



# Regulatory Artifacts: Prescribing, Constituting, Steering

Giuseppe Lorini<sup>1</sup> · Stefano Moroni<sup>2</sup> · Olimpia Giuliana Loddo<sup>1</sup>

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## Abstract

Generally, when thinking of artifacts, one imagines “technical artifacts”. Technical artifacts are those artifacts that perform a mere causal function. Their purpose is to instrumentally help and support an action, not to change behaviour. However, technical artifacts do not exhaust the set of artifacts. Alongside technical artifacts there are also artifacts that we can call “cognitive artifacts”. Cognitive artifacts are all those artifacts that operate upon information in order to improve human cognitive performances. Artifacts of a further, different kind are what we may call “regulatory artifacts”; that is, material artifacts devised and made to regulate behaviour. Consider a roundabout, a traffic light or a speed bump. These artifacts do not make us stronger, faster, or more intelligent. They are placed on the road surface to regulate traffic. This article investigates artifacts of this third kind and, especially, the functions that they perform.

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✉ Giuseppe Lorini  
lorini@unica.it

Stefano Moroni  
stefano.moroni@polimi.it

Olimpia Giuliana Loddo  
olimpia.loddo@unica.it

<sup>1</sup> Department of Law, University of Cagliari, Viale Sant’Ignazio 17, 09123 Cagliari, Italy

<sup>2</sup> Department of Architecture and Urban Studies, Polytechnic University of Milan, Via Bonardi 3, 20133 Milano, Italy

## 1 Introduction: On Various Kinds of Artifacts

Artifacts are objects expressly created to perform a certain function [1–5].<sup>1</sup> Generally, when thinking of artifacts, one imagines “technical artifacts”. Technical artifacts are those artifacts that perform a mere causal function [14]. Their purpose is to instrumentally help and support an action, not to change behaviour. Screwdrivers, hammers, nutcrackers, knives, chairs, jars, umbrellas, vacuum cleaners, fitness machines, are (in their standard usage<sup>2</sup>) artifacts of this kind.

However, technical artifacts do not exhaust the set of artifacts. As Donald Norman [15] has pointed out, alongside technical artifacts there are also artifacts that we can call “cognitive artifacts”. These are all “those artificial devices that maintain, display, or operate upon information in order to serve a representational function and that affect human cognitive performance” [15, pp. 17–38]. Compare with Heersmink [4, p. 79]: “The function of cognitive artefacts [...] is to provide task-relevant information, thereby complementing internal storage and processing systems [...] and making certain cognitive tasks easier, faster, more reliable, or possible at all”. Abacuses, calendars, clocks, calculators, computers, cameras, video and audio tape recorders, can be considered examples of cognitive artifacts (again, in their standard usage).

Artifacts of a further, different kind are what we may call “regulatory artifacts”; that is, material artifacts devised and made to regulate behaviour. Consider a roundabout, a traffic light, or a speed bump. These artifacts do not make us stronger, faster, or more intelligent. They are placed on the road surface to regulate traffic.

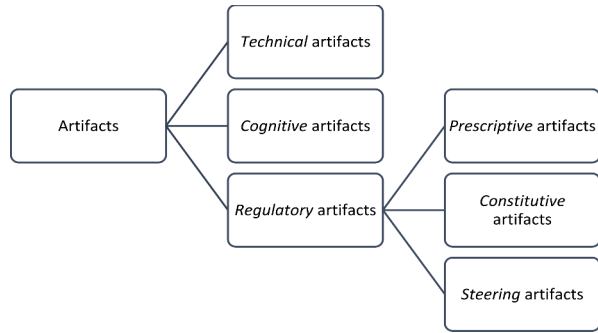
This article investigates artifacts of this third kind and, especially, the functions that they perform. The functions of technical artifacts have been studied extensively. The study of cognitive artifacts is more recent and still ongoing (starting with the works of Norman [15–17] and up to, for instance, Nemeth [18], Heersmink [3], [5], Carroll et al. [19], Sinha [20], [21]). Instead the functions of regulatory artifacts are almost entirely unexplored.

