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Municipal regulation, smart cities and nudges: the experience of the city of Rio de Janeiro

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Abstract: This article intends to analyze the relevance of the use of nudges (regulation by pushing) in Urban Law, with emphasis on the analysis of the experience of the city of Rio de Janeiro. The main objective is to suggest the use of urban incentives in the regulation of cities, with the creation of state incentives for the behavior of economic agents that contribute to improving the quality of life in cities, making them "smart cities". The essay uses the theoretical perspective of behavioral economics, with an emphasis on nudges, especially based on the work developed by Richard Thaler and Cass Sunstein. The work follows the line of pluralism of methods and privileges the comparatist and the historical, seeking to analyze how the various legal systems and how the doctrine has been looking for alternatives to the analyzed issue. The research system must also follow the model of the hypothetical-deductive method, based on the reading of basic texts that serve as a guideline for the support and defense of our central argument. Likewise, the hypothetical inductive method will be used from the study of the particularities found in the city of Rio de Janeiro to propose general improvements in urban regulations.

Key Word: Municipal regulation – Behavioral economics – Nudges – Smart cities – Municipality of Rio de Janeiro.

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I. Introduction

The present study intends to explore the use of state regulatory strategies within the Municipalities, which seek to condition the behavior of civil society and the market, with the objective of accommodating them to the objectives sought in urban public policies, with emphasis on the experience of the Municipality of Rio de Janeiro.[1]

It is intended to verify the potential of nudges, considered small regulatory pushes that guide people's decisions, without asphyxiating their respective individual decision-making autonomy.

The nudges constitute indirect State interventions inducing social and economic behavior that are not intended to replace, but coexist with other more intense State interventions, such as the direct provision of economic activity by the State or the institution of prohibitive legal norms in the style command-sanction.

Based on low-cost experiments that respect the decision-making autonomy of individuals, nudges have been used in several countries, with some degree of success, and may represent an important strategy for implementing improvements in public policies in Brazilian municipalities.

The methodological approach used in the present study consists of the theoretical reflection of the selected references, from the primary sources, with emphasis on the theoretical perspective of behavioral economics, with special emphasis on the studies elaborated by Richard Thaler and Cass Sunstein.

The work follows the line of pluralism of methods and privileges the comparative and the historical, seeking to analyze how the different legal orders and how the doctrine has been seeking alternatives for the question analyzed.

The research systematics should also obey the model of the hypothetical-deductive method, based on the reading of basic texts that serve as a guideline for the support and defense of our central argument. However, the inductive hypothetical method will also be used from the study of the particularities found in the Municipality of Rio de Janeiro to propose general improvements in urban regulations. It is understood that the deductive and inductive methods complement each other.

Initially, the study will present the basic notions related to behavioral economics and nudges. Next, it is intended to demonstrate the possibility of using nudges within the scope of municipal regulation and its relevance for the realization of the ideas inherent in smart cities. After highlighting, in its own item, the experiences of nudges in Comparative Law, with emphasis on the United Kingdom and the United States, the study will present the embryonic initiatives in the use of nudges within the scope of the Municipality of Rio de Janeiro.

II. Behavioral regulation and nudges

In recent years, studies carried out by supporters of Behavioral Economics have contributed to the use of regulatory strategies that induce individual behavior in the attainment of public objectives. The relevance of human behavior studies justifies the statement that we are in the "age of behavioral science" (The age of behavioral science).[2]

From the critique of the rational choice of individuals in the face of scarcity and the fictional idea of Homo economicus, behavioral economics advocates the so-called bounded rationality, due to the absence of the necessary information for making more complex decisions, and assumes that individuals incur deviations in decision-making.[3]

In a seminal study on the subject published in 1974, the Israelis Amos Tversky and Daniel Kahneman, based on the perception that general rules can lead to biased or biased judgments (systematic biases), identified three heuristics or "golden rules" about the way of thinking:[4] a) anchoring (anchoring): people usually think and decide based on data and information that they previously have or that are asked in the questions (eg, people usually make greater donations when, in the question, options are placed of larger values); b) availability: people tend to analyze the risks involved in their choices based on examples they have experienced or seen (eg, someone who has experienced an earthquake usually overestimates the risk of its occurrence) or those disclosed by the press (eg, logo after a terrorist attack has occurred, frightened people will overestimate the risks of a new attack occurring); and c) representativeness: thoughts and choices based on stereotypes (eg, the high number of cancer cases in a certain neighborhood can lead to the false idea that there is a national epidemic).

According to neuroscientists and psychologists, there are two systems of thinking in people: automatic system (or system 1: fast and instinctive) and reflective system (or system 2: deliberative and conscious). From a philosophical point of view, it is tempting to prefer the "pushes" of System 2, since, supposedly, they would show greater respect for individual autonomy and dignity.[5] It turns out that it would also be possible to prefer System 1 nudges, which would probably be cheaper and more effective, in addition to promoting, to some extent, the autonomy of people who would conserve scarce cognitive resources and devote attention to their greatest concerns.

