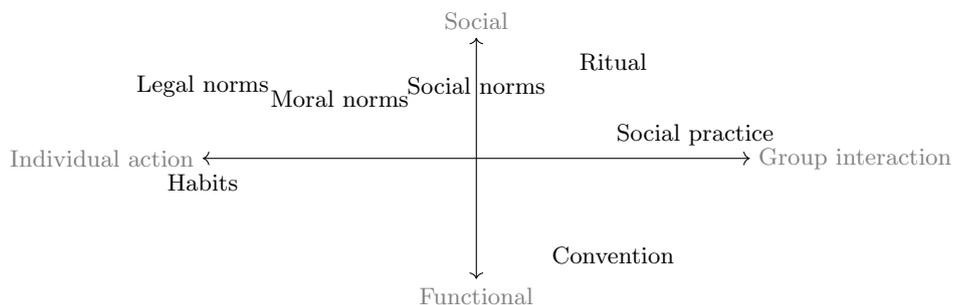


Fig. 1. Representation of relation between the discussed social rules.

individual and social practices as group interactions. While social practices have a slightly more social meaning, habits are usually more functional. On the other axis we can see rituals and conventions, they are both less individual. However they differ in the sense that rituals are very social meaning focused, while conventions are very functionally driven. Norms are for the most part in the social meaning realm, with social norms being the most social. The moral norms are more individual and legal norms are very individual. They are indeed created by a society, however upholding these norms does not depend on the group but is up to each individual. Following these norms is very individual as well as one does not need people around to abide to the law.

4 Conclusion

We discussed a number of types of social rules and compared them on a conceptual level. We created some meta theories on how the social rules could be related. Comparing their properties in terms of what is alike and what is different sharpens the initial definitions of the social rules. For example comparing social practices with habits forced us to think about whether a social practice is only social or could also be individual. We do not claim that these definitions are set in stone, this is rather a starting point for comparison and will be further defined in the future.

This work will be used as foundation for a methodology, to analyze and formalize the social rules, and for an implementation of a framework to be used for social simulations, social robotics and socially aware AI. Following up on this work, our next focus will be the context in which the rules are used, as it seems to be very important for habits, social practices and rituals to allow agents to know the context they are situated in, which allows for proper action selection.

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