In investigating regulatory artifacts, this article is structured as follows: Sect. 2 introduces a triadic typology of regulatory artifacts based on the main regulatory functions performed by them, with empirical exemplifications of such kinds of artifacts. Section 3 discusses some crucial philosophical questions related to regulatory artifacts by examining them from three different perspectives: *symbolicity*, *deonticity*, *deicticity* (this investigation enables us to distinguish three different conceptual

<sup>1</sup> The focus here (and in the entire article) is on artifacts created by humans. For interesting studies on “animal artifacts”, see for instance [6–11]. Other studies on material objects mention animal artifacts: see, for instance, [12], [13]. It is important to point out that the studies on artifacts in the animal world clearly focus solely and typically on what we here call technical artifacts.

<sup>2</sup> That is, in line with the typical intentions of their designers and producers. This specification is important in our Introduction because: (i) here (i.e. in the case of technical artifacts) and below (i.e. in the case of cognitive and regulatory artifacts) we mention some everyday examples of artifacts only to provide a first intuitive grasp of our general discourse (in subsequent sections we will conduct more in-depth discussion of regulatory artifacts and provide further examples); (ii) the distinction among the three kinds of artifacts presented is not conceived as a rigid one (a sort of *a priori* demarcation based on features inherent to them), but as a functional one (based on the function that they perform: obviously this should be identified for each specific case). We are grateful to an anonymous reviewer for advising us to clarify this point.

**Fig. 1** A function-based typology of artifacts



pairs concerning regulatory artifacts). Section 4 concludes by highlighting the main findings in terms of the theory of *artifacts*, the theory of *normativity*, and the theory of *regulation*.

## 2 Three Types of Regulatory Artifacts

### 2.1 Prescriptive, Constitutive, Steering Artifacts

Having distinguished among three types of artifacts (technical artifacts, cognitive artifacts and regulatory artifacts),<sup>3</sup> we propose to identify three types of *regulatory* artifacts (Fig. 1) on the basis of the main *regulatory function* performed by them: (i) *prescriptive* artifacts (§ 2.1.1.); (ii) *constitutive* artifacts (§ 2.1.2.); (iii) *steering* artifacts (§ 2.1.3.).

#### 2.1.1 Prescriptive Artifacts

Prescriptive artifacts are regulatory artifacts that perform a *prescriptive function*: they prohibit or impose a certain behaviour.

A first example of a prescriptive artifact is a roundabout regulating the access and circulation of vehicles at road intersections. For example, a roundabout requires the driver entering it to move in a certain direction (anti-clockwise in the United States and clockwise in Great Britain) and prohibits him/her from proceeding in the opposite direction.

Traffic lights are a second example. Traffic lights are artifacts specifically designed to impose, through the use of coloured lights, individual rules on motorists preparing to proceed across an intersection.

Fences represent a third example. They are an elementary form of prescriptive artifacts. Fences can be used to prohibit access to certain areas for different reasons. For example, a fence can prevent access to a plot of agricultural land, to a detached

<sup>3</sup> This tripartite typology of artifacts (technical artifacts, cognitive artifacts and regulatory artifacts) is clearly not intended to be *exhaustive*. There are, for example, also “artistic artifacts” that are not included in this typology and not discussed in this article. We are again grateful to an anonymous reviewer for advising us to specify this point.

house, or to a particular area of business premises. In this case, we are talking about easily passable, but still prescriptive, barriers.

Certain kinds of regulatory buoys represent a fourth example. Consider, for example, the prescriptive function performed by specific buoys (usually rhomboidal floats made of iron or plastic) in regard to navigation by sea or by river. They are employed with a prescriptive intent when they introduce, for instance, a prohibition on sailing beyond a certain line (i.e. they act as no-trespassing buoys). Similar artifacts can be found in rivers, where they impose, for instance, the direction of navigation.

### 2.1.2 Constitutive Artifacts

Constitutive artifacts are regulatory artifacts that perform a *constitutive function*.

Carcatterra [22] distinguishes between two types of norms – prescriptive norms and constitutive norms – on the basis of the functions that they perform. Prescriptive norms perform a prescriptive function, which is to produce an event by exerting “normative pressure” on someone’s behaviour. Carcatterra distinguishes from them the constitutive norms that produce their effect immediately, doing so by themselves from the moment that they come into force.