Due to the scarcity of time and the asymmetry of information, it is impossible to demand that all individual choices are reflective and take into account all variables in the decision-making context. Regulatory nudges or nudges, which will be discussed further below, are intended to facilitate the automatic choices that people make on a daily basis.

In this sense, Richard Thaler and Cass Sunstein reinforce the usefulness of state incentives for efficient decision-making based on the perception that human beings have the following characteristics:[6] a) unrealistic optimism and overconfidence, which can lead to a lack of prevention; b) aversion to loss, which generates the individual's inertia and the absence of changes, even in situations where changing behavior could bring more benefits; c) status quo bias,[7] which reveals the general tendency of individuals to maintain their current situation, which also contributes to inertia; d) framing, with the idea that decisions depend, in part, on the way problems are presented.

The State, in this context, should design the choices of individuals through the presentation of information and possible alternatives, especially in cases where there is a time lapse between the costs and benefits of the decision (e.g., encouraging the use of "clean energy" " generated by renewable and less polluting sources, with the aim of ensuring long-term environmental sustainability), decisions on infrequent issues or without feedback and situations involving information asymmetry or lack of time to evaluate the options involved.[8]

According to Thaler and Sunstein,[9] the nudge is a stimulus, a nudge, encompassing any aspect of the architecture of choices capable of changing people's behavior in a predictable way, without vetoing any option and without any significant change in their economic incentives. It's about encouraging persuasion rather than force. In other words: the nudge is not an order and preserves the freedom of choice of individuals.

In the book Nudge: Improving Decisions about Health, Wealth and Happiness, written by Richard Thaler and Cass Sunstein, the approach is anchored in two fundamental ideas: libertarian paternalism and architecture of choice.[10]

The nudge is intrinsically associated with the concept of "libertarian paternalism".[11] Public and private actors often must make choices that affect other people's choices. If the decisions of these agents do not include any form of coercion, the concept of libertarian paternalism applies, which would consist in the use of incentives to lead people to make choices that are more beneficial to them. In other words, libertarian paternalism combines freedom of choice and incentives to direct the choice to be made. This is a type of relatively weak and non-intrusive paternalism, since it does not create impediments or obstacles to people's choices.

Another fundamental idea related to the nudge is the choice architecture, which influences the decisions that individuals make without changing rewards or objective incentives.[12]

Choice architecture refers to the environment in which people make decisions. The theory developed by Richard Thaler and Cass Sunstein assumes that individuals make decisions based on contextin which they find themselves and, in general, make imperfect decisions, due to human cognitive limitations, acquired habits, incomplete perceptions, social norms, inertia, procrastination, or short-term estimates, among other reasons. Particularly in the case of complex decisions, individuals tend to choose a default option when no other signals are available.

In order to grant greater legitimacy to state action, the architecture of choice must be transparent and subject to public scrutiny, which enables not only protection of people against potentially harmful nudges, but also the possibility of social control over intentions. administrative authorities responsible for its implementation.

Robert Baldwin identifies three degrees of nudges that vary according to the impacts they have on the decision-making autonomy of individuals.[13] These degrees are not differentiated based on the tool used by the nudge, but rather on the basis of the consequences on individual freedom. Thus, a tool such as providing information can be used for first-, second-, or third-degree nudges.

"First-degree nudges" involve providing simple information to individuals or transmitting reminders (e.g. warning about the remaining deadline for filing the income tax return) and respect the individual's decision-making autonomy and improve the decision-making process. reflective decision making

"Second-degree nudges", on the other hand, have a greater impact on individual autonomy, with the creation of stimuli for decision-making by individuals with limited awareness and reflection, including through "automatic responses" (e.g. presumed consent to organ donation)

Finally, "third-degree nudges" represent a more intense intrusion than the previous nudges, since they would involve greater behavioral manipulation (eg, inclusion of pictures of sick people in cigarette packs). While "second-degree nudges" allow the receiver of the message to have the practical potential of discovering the state push and reflectively assessing its extent, "third-degree nudges" generate complete blocking (or neutralizing) of individual reflection.

According to Baldwin, nudges have been the subject of representative and ethical concerns. It is often said that there is a lack of transparency and public consideration in the state decision that implements the nudge. On the other hand, in traditional regulatory command strategies, which establish prohibitions and sanctions, state decisions are normally the result of public and open deliberation (eg participation and debate in the process of drafting a rule that intends to prohibit smoking in public places).

Sunstein seeks to rebut the aforementioned criticism by stating that nudges are normally fully transparent (eg disclosure, reminders, notices, uses of social norms). Furthermore, the idea of transparency would not be self-defined and raises doubts about the obligation of the regulator to report on the psychological mechanisms used in its regulatory strategies, as well as on the timing of disclosing said mechanisms to regulated parties. In his view, if transparency requires the Administration to expressly warn that people are going to be "pushed" or "poked" in their behavior, the public objectives pursued could fail to be achieved.[14]

Despite the criticisms and reservations presented, Baldwin maintains that nudges should not be abandoned, but should be used with precision and awareness of their limitations, including the analysis of other state intervention strategies.

