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Nudging and educating: bounded axiological rationality in behavioral insights

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Abstract: While it is broadly accepted that individuals are boundedly rational, the meaning of these boundaries and what to do about them has generated a debate between two different views: one that defends *nudging* as the best possible way to improve the outcome of people's decision and one that criticizes their use. This debate occurs at an instrumental level, conceiving decisions under a goal-oriented perspective. I propose that adding the role of values (axiological rationality) to the discussion can shed new light, not only on this debate, but also on nudges themselves, clarifying and enriching some arguments in the discussion about autonomy and efficiency. This approach will not only be more comprehensive, but it will also increase the effectiveness of nudges by tackling the different components of our rationality. Nudges should not only be goal-oriented; they should also be educational. Non-educational nudges should be used in conjunction with educational interventions. I will illustrate my position with two examples: vaccination policies and nudges in the use of seatbelts.

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Introduction

Standard economics presupposed a vision of rationality far from reality where individuals, possessing infinite capability to calculate, were able to maximize their decision-making to obtain the best outcome. Herbert Simon's empiricism (Hortal, 2017) criticized the insufficient realism of this approach, claiming that people behave with bounded rationality (Simon, 1982), satisficing instead of maximizing. Amartya Sen's notion of 'rational fools' (Sen, 1977) described

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in similar terms the limitations of the standard theory of rationality. To provide a more realistic description of the decision processes in economic and organization theory, Simon used the insights of psychology, which in part led to a behavioral revolution in the social sciences. Amos Tversky and Daniel Kahneman (Tversky & Kahneman, 1974), also at the genesis of this movement, researched people's heuristics and biases, arguing that when deciding rationally, people fail to do so in a consistent and systematic manner. Richard Thaler and Cass Sunstein (Thaler & Sunstein, 2009), departing from the idea that humans predictably err, developed a practical policy-making theory centered on changes in the choice architecture within which individuals decide. Nudge theory, continuing the steps of the heuristics and biases research program, proposes that we can exploit these systematic errors to our benefit: we can 'nudge' individuals to achieve better outcomes (as judged by themselves) in their decisions by altering the choice architecture within which they have to decide. The goal, therefore, is to increase the welfare of citizens by influencing their decision-making.

While social scientists accept that people's rationality is bounded, what this means and how to deal with it in policy-making has generated a debate between two different views: libertarian paternalism, which defends the use of nudges as the best possible way to improve the outcomes of people's decisions without limiting their freedom; and a view that criticizes their use, advocating for an educational perspective (or specific impositions when needed). The first view rests on the assumptions of the heuristics and biases research program; the second view is based on the ecological rationality of Gerd Gigerenzer and some evolutionary psychologists like Leda Cosmides and John Tooby. In line with this approach, Till Grüne-Yanoff and Ralph Hertwig (2016) claim that the use of educational 'boosts' can be an efficient, non-coercive intervention to deploy in order to increase the agency of individuals when deciding. The main criticism of nudges rests on the idea that they are an inefficient policy strategy (Gigerenzer, 2015) based on an inaccurate, 'pessimistic' (Samuels *et al.*, 2002; Polonioli, 2012, 2016a) view of our rationality that may backfire, causing unwanted results.

This rationality debate occurs at an instrumental level, conceiving of decisions within a goal-oriented perspective. In this paper, I aim to show that adding the role of values (axiological rationality) to the discussion can shed new light on this debate and on nudges themselves, clarifying and enriching some arguments in the discussion about autonomy and efficiency. I claim that individuals are not only boundedly rational agents, but also that they exhibit axiological rationality (Weber, 1978). Their values, therefore, are an essential part of their decisions: people have reasons for doing what they do, as Raymond Boudon (2003) asserted.

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The following pages will be devoted to make the case for an inclusion of axiological components in behavioral insights. Policy-makers who use nudging should consider not only a change in behavior, but also, in certain cases, an understanding of the value components of individuals. Nudges, therefore, should be used as a complement to boosts or deeper educational purposes that take into consideration axiological rationality. This approach will not only be more comprehensive, but will also increase the effectiveness of nudges, since they will tackle the different components of our rationality.