Similarly, we can distinguish constitutive regulatory artifacts from prescriptive regulatory artifacts. Constitutive regulatory artifacts do not produce a result by exerting a “normative pressure” on a person’s behaviour (i.e. there is no one who can or must conform to some norm expressed by the artifact); instead, they produce the desired effect by themselves. Clearly, constitutive artifacts and prescriptive artifacts are also different in terms of the nature of the effects that they produce: while prescriptive artifacts can produce effects (even) in *brute* reality, constitutive artifacts can only produce *institutional* effects – that is, they can only act in the world of institutional facts [14], [23], [24].

Constitutive artifacts are, therefore, those types of regulatory artifacts that, unlike prescriptive ones, do not regulate behaviour directly. Constitutive artifacts are instead artifacts that, so to speak, “constitute” new entities [25]; they create by themselves new institutional realities that continue to exist as long as the constitutive artifact that produced them remains in place.

One could say that constitutive artifacts perform the function of rules that are a sufficient condition of what they concern: that is, in Amedeo Giovanni Conte’s [26] terminology, they are *thetic-constitutive rules*. Thetic-constitutive rules instantaneously establish or repeal an institutional state of affairs as soon as they become valid. These rules do not admit either fulfilment or violation [26–30]. Examples of thetic-constitutive rules are the abrogative rules that may be expressed by the verbal formula “Article X has been abrogated”. Other examples of thetic-constitutive rules are the decrees declaring the establishment of a hunting reserve (or, more in general, modifying the legal status of a specific area). Similarly, artifacts that perform the function of a thetic-constitutive rule create or repeal an institutional state of affairs in the place where they are installed. In this sense, to use the terminology of Czesław Znamierowski [31] we may speak of “thetic artifacts”. These constitutive (thetic) artifacts do not directly regulate behaviour by prescribing a certain conduct; but they

nevertheless exert regulatory effects by means of the “deontology” intrinsic in the new institutional entity that comes into being through them.

Examples of constitutive artifacts are demarcation stones, or rows of trees, determining the boundary of a plot of land.<sup>4</sup> In this sense, a constitutive artifact performs the same function of what Searle [32] calls a *declaration*.<sup>5</sup> We may say constitutive artifacts are three-dimensional material declarations.

Interestingly, Searle [14, p. 39] imagines that a primitive tribe builds a wall around its territory to demarcate it. In Searle’s example, the regulatory (constitutive) artifact comes into being when the *physical barrier* (the wall) becomes a *symbolic barrier*. Searle [14, p. 41] imagines “a causally functioning physical object, evolving into a symbolic object, a boundary marker”. Such a wall is a constitutive artifact because it determines – with its presence – the coming into being of a particular institutional reality; that is, a political border with a connected “deontology” (for instance, the prohibition on crossing that border by foreigners without the tribe’s permission). Note that such a boundary wall is a constitutive artifact (and not a mere “status-indicator”: [14]) only if the political boundary dissolves when the physical structure of the wall no longer exists.

### 2.1.3 Steering Artifacts

Steering artifacts are regulatory artifacts that perform a *regulatory function without a normative force*. They are “regulation-without-rules” tools [33], [34]. In other words, through such artifacts it is possible to regulate behaviour even without giving advice or imposing prescriptions. Furthermore, steering artifacts, unlike prescriptive artifacts and constitutive artifacts, regulate behaviour without an intrinsic deontology (in Searle’s sense). They do not require the existence of deontic structures (obligations, rights, claims, authorizations, commitments, etc.); nor do they presuppose deontic concepts such as the deontic modalities studied by von Wright [35].

An example of a steering artifact is a speed bump to slow traffic. A speed bump does not signal a precise speed limit; what it does is “hamper” the transit of a vehicle, “persuading” the driver, by means of its physical shape, to slow down. As Kärholm [36, p. 445] observes, a speed bump “tends to produce a lot of cars driving slowly, regardless of speed limits, road signs, or rules”.