Despite the paradigm shift that behavioral economics (and nudge theory) brought about in the economic and social sciences, the concept of libertarian paternalism went against the prevailing belief among economists that paternalism would be harmful no matter what form it took. which manifested. Ethical issues were also raised regarding the potential for manipulation and disrespect for the individual's autonomy. Along these lines, one critic has defined nudgeting as "the subtle design of the context of choice in order to mobilize the unconscious and alter human behavior in predictable ways".[15] In her defense, Cass Sunstein noted that nudges as regulatory tools used around the world will be considered ethical if used by governments to promote – not undermine – "well-being, autonomy and dignity".[16]

Despite the difficulty of conceptualizing the term, Sunstein states that manipulation would be an effort to influence people's choices without sufficiently involving or appealing to the capacity for reflection and deliberation. Manipulation, especially due to the lack of transparency, weakens the autonomy, dignity and well-being of people who are not placed in an adequate position to know and deliberate on certain variables and values that affect their choices. From this perspective, most nudges are not manipulative, and those that present this characteristic should be avoided and repelled.

Sunstein reinforces the defense of the use of nudges, as a valuable instrument for generating quality of life, based on two main arguments: on the one hand, the inevitability of the influence of public policies on the behavior of citizens, whatever they may be; on the other, the fact that many nudges, in fact, are instrumental in offering dignity, autonomy and well-being to citizens.

The dissemination of the central principles and ideas of behavioral economics showed how much, until then, conventional public policies adopted by governments departed from the basic assumption of rationality,

derived from the neoclassical tradition. As a result, the theory gained acceptance in several countries and supranational organizations, by showing that interventions in the behavior of citizens do not necessarily require new legislation, but can result from the simple application of nudges, or from their combination with other public policy instruments. The concept has therefore been applied in the regulatory sphere, from encouraging environmentally responsible behavior, such as conservation of water resources, recycling, urban mobility and even in the area of reducing health risks, among many others.

It is possible to argue that the implementation of behavioral regulation through nudges is closely related to experimentalism within the scope of Public Administration, especially due to the fact that the regulation strategy through incentives can be initially implemented in a controlled environment (regulatory sandbox) for evaluation of the results and eventual improvement in the strategy used, with the aim of subsequently expanding its scope of application.

Thus, non-intrusive regulation through nudges should be considered an important tool for inducing people's behavior towards the satisfaction of the public interest, but it does not, of course, prevent the use of other traditional regulatory instruments, notably the institution of prohibitions and of sanctions for situations of greater gravity and risk to fundamental rights, which cannot receive a subtle approach through simple state inducement.

In this context, the Public Administration has a box of regulatory tools (eg: setting technical standards, inspection, application of sanctions, inducing behavior) and non-regulatory (eg: direct provision of public services, implementation of public policies, exploration of activities of public relevance) that can be used to achieve the objectives outlined in the legal system, paving the way for the planned choice of the tool that reveals, in theory, greater efficiency.

In the field of municipal regulation, there is a fertile field for the use of nudges that can contribute to the social, economic and environmental sustainability of cities, as will be discussed in the following topics

III. Municipal regulation, nudges and smart cities

In this topic, we intend to demonstrate that nudges can represent an important tool for the implementation of so-called smart cities.

It is possible to identify different intensities of implementation of public policies and social behaviors necessary for the implementation of the smart city idea, which reveals the need for greater commitment from public authorities, the market and civil society so that cities can advance in the implementation of indicators of smart cities.

In this scenario, the role played by the Public Administration is fundamental, whether in the implementation of public policies and the provision of public services, or in inducing the behavior of private actors, to optimize smart cities indicators.

According to the European Commission,[17] a smart city is a place where traditional services and networks become more efficient, based on the use of digital and telecommunication technologies for the benefit of its inhabitants and for businesses. The notion includes, for example, the establishment of intelligent transport networks; improved water supply and waste disposal facility; creating more efficient ways to light and heat buildings; greater agility and interaction of the more agile and interactive Public Administration; and the safety of public spaces.

The debates around smart cities flourished with the fourth industrial revolution, started at the turn of the century and marked by the increase of new technologies, with the interaction between physical, digital and biological environments. When dealing with the relationship between the fourth industrial revolution and smart cities, Klaus Schwab maintains that "smart cities are continually expanding their technological network of sensors and working on their data platforms", with the aim of connecting technological projects with future services, which can generate positive impacts (eg: increased efficiency in the use of resources; improved quality of life; lower cost of providing services), negative impacts (eg: greater state surveillance and decreased privacy of people; greater vulnerability tocyber attacks) and unknown (eg impact on culture and perception of the city).[18]

There is not, however, a univocal definition of smart cities, but it is possible to identify the existence of indicators that have been used as parameters for the referred conceptualization.[19]

In this context, for example, ISO 37.122 – Sustainable cities and communities – indicators for smart cities, published in May 2019 by the International Organization for Standardization (ISO), which establishes the indicators to measure the progress of a smart city, stands out.