Other examples of steering artifacts are [37]: waste paper bins designed to look like the hoops used in basketball games (giving a different meaning to the action itself of throwing rubbish in them); silhouettes installed along roads to prompt motorists to drive carefully (generally in the shape of a person, usually black in colour, positioned at the roadside on particularly hazardous stretches to signal places of fatal accidents); travellers positioned in certain airport corridors to encourage people to exploit the opportunity to move more quickly while preventing people from blocking corridors

<sup>4</sup> Also buoys can be used to “constitute” specific statuses in marine areas. For instance, buoys can be used as turn markers for sailing races. In this case, buoys constitute the perimeter of the race.

<sup>5</sup> As Searle [32, p. 541] writes: “Declarations [...] are speech acts such as for example, ‘The meeting is adjourned’ or ‘War is hereby declared’ where the illocutionary point of the speech act is to change the world in such a way that the propositional content matches the world, because the world has been changed to match the propositional content.”

(especially in groups); chicanes created to act as traffic-calming measures to decrease vehicle speed; sleep-prevention benches (i.e. benches with metal dividers – or with an uneven surface – that are unusable for any purpose other than sitting).<sup>6</sup>

## 2.2 Direction-of-Fit

The three types of regulatory artifacts also differ in terms of direction-of-fit [39–42].<sup>7</sup>

Steering artifacts have no direction-of-fit. Both prescriptive artifacts and constitutive artifacts have instead a *world-to-artifacts* direction-of-fit, but this occurs in an interestingly different way in the two cases.

Steering artifacts, because they have no direction of fit, do not admit violation or satisfaction. This also implies that it makes no sense to speak of a sanction in relation to them.<sup>8</sup>

Although prescriptive artifacts and constitutive artifacts are characterised by the same type of direction-of-fit (a world-to-artifact one), they differ in one crucial respect: whilst in the case of prescriptive artifacts it is possible that the world does not correspond to what is dictated by the artifact (in other words, it is possible to violate the prescription introduced by the artifact), in that of constitutive artifacts it is not possible that the world does not correspond to (match with) the artifact: in the case of constitutive artifacts, by means of the artifact the world is immediately modified and cannot but correspond to (match with) that artifact.

Furthermore, while prescriptive artifacts refer either to behaviours that must (or must not) be performed (*Tunsollen*) or to states of affairs that must (or must not) come into being (*Seinsollen*), constitutive artifacts cannot refer to behaviours, but only to states of things or entities.<sup>9</sup>

Therefore, unlike in the case of prescriptive artifacts, in that of constitutive artifacts there is no action/behaviour in the world that can correspond or not correspond to them. Consequently, neither satisfaction nor violation through an action/behaviour is possible. Unlike prescriptive artifacts, constitutive artifacts are not directed to recipients; as we have seen, they constitute institutional entities or states of affairs. This also implies that it makes no sense to speak of a sanction in relation to them (as in the case of steering artifacts).

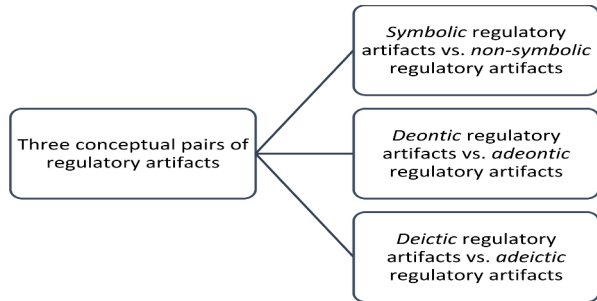
<sup>6</sup> Some of these steering artifacts exercise what Norman calls the “forcing function”; that is, a particular type of causal function (again in Searle’s [14] terminology) that determines an insurmountable and non-circumventable physical-structural constraint. Norman [38, p. 141] notes that “forcing functions are a form of physical constraint: situations in which the actions are constrained so that failure at one stage prevents the next step from happening.”

<sup>7</sup> For the critical debate on this notion, see for instance [43–46].

<sup>8</sup> Perhaps metaphorically, one could say, as Gavaghan [47, p. 125] does concerning certain steering artifacts (called “techno-regulatory mechanisms”), that they are “devices that render non-compliance practically or literally impossible”. Gavaghan speaks of devices, which, unlike rules, cannot be breached. Consider the artifacts that perform forcing functions (for example, if you do not have the ignition key of a car, it is not possible to start the engine). But literally it would be a category mistake to use the category of “compliance” to describe the effectiveness of steering artifacts (specific deontic categories would be incoherently used to describe essentially adeontic phenomena).