This norm consists of 80 indicators, divided into 19 thematic axes, namely:[20] a) economy: includes the analysis of the percentage of contracts for the provision of municipal services that contain an open data policy (transparent, responsible and accessible government); the survival rate of new businesses; the percentage of the workforce employed in occupations in the information and communication technology (ICT) sector, education, and research and development sectors; b) education: evaluates the percentage of the city's population with

professional proficiency in more than one language; the number of computers, laptops, tablets or other digital learning devices available to students; the number of higher education degrees in science, technology, engineering and mathematics; c) energy: considers, for example, the percentage of electrical and thermal energy produced from the treatment of wastewater, solid waste and other waste treatment; the percentage of city electricity that is produced from decentralized electricity production systems; the percentage of street lighting managed by a light performance management system; the percentage of buildings in the city with smart energy meters; the number of electric vehicle charging stations per registered electric vehicle; d) environment and climate change: investigates the number of buildings constructed or remodeled in accordance with green building principles; the number of remote real-time air quality monitoring stations; the number of public buildings equipped to monitor indoor air quality; e) finance: identifies the annual amount of revenue collected from the sharing economy; the number of payments to the city made electronically;f) governance: verifies the annual number of online visits to the municipal open data portal; the amount of city services that are accessible and can be ordered online; the average response time to queries made by the city's non-emergency query system; the average downtime of the city's IT infrastructure; g) health: analyzes the percentage of the city's population with a unified online health file accessible to the health care provider; the annual number of medical consultations performed remotely; the percentage of the city's population with access to real-time public alert systems for air and water quality alerts; h) housing: examines the number of households with smart energy and water meters; i) population and social conditions: observes the number of public buildings accessible to people with special needs; the percentage of the municipal budget allocated to the provision of aids, devices and mobility technologies for citizens with special needs; the number of signposted pedestrian crossings equipped with accessible pedestrian signs; the budget forecast for programs that seek to reduce the digital divide; j) recreation: detect public recreation services that can be booked online; k) security: identifies areas of the city covered by digital surveillance cameras; l) solid waste: confirms the existence of waste delivery centers (containers) equipped with telemetry; the percentage of the population that has door-to-door garbage collection with individual monitoring of the amount of household garbage; the total amount of waste in the city that is used to generate energy; the amount of plastic waste recycled in the city; the number of sensor-enabled public trash bins that monitor public waste; the percentage of the city's e-waste that is recycled; m) Sport and Culture: checks the amount of online reservations of cultural equipment; the cultural records of the city that were digitized; of books and e-books from the public library; active users of public libraries; n) telecommunication: identifies the percentage of the population.

Other indicators for characterizing the smart city can be found in the IESE Cities in Motion Index 2020 (CIMI), which is a research platform created by the IESE Business School Center responsible for creating a worldwide network of specialists in cities and private companies specializing in public administrations. with the aim of developing innovative ideas and tools that can generate smarter cities.

The CIMI takes into account nine fundamental indicators (or dimensions) for the implementation of a smart city, namely:[21] a) human capital: comprises attracting and retaining talent, improving education, promoting creativity and research, including using the Human Development Index (HDI); b) social cohesion: assesses the level of coexistence between groups of people with different incomes, cultures, ages and professions who live in the city; c) economy: covers aspects that promote territorial economic development, such as the local economy, the development of plans, the transition of plans and strategic industrial plans focused on innovation and business initiatives; d) governance: analyzes the effectiveness, quality and orientation of state intervention, based on factors such as the level of public participation and the capacity of authorities to involve business leaders and local stakeholders; e) environment: reveals concern with sustainable development, notably the environmental sustainability of cities, which depends on the adoption of various measures, such as the preparation of anti-pollution plans, support for green buildings and the use of alternative energy methods, in addition to the efficient use of water, solid waste management and public policies that help contain climate change; f) mobility and transport: concern with facilitating movement and access to public services; g) urban planning: planning focused on creating compact and connected cities with accessible public services; h) international reach: cities need to be concerned with the global impact through strategic tourism plans, attraction of foreign investment and representation abroad; and i) technology: considered the backbone for a city to be considered "smart", the use of technology involves, for example, the provision of internet and cell phones, in addition to increasing technology in the provision and monitoring of state services (eg monitoring and distribution of care in public hospitals according to available beds; distance learning tools in public schools; surveillance cameras that assist in the exercise of state police power).