<sup>9</sup> On the distinction between *Tunsollen* and *Seinsollen*, see for example [48, pp. 13–14] and [49].

**Fig. 2** Three conceptual pairs concerning regulatory artifacts



From the point of view of effects, there is another difference between prescriptive artifacts and constitutive artifacts. Only prescriptive artifacts can directly affect the brute/physical world, while constitutive artifacts can immediately affect only the institutional world.

### 3 Three Issues for a Philosophical Investigation of Regulatory Artifacts: Symbolicity, Deonticity, Deicticity

In this section, we examine regulatory artifacts from three different perspectives: (i) *symbolicity* (§ 3.1.), (ii) *deonticity* (§ 3.2.), (iii) *deicticity* (§ 3.3.). The investigation of regulatory artifacts from these three perspectives enables us to distinguish three different conceptual pairs (Fig. 2).

#### 3.1 Symbolicity

First, and with regard to *symbolicity*, we can distinguish between: (i) regulatory artifacts that are symbolic artifacts: “*symbolic regulatory artifacts*” (i.e. prescriptive artifacts like traffic lights<sup>10</sup>); and (ii) regulatory artifacts that are not symbolic artifacts: “*non-symbolic regulatory artifacts*” (i.e. steering artifacts like sleep-prevention benches).<sup>11</sup>

Symbolic regulatory artifacts necessarily function as “semantic phenomena” [55]. They can perform their regulatory function thanks to the capacity that Searle calls symbolism: “the biological capacity to make something symbolise – or mean, or express – something beyond itself”. It is mainly by virtue of this capacity that, for instance, “certain sorts of sounds or marks count as words or sentences, and certain sorts of utterances count as speech acts” [14, p. 228].

These artifacts, as symbolic artifacts, are not mere parts of the physical world of being; rather, they are “parts of the human world of meaning” [56]. They presuppose the image of a human being as an *animal symbolicum*.

<sup>10</sup> Note that, in this case, the symbolic function does not imply any resemblance between the symbol and what it symbolises. A green traffic light “means” that we can continue driving. It is an arbitrary association; nothing inherent in the colour green means move ahead or keep going [50].

<sup>11</sup> On symbolic artifacts, see for instance [20] and [51–54].

Unlike symbolic regulatory artifacts, non-symbolic regulatory artifacts can also operate outside the semiotic world.<sup>12</sup> This occurs because non-symbolic regulatory artifacts do not directly exploit the symbol-interpreting capacity of their recipients in order to be effective. In other words, they do not depend on a preexisting semiotic code – and a semiotic interpretative activity on the part of the recipient – as typically happens in the case of linguistic (but also graphic) regulation.<sup>13</sup> Many steering artifacts often regulate by exercising a causal function, not through a “symbolic function” (as in the case of speed bumps or sleep-prevention benches).<sup>14</sup>

We might say that “*non-symbolic* regulatory artifacts” regulate behaviour by performing a non-symbolic function. When we speak of “non-symbolic function” (referring to Searle [14], p. 41), we mean a function that an object can perform “solely by virtue of its physical structure”, with no need for a symbolic interpretation and constitutive rules. Consider the difference between a screwdriver and a traffic light. In the case of the screwdriver, it is precisely its physical structure that enables it to perform its technical function (i.e. to tighten or remove a screw). In the case of the traffic light, its physical structure is not sufficient for it to perform its regulatory function: constitutive rules are necessary to determine the deontic meaning of the traffic light.<sup>15</sup> Given this definition of “symbolic function”, we may say that there are regulatory artifacts that are not intrinsically symbolic, like many steering artifacts.<sup>16</sup>

### 3.2 Deonticity

Second, and with regard to *deonticity*, we can distinguish between: (i) regulatory artifacts that are deontic artifacts: “*deontic* regulatory artifacts” (e.g. a roundabout); and (ii) regulatory artifacts that are not in themselves deontic artifacts: “*adeontic* regulatory artifacts” (e.g. a speed bump).<sup>17</sup>

Deontic regulatory artifacts are ones performing a symbolic function through which we normatively regulate behaviour: deontic regulatory artifacts perform a normative regulatory function. Furthermore, they entail a “deontology” in John Searle’s terms.<sup>18</sup> In order to exist, they require “deontic conceptual structures” – like the ideas

<sup>12</sup> This does not mean that the regulation that occurs through a non-symbolic regulatory artifact is necessarily also a non-conceptual regulation.