In the ranking presented at CIMI 2020, the three smartest cities in the world, with their respective scores, are: 1°) London (100); 2°) New York (95.73); and 3rd) Paris (85.50). As for Brazil, the cities with the best performance were São Paulo (position 123), Rio de Janeiro (position 132) and Brasília (position 135).[22]

It's also important to mention the ranking the ranking presented by "Connected Smart Cities" for qualifying the smartest Brazilian cities, which is made up of 75 indicators in 11 thematic axes: mobility,

urbanism, environment, technology and innovation, entrepreneurship, education, health, security, energy, governance and economics.[23]

In the "Ranking Connected Smart Cities 2021", all 677 municipalities with more than 50,000 inhabitants in the country were mapped, in the form of the IBGE population estimate in 2019, with the aim of presenting the smartest cities. The first three places were occupied, respectively, by the cities of São Paulo, Florianópolis and Curitiba.

The city of Rio de Janeiro occupies the seventh overall position in the aforementioned ranking, presenting, on the one hand, excellent results in the indicators "technology and innovation" (first position) and "entrepreneurship" (second position), but, on the other hand, results deficient, for example, in the indicators "environment" and (seventy-third position) and "governance" (sixty-first position).

As highlighted in the previous topic, the State must use different strategies for the efficient implementation of public policies, highlighting the usefulness of the nudge as an important instrument for effecting the public interest. In this context, the State must design the choices of individuals through the presentation of information and possible alternatives, especially in cases where there is a time lapse between the costs and benefits of the decision (e.g., encouraging the use of "clean energy" generated by renewable and less polluting sources, with the aim of ensuring long-term environmental sustainability), decisions on infrequent issues or without feedback and situations involving information asymmetry or lack of time to evaluate the options involved.

The use of the nudge regulation strategy can serve as an important tool for cities to advance in improving the indicators necessary for the characterization of smart cities. Several examples of nudges can be cited, such as: a) the institution of the cap-and-trade system to reduce pollution, with authorization for companies that pollute below the ceiling allowed by law, to sell their emission rights; b) insertion of information about damage to health in cigarette packs or alcoholic beverage containers, with the aim of reducing the consumption of said products; c) creation of seals for companies that adopt certain standards of environmental sustainability, with the increase of their reputation in the community; d) availability of the amount of calories in the products of fast food chains; to raise consumer awareness and inhibit excessive calorie intake in the fight against obesity, etc.

In addition to the aforementioned ways, it is also possible to identify specific methods of implementing nudges together with technology in order to optimize people's lives and implement the concepts of a smart city.

As previously discussed, the term "smart city" refers to the idea of sustainable development and the use of information technologies in order to improve the quality of life of citizens. Sofia Ranchordás adds that smart cities also focus on the development of spaces where citizens can make better decisions that are at the same time ecologically sustainable, overcoming their cognitive biases and their limited rationality, which in a way is consistent with the same ideals of nudge.[24]

In this regard, cities considered smart are able to use new technologies such as artificial intelligence, internet of things, big data and blockchain in order to collect real-time data from citizens and the city, in order to understand the behavior of residents by region and so on. create individualized nudges, with the aim of changing specific behaviors and thus optimizing the citizen's daily life, as well as guiding them to habits consistent with the dimensions of a smart city.

By processing the data collected in real time, the Public Administration is able to carry out a predictive analysis and adapt its services to meet the needs of the city (e.g., identify areas where there is more theft and thus allocate more police to prevent the occurrence of crimes).

IV. Experiences in Comparative Law: United Kingdom and United States

Nudges have been used in several countries, including the institution, in many cases, of specific bodies or units of action.

In 2010, the UK, in a pioneering way, established the "Behavioural Insights Team" (BIT), also known as "The Nudge Unit". Initially part of the UK Cabinet Office, BIT has, since 2021, become wholly owned by the innovation charity "Nesta".[25]

Led by David Halpern and with offices located in several countries, BIT aims to help governments and private entities based on behavioral insights (nudge) that can improve public policies and public services.

A relevant example of the use of the nudge in the United Kingdom occurs in the pension system. According to the Report prepared by the British government ("Automatic enrollment opt out rates: findings from research with large employers"),[26] the reforms that took place in 2008 and 2011 in the Pensions Act, which intended to increase private pension savings in the United Kingdom, began to provide, as of October 2012, the automatic enrollment of eligible workers in the retirement regime, with the option to withdraw from the plan (opt out) in the first month. The results of the survey reveal that participation in the pension scheme, after the aforementioned legislative reforms, increased from 61% to 83%.