<sup>13</sup> Generally, linguistic and graphic regulation is not only a symbolic regulation but also a “propositional regulation”: that is, a regulation which implies propositional contents. On the idea of “propositional regulation”, see [57].

<sup>14</sup> Clearly, in some cases, even steering artifacts can regulate behaviour thanks to their symbolic nature. For example, when we throw a paper ball from a certain distance into a bin designed to look like a basketball hoop, the playful aspect of the gesture is obviously conditioned by the particular symbolic nature of the bin (alluding to the basketball hoop).

<sup>15</sup> Clearly, a screwdriver (e.g. one stuck in a door) could be used to indicate a prohibited area of a house. In this case the function performed by the screwdriver would not be technical but symbolic: that is, a function that cannot be performed solely by virtue of its physical structure. In this case, it is more precisely a “prescriptive regulatory function”.

<sup>16</sup> This does not mean that also steering artifacts like speed bumps or sleep-prevention benches cannot have a “communicative import” as, according to Dipert [2], all technical artifacts do.

<sup>17</sup> On the idea of deontic artifacts, see [58].

<sup>18</sup> On this aspect, see especially Searle [14] and [24].



of duty and of obligation – and “deontic entities” – like an obligation and a claim [58]. Without the concept of “ought”, it is impossible to have (and even think of) deontic artifacts. They are usually characterised by a system of rights, duties, obligations, permissions, and penalties that is inseparable from their material structure. Consider, for instance, a roundabout and the rules regarding giving way and the right to enter the roundabout. Observe that, if someone is unable to understand what a right or an obligation is, he/she cannot understand what a roundabout actually is. Matters are different in the case of a speed bump; here no “deontology” is required for it to perform its regulatory function.

Deontic regulatory artifacts often require a “deontic code” [59]. Consider the case of a regulatory artifact such as a traffic light or a road sign. Without a deontic code that enables us to grasp the meaning of the red light, the artifact does not work. Furthermore, without the deontic code, even the construction of the artifact itself would not make sense.<sup>19</sup> Adeontic regulatory artifacts, on the other hand, do not require a deontic code.

To conclude: a deontic regulatory artifact generally presupposes the “nomic capacity” and the “symbolic capacity” of (both its designers and) recipients. The recipient of a regulatory deontic artifact must necessarily be both a *nomic animal* (i.e. a rule-following animal) [14], [60–64] and an *animal symbolicum* [14], [56] (on symbolism, see Sect. 3.1. above).

### 3.3 Deicticity

Third, and with reference to *deicticity*, we can distinguish between: (i) regulatory artifacts that are deictic artifacts: “*deictic* regulatory artifacts” (e.g. a roundabout); and (ii) regulatory artifacts that are not deictic artifacts: “*non-deictic* (adeictic) regulatory artifacts” (e.g. a cocktail jigger).<sup>20</sup>

Some regulatory artifacts have a deictic nature: they are *deictic objects*. Deictic objects depend on *where* and *when* they are located in the world.<sup>21</sup>

The stop traffic sign is an example of a deictic regulatory artifact with a clear deictic character. As stated by Proskurin and Feshchenko [66, p. 325], the STOP traffic sign “not only prescribes the relevant action, but also serves as a marker of a particular stop *hic et nunc*, at the exact location of the sign”. This aspect is not connected to the kind of code (verbal or visual) of the artefact. In fact, as Proskurin and Feshchenko [66, pp. 325–326] point out, “interestingly, this sign has a different variant in Israel. Instead of the word STOP it depicts a stopping gesture of a hand”.

Deictic objects are like indexes; that is, signs which are connected or point to their material object of reference. An arrow pointing in one direction down a street is an index that performs a normative function because it prescribes the traffic direction.

<sup>19</sup> As Conte [59] writes, a deontic code is also a semiotic code in the dual sense that it is a *semiotic coding* and a *semiotic decoding code*.

<sup>20</sup> On the idea of deictic artifacts, see [65] and [66].

<sup>21</sup> For a reconstruction of the studies on deixis and indexicality see [67, pp. 315–346]. The importance of the physical location of an artifact for its semantics and its pragmatics has been stressed by the geosemiologists Scollon and Scollon [50]. According to them [50, p. 111]: “*geosemiotics* is the study of the *indexability* of the material world”. On geosemiotics see also [68] and [69].

As in the case of deictic words (such as “I”, “now”, “here”), deictic objects can be seen as semantic entities (i.e. entities with a specific meaning) that refer to a spatial portion, and whose referent is determined only in connection with the space-time coordinates of the object itself. For instance, a traffic sign “carries information referring to a certain section of a road” and, at the same time, “indicates by its geographical position the section of the road to which that information refers” [70, p. 155].<sup>22</sup> Road signs therefore have a fully defined meaning “only when the geographical positions of the sign of which they are composed are taken into consideration” [70, p. 155]. The normative meaning of traffic signs is complete only in relation to the *Origo* (i.e. the coordinate source) of the sign’s deictic field. Whilst in the case of deictic words, the *Origo* is determined by the subject-speaker (the *I*), the place (the *here*), and the moment of the utterance (the *time*) [72], for traffic signs the *Origo* of their deictic field consists of the time and place of the sign’s installation on the ground.

Furthermore, regulatory artifacts as deictic objects refer to a portion of space by means of a material contact between the artifact and its referent. It is, therefore, a particular type of reference different from that of deictic terms. In the case of *deictic regulatory artifacts*, the deictic relationship generally consists of a material association. A *deictic regulatory artifact* usually has a “symphysical field” [72]. The symphysical field is the material element – the material context – with which the artifact is materially associated. In the case of a road sign bearing the name of a place, the symphysical field is the location where this place is situated. Therefore, this road sign must obviously be situated in material continuity with that location.

By contrast, examples of *adeictic regulatory artifacts* are (mandatory) jiggers to make cocktails: these are used in order to respect the mix of ingredients in classified cocktails and/or guarantee the quantity of alcohol contained in them.

## 4 Conclusions

In this article, after distinguishing three kinds of artifacts (*technical artifacts*, *cognitive artifacts*, *regulatory artifacts*), we have investigated regulatory artifacts and presented a typology based on the three regulatory functions that they can perform: *prescriptive*, *constitutive*, *steering*. Moreover, we have analysed regulatory artifacts from three different perspectives: *deonticity*, *symbolicity*, *deicticity*.

This analysis is a contribution to (i) the theory of *artifacts*, (ii) the theory of *normativity*, and (iii) the theory of *regulation*.

Regarding the *theory of artifacts*, this study enriches the image of artifacts by showing that alongside technical artifacts and cognitive artifacts, there is at least a third type that perform a different function: regulatory artifacts. As we have seen, regulatory artifacts do not instrumentally help and support an action, nor do they affect human cognitive performance; they instead aim to influence (normatively or not) human behaviour.

Regarding the *theory of normativity*, the study of regulatory artifacts shows that the genesis of norms is more varied than is generally thought. This investigation

<sup>22</sup> For more on this issue, see [71].

enriches the classic image of normativity and, in particular, of legal normativity. If we reflect on certain normative phenomena that we encounter in our everyday lives, we discover in fact that there are rules (and deontic entities such as an obligation, a prohibition, a right, a commitment) that arise, for example, due to the presence of physical artifacts; that is, intentionally designed material objects created to normatively regulate behaviours such as road signs or traffic lights. It is therefore possible to modify the deontic world – the deontic environment – also through material objects.