Another example refers to the tests carried out by BIT with the Tax Department of the United Kingdom (HM Revenue & Customs – HMRC), which sought to improve performance in tax collection, making it easier for individuals to pay. Starting with a simple change that directed recipients of the dunning letter directly to the specific form they were required to fill out, rather than the web page that included the form, raised response rates from 19% to 23%.[27]

In 2014, the United States created the "Social and Behavioral Sciences Team" (SBST), a subcommittee of the White House National Council on Science and Technology. On September 15, 2015, President Barack Obama issued an Executive Order directing federal government agencies to apply insights from behavioral science in their programs.[28]

It is true that the use of behavioral science in the United States could already be perceived before the institution of the SBST. Cass Sunstein was appointed by President Barack Obama as Administrator of the White House Office of Information and Regulatory Affairs (OIRA), inserted in the Office of Management and Budget (OMB), where he served from 2009 to 2012, including using insights from Behavioral Economics to improve the cost-effectiveness of regulation.

Mention should be made of the project to combat childhood obesity. Introduced in the 1990s and used for decades, the Food Pyramid, created by the federal government's Department of Agriculture, was used to promote healthy eating. The pyramid figure indicated that a person should eat more (healthy) foods from the bottom of the pyramid and less food and drink from the top of the pyramid. Starting from the base and rising towards the top: breads, cereals, pasta and rice; fruits and vegetables; dairy products; eggs, fish, vegetables, meat and poultry; in addition to alcohol, fats and sugars.[29]

Several criticisms were launched for the format of the Food Pyramid, due to the difficulty in understanding it, such as: confusion when indicating less healthy foods at the top, when common sense indicates that the top of the pyramid would normally indicate a place of conquest and of overcoming; the image of less healthy foods, at the top, does not accurately represent a type of food; the base of the pyramid indicates several foods and does not make it clear whether they should be consumed at once; etc.

In 2011, the pyramid figure was replaced by the figure of a plate of food, with clearer indications of the proportion of food (fruits, vegetables, grains and proteins).[30]

In Cass Sunstein's view, governments should be marked by simplification, with the reduction of complexity. In this context, replacing the Food Pyramid with the plate of food represented an excellent nudge initiative that avoided ambiguity and was specific about the preferred path.[31]

The use of nudges and other behavioral economics tools has been noticed in several countries. According to the report "Behavioural Insights in Public Policy: Lessons from Around the World" published by the Organization for Economic Cooperation and Development (OECD), in 2017, 23 countries apply behavioral insights.[32]

In a study on the use of nudges in Europe, Lucia A. Reisch and Cass R. Sunstein surveyed six European countries (Denmark, France, Germany, Hungary, Italy and the United Kingdom), selected to represent different cultural and geographic regions, as well as different socioeconomic regimes and political traditions of that continent.[33]

In that study, the investigated interventions were disclosed in five groups: a) government campaigns to educate people about childhood obesity, distracted driving, smoking and overeating; b) mandatory information, imposed by the government on the private sector, requiring disclosure of the nutritional value and health risks of foods (eg: calorie labels, high salt content, nutritional traffic lights); c) Mandatory default rules, imposed by the government on the private sector, involving green energy provision, carbon emissions taxes and Red Cross donations, along with mandatory choice architecture for retailers to support healthy food, and active choice in organ donation; d) mandatory subliminal advertising imposed by the government on movie theaters to discourage people from smoking and overeating; e) mandatory choice architecture involving supermarkets (e.g. areas of the supermarket with healthy products) and also choice editing that goes beyond mere "pushes" (e.g. meatless days in public cafeterias).

The authors found that the six countries surveyed support nudges, but citizens reject "nudges" that offend against two principles that would require consensus: a) the government should not take people's money without their explicit consent; and b) the government must not manipulate people (at least, in the case of subliminal advertising). However, a notable division between nations was found: in Denmark and Hungary, the majority support the nudge, but have significantly lower levels of receptivity compared to citizens of France, Germany, Italy and the United Kingdom. The study also revealed a curiosity: the lack of consistent and clear associations between party affiliations and approval or disapproval of nudges.

The study also revealed that citizens of six nations reject nudges that offend two principles that require consensus: a) the government should not take money from people without their explicit consent and b) the government should not manipulate people. Despite general European consensus, the study found lower levels of

support for nudges in Hungary and Denmark. While in Hungary, the finding was explained by low levels of trust in the government, levels of support in Denmark did not get an explanation from the study authors.

In the United States, Cass Sunstein developed an important national survey, administered by Survey Sampling International, which involved thirty-four nudges, with a margin of error of plus or minus 4.1%. In the end, two important conclusions were found: a) Americans reject nudges that promote what they consider to be illegitimate ends (eg religious or political favoritism); and b) Americans reject nudges that are considered inconsistent with the interests and values of the majority of respondents.[34]

The research encompassed, for example, three nudges that were implemented in the United States and revealed wide popular acceptance, namely: a) mandatory calorie labels in restaurant chains (87% approval); b) Mandatory graphic warnings on cigarette packages (74% approval); and c) automatic enrollment in savings plans, subject to voluntary exclusion (80% and 71% approved, respectively, the incentive and the obligation of automatic enrollment plans).