Regarding the *theory of regulation*, the study of regulatory artifacts shows that regulation does not occur only through words, drawings or acts (according to the traditional image of regulation). As we have seen, a “regulatory function” can undoubtedly be performed not only by a sentence (for example, the articles of a criminal code), a drawing (the pedestrian zebra crossing),<sup>23</sup> an act (the “stop” gesture of a police officer), but also by a material object (such as a roundabout or a speed bump). Furthermore, an artifact that performs a regulatory function is not necessarily a *deontic* artifact, a normative artifact: steering artifacts are full-fledged regulatory artifacts that do not imply a deontology and that do not require deontic/normative categories. Consequently, it is necessary to supersede the orthodox view (see e.g. [23], [48], [75]) which reduces the regulatory function to the normative one (and, in particular, to the prescriptive function).<sup>24</sup> The regulatory function is broader than (and does not coincide with) the normative function: regulation is possible not only through rules/norms but in many other different ways (see [33], [34], [57]). In the present article, we have seen how behaviour can be regulated not only through norms, but also with material artifacts such as speed bumps or sleep-prevention benches, the presence of which does not alter the deontic environment: unlike traffic lights, these artifacts do not prescribe or forbid anything. There are no rules that can be violated and there is no possibility of incurring any sanction connected to them. Nevertheless, by virtue of their physical structure they discourage certain behaviours.

This consideration also affects the idea of “regulative rule”. As is well known, when Searle [23] reflects on the idea of “regulative rules”, he observes that the expression “regulative rule” seems as tautological as the expression “cold ice” (How can ice not be cold? How can a rule not be regulative?); but, in reality, it is not so, because there are also rules that are not regulative: that is, constitutive rules. To this observation we add that the expression “regulative rule” is not tautological for another reason as well: there are actually regulatory phenomena that are not in themselves normative, like steering artifacts. In short, it is possible to regulate also without rules. In his book *Law 3.0: Rules, Regulation, and Technology*, Roger Bronsword [76] describes the spread of various non-normative regulatory strategies, such as (non-normative) technological responses to regulatory needs. In other words, they are based on the design of artifacts that actually favour the fulfilment of certain behaviours (and physically prevent others) due to their design. For example, creating a central locking system in trains makes it impossible to get off a moving train and, consequently, makes unnecessary a rule that prohibits such conduct [76, p. 45].

<sup>23</sup> On graphic regulation and drawn norms, see for instance [73] and [74].

<sup>24</sup> In particular, von Wright [48, p. 7] calls the norms that express commands or permissions (issued by a norm-giver and addressed to some agent) “*prescriptions or regulations*”.

As we have seen, this point opens the way to innovative forms of regulation that not only do not require norms/rules but do not even need the deontic categories generally considered essential for the existence of the law itself (like the concepts of obligation, ban, claim, right, commitment, duty, or responsibility) and the nomic capacity of the recipient (i.e. the capacity to act in light of norms, see [77], and [64]). As already observed, regulation without norms would be possible not only in an *anomic* world (i.e. a world without norms), but also in an *adeontic* world (i.e. a world without deontic entities like obligations, rights, commitments, claims, etc.).

The broad conception of regulation proposed in this article clarifies some phenomena described in Brownsword's *Law 3.0* [76]. Indeed, some non-normative regulatory artifacts can reinforce the effectiveness of pre-existent norms, while others can prevent the violation of some norms precisely because of their physical structure. Certain non-normative regulatory artifacts make the promulgation of a norm itself completely useless, although they certainly have a regulative purpose. This approach to regulation shows a tendency to seek *technological* rather than *legal* solutions for social regulation.<sup>25</sup> Technological solutions may sometimes be very effective. Nevertheless, there is undoubtedly a crucial feature that characterizes this type of regulation: when the regulation is subtracted from the semantic dimension, the democratic control of regulation becomes more complex, and it is often excluded from the public debate and from democratic procedures for the creation of law. This point is not directly and critically considered here, but it is important to signal it. It could be a further research line to develop.

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<sup>25</sup> In line with the idea of tools that perform a forcing function (see above, note 6), Brownsword talks about "technological management" that makes obsolete, or can replace, "old duty-imposing rules". Brownsword [78, p. 4] writes: "Broadly speaking, by 'technological management' I mean the use of technologies – typically involving the design of products or places, or the automation of processes – with a view to managing certain kinds of risk by excluding (i) the possibility of certain actions which, in the absence of this strategy, might be subject only to rule regulation, or (ii) human agents who otherwise might be implicated (whether as rule-breakers or as the innocent victims of rule-breaking) in the regulated activities."

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