On the other hand, the survey detected unpopular nudges, with broad disapproval from Americans, including measures of dubious constitutionality, such as: a) a certain state assumes that people want to register as Democrats, unless people explicitly express their intention to register as Republicans or independents (74% disapproval); b) state law that assumes that people are Christians, for census purposes, unless they indicate otherwise (79% disapproval); c) state law establishing, in heterosexual marriages, that husbands will automatically replace their surname to adopt the surname of their respective wives, unless they express opposition (76% disapproval); d) the federal government assumes, in their income tax returns, that people want to donate US$50 to the Red Cross and Society for the Protection of Animals, unless people expressly state that they do not wish to make this donation (73% disapproval , in the case of the Red Cross, and 74% of disapproval, in relation to the Society for the Protection of Animals); e) the newly elected president adopts an educational campaign with the aim of convincing people that criticism of presidential decisions is unpatriotic and potentially harmful to national security (77% disapproval); f) educational campaign by the federal government seeks to convince mothers to stay at home to take care of young children (67% disapproval); g) federal government campaign intends to require that all products from a communist country be sold with the label "Made in whole or in part under communism" (56% disapproval); etc.

According to Sunstein, the rejection of some nudges, considered unpopular, can be justified based on two principles: a) nudges that have illegitimate objectives; and b) nudges inconsistent with most people's interests and values. The research revealed that party affiliation (Democrats and Republicans) can influence the support or rejection of nudges, due to the disagreement with the legality of certain "nudges" and consistency with people's interests and values. In some cases, Republicans are more skeptical than Democrats (e.g., calorie labels and campaigns against childhood obesity), and in other cases, the reverse is true, with Democrats being more skeptical of Republicans (e.g., anti-abortion nudges).

As already highlighted, in behavioral science, there are two forms of cognitive operations: a) System 1, which is fast, automatic and intuitive; and b) System 2, which is slow, calculating and deliberative. Apparently, nudges aimed at System 2 (conscious deliberation) would be better than those aimed at System 1 (subconscious bias), due to the possibility of greater reflection by people and not seeming like state manipulation. However, there are indications that System 1 related nudges gain strength when people realize their need to neutralize a self-control problem. In a survey carried out by Sunstein with three hundred people on the "Amazon Mechanical Turk", System 2, with the presentation of information about the risks of smoking, was more popular in the anti-smoking campaign. However, when informed about the greater effectiveness of System 1 "nudges" regarding the implementation of objectives (less smokers, in this case), most changed their minds and preferred this type of nudge, with the presentation of graphs and photos. of people with cancer.[35]

At the end of the research, Sunstein presents five conclusions:[36] a) there is broad transnational support for nudges in democratic societies; b) support decreases when people distrust the motivations of the "choice architect" or are afraid that inertia or lack of attention will lead to effects inconsistent with their values and interests; c) there is apparently greater support for nudges targeting System 2, but there may be wide approval for those related to System 1, especially if they are intended to combat self-control issues; d) people's assessment of nudges in general can be greatly affected by the political valence of the particular nudges they have in mind (or that are brought to their mind); and e) transparency about nudges should not, in general, reduce their effectiveness, either because most are already transparent, or because people do not generally rebel against them.

Based on the experiences already implemented in several cities, it is possible to verify the relevance of behavioral regulation, notably the increase in nudges for the implementation of Smart Cities.

V. Nudges in the Municipality of Rio de Janeiro

The choice of the Municipality of Rio de Janeiro as a research parameter stems not only from the relevance of the city, but especially because the Municipality, in a pioneering way, created "NudgeRio", in 2018, within the scope of the João Goulart Foundation Institute, with the mission of disseminating the concept and carrying out Applied Behavioral Science projects.[37]

NudgeRio is the first nudge unit within the scope of Brazilian Public Administration and aims to contribute to the process of elaborating projects and municipal public policies, based on behavioral incentives so that citizens have better access to public services.

It should be noted, however, that the Municipality of Rio de Janeiro has already conducted projects with nudge since 2014 through the "Carioca Leaders Program", especially with the Transversal Work Groups - GTTs, which are committees formed by Carioca Leaders to meet specific demands, generated by a specific public body.

In this context, due to the queues at the Regional Education Coordinations – CREs – for enrolling in public schools, an experiment was implemented in 2016 based on the use of e-mails with nudges to increase online enrollments on the Municipal Secretariat website of Education.[38]

Despite the possibility of enrolling over the internet and the existence of centers for enrolling people who do not have access to the internet, a large part of the population still seeks the school unit to try to enroll their children.

For students who already study in the municipal network and who do not intend to change units, enrollment is carried out automatically. As for new students and students who intend to transfer between school units, it is necessary to complete the online enrollment, which is divided into two moments: a) in the first moment, the person in charge can choose up to five schools to enroll their children; and b) in the second moment, the person in charge will have only one choice of school unit for future allocation, in addition to the school units with idle spaces.

After identifying those responsible for the students listed in the Municipal Education Secretariat's database, adapting the enrollment website, which became more intuitive, and identifying the difficulties in the online enrollment process, emails were sent to those responsible to highlight the first moment of registration online.

The team responsible for the project divided the database into four parts, three for treatment (responsible for receiving e-mails) and one for control (responsible for not receiving any messages about online registration). As for the treatment groups, alongside a standard science text from the online enrollment period, three different text compositions were developed highlighting different heuristics:

a) group 1 (Facility and Reciprocity) – message: "Try it! Click on the link above or copy and paste it into your browser toolbar!";

b) group 2 (Facility and Scarcity/Competition) – message: "Through the website, you have the same options of schools and you don't have to queue at the Education Coordinations! Remember that while you are in line to enroll your child, other people have already completed the enrollment in less time and with much more comfort over the internet."; and

c) group 3 (Facility and Social Norm) – message: "Did you know that more and more people enroll their children in Rio de Janeiro City Hall Schools through the website? In 2015 there were more than 130 thousand people. This year, we estimate that many more will enroll via www.matricula.rio, making it easier and saving time. Don't stay out of this and use the site to enroll your child!".

In the year in which the aforementioned project was implemented, online enrollments at the first moment of registration increased from 91,844 to 169,483. All treatment groups performed better than the control group, which did not receive an email reminder of the online enrollment process. Within the scope of the treatment groups, the best result was obtained from the group that received an email with the heuristic "Facility and Reciprocity".

Some projects developed based on NudgeRio's contribution corroborate the relevance of nudge in improving municipal management, as exemplified below.

The "GTT Travessia + Legal" project, carried out in 2018 based on a demand from the Companhia de Engenharia de Tráfego-CET-Rio, aimed to reduce the rate of road accidents and was integrated into the Rio City Hall's tactical urbanism project, called "RIO + Pedestre", which also took place in 2018 around the São Francisco Xavier subway station, in the Tijuca neighborhood.[39]

The implemented actions intended to demonstrate the importance of reducing the speed of vehicles by repositioning the curbs and the angles of the curves in the perception of drivers, with the installation of temporary furniture, new pedestrian crossings, landscaping elements and removable signage to increase pedestrian safety and comfort.

Based on the premise that the conventional horizontal signaling of a crosswalk would not be enough to convince pedestrians to take the safest route when crossing the street, the first experiment implemented a wider crosswalk with a red background, different of the other colors used in the "RIO + Pedestre" action, with the idea

of referring to the image of a "red carpet" so that the "pedestrian king" would feel motivated to cross the crossing. The second experiment, in turn, implemented a vertical signage on one side of the road to discourage pedestrians from crossing outside the crosswalk.

It was verified at the end of the project that the experiments showed a reduction of unwanted movements (crossing outside the crosswalk with a red background) by up to 30%, in periods of greater pedestrian volume.

In 2021, NudgeRio conducted an experiment to encourage the payment of traffic fines by defaulting drivers.[40]

By sending e-mail messages containing nudges to a treatment group formed by defaulters registered on the Carioca Digital website of the Rio de Janeiro City Hall, positive and negative stimuli were presented to induce feelings of urgency regarding the payment of the fine

At the end of the experiment, it was found that the discharge of fines in the aforementioned treatment group was 8.27%, while the discharge rate in the other group, which did not receive messages with nudges, was 2.63%.

From the experiences implemented by the NudgeRio team within the Municipality of Rio de Janeiro, it is possible to note that the institution of specific units in Brazilian Municipalities for the use of nudges, in a planned and controlled manner, can represent an important strategy for improving policies public utilities and the implementation of smart cities.

VI. Conclusion

It is possible to verify that the use of nudges in the scope of municipal regulation represents a relevant strategy, inserted in the menu of regulatory and non-regulatory strategies, for the conditioning of social and economic behaviors, with the aim of improving the quality of urban public policies.

Considered an inductive regulatory intervention of social and economic behavior, which preserves the autonomy of regulated agents, does not have a coercive character, encourages experimentation and involves low economic cost, the nudge should be used with primacy in relation to other state intervention strategies, notably the direct provision of economic activity by the State or the elaboration of prohibitive legal norms in the command-sanction style.

Despite the intensification of the use of nudges in comparative law, with emphasis on the experiences in the United States and the United Kingdom, their implementation in the Brazilian legal system is still quite embryonic, especially if we consider the institution of state units dedicated to the theme and with planned action.

The experience presented by NudgeRio in the Municipality of Rio de Janeiro can serve as an inspiration for the dissemination of nudge units in other entities of the Federation, especially within the scope of Municipalities that intend to be qualified as smart cities.

It is not a case of defending that nudges represent a regulatory strategy capable of solving all the complex challenges faced by Public Administration, but rather of considering that nudges are a low-cost regulatory option that reduces information asymmetry in public-public relations. private and enables more informed decision-making by regulated agents, in line with the public interest.

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