The two perspectives

Once researchers tried to provide a more realistic approach to describe how we decide, it became clear that our rationality was bounded by several factors. This view is shared by all of the above-mentioned authors: Herbert Simon, Amos Tversky, Daniel Kahneman, Gerd Gigerenzer, Richard Thaler and Cass Sunstein. They all claim that our rationality falls short of the ideal prescribed by classical and neoclassical economists. That they all categorize our rationality as bounded does not imply that they all share the same type of perspective on this matter. Some authors divide these perspectives into 'pessimistic' and 'optimistic', as is the case of Richard Samuels (Samuels *et al.*, 2002). Following this line of thought, Andrea Polonioli (2012) posits that while Kahneman, Tversky and nudge theory present a pessimistic view of our rationality, Gigerenzer and some within the school of evolutionary psychology defend a more optimistic approach. The difference is based on how rationality is perceived. Gigerenzer and evolutionary psychologists accuse nudge theorists and those behind the heuristics and biases research program of describing our behavior as merely irrational. This irrationality, they claim, may represent some evolutionary advantage that had to be matched to a specific environment in order to be efficient. Biases do not separate us from effective decisions; they are rational shortcuts that we can apply to our decision processes in a specific environment to increase our efficiency (Polonioli, 2012, p. 136). From a similar perspective, Grüne-Yanoff and Hertwig embrace the idea that the use of boosts instead of nudges can increase the competences of individuals. While nudges limit themselves to behavioral changes, boosts target competences (Hertwig & Grüne-Yanoff, 2017, p. 977), skills and knowledge by enlisting human cognition, the environment or both. They are built under the assumption that our rationality, while bounded, is not divided into system 1 (fast, emotional) and system 2 (slow, deliberative, rational). Instead, our cognition is malleable. Boosts, they claim (Hertwig & Grüne-Yanoff, 2017, p. 974), require the active cooperation of individuals. Accordingly, Hertwig (2017) does not see boosts as being better than nudges. In a way, boosts are efficient tools that,

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in some scenarios, are preferable to nudges, but in other scenarios are not. While different, Hertwig defends the use of both boosts and nudges. Those differences are important, and they clarify the view of rationality that all of these approaches have:

> Boosts thus differ from nudges in terms of the underlying assumptions about the potential value of educative efforts, the emphasis placed on the importance of actually exercising the power of choice (as opposed to being afforded the opportunity to choose), the levers used in the intervention … and the underlying understanding of human decision-making (Hertwig, 2017, p. 146).

The ecological rationality approach, by contrast, criticizes the use of nudges, since they fail to prove that people are impossible to educate (Gigerenzer, 2015). Facing the choice of educating them or nudging, governments and institutions should wish to do the former. Using ecological rationality may lead one to change the environment and how information is presented so that they match the cognition of an individual, or it may address human cognition itself: "The true alternative to nudging is education: making children and adults risk savvy" (Gigerenzer, 2015, p. 375). According to this perspective, nudging without education is a way to infantilize citizens.

Boosts and ecological rationality propose similar approaches, since both highlight the importance of educating citizens so that they can exercise their own agency. Since boosts are an educational resource, they are placed on the side of ecological rationality. Nudges are changes in the choice architecture, and some of them can also be educational. In this paper, following the notion of adaptive rationality and the authors included under that umbrella proposed by Polonioli (2016b), Gigerenzer's view and the boosts proposed by Hertwig and Grüne-Yanoff will be considered under the educational perspective:

> Those in favour of nudges typically invoke the findings of Kahneman and Tversky's heuristics and biases research programme … emphasising decision-makers' systematic cognitive biases and motivational shortcomings. Those in favour of boosts typically invoke findings showing that bounds on people's time, knowledge and computational powers do not prevent them from making good decisions, to the extent that they succeed in employing simple decision strategies in the appropriate contexts – that is, where there is a fit between cognition and environment (i.e. ecological rationality) (Hertwig, 2017, p. 146).

While those proposing boosts consider them to be an intervention that, despite sharing some similarities with nudges, is essentially different, others (Sims &

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Müller, 2018) claim that they may be referring to the same types of mechanisms if we look at them under a normative perspective.

A closer analysis of both perspectives (nudges and educational tools) unveils essential similarities: exploiting our rational limitations to increase the efficiency of our decisions by altering the environment is like claiming that determined heuristics are advantageous in certain environments, or that we may boost the competences of people by presenting probabilities and percentages in natural frequencies. The difference, I argue here, is related to a philosophical view of the nature of rationality more than a difference in how rationality works. I share Richard Samuels' idea that the distinction between both perspectives is only apparent (Samuels *et al.*, 2002).

While they both are based on a similar approach to bounded rationality, Gigerenzer argues that the heuristics and biases research program poses a vision of human decision-making as irrational. He claims that these irrationalities are advantages instead of errors:

> Visual illusions help us to understand how our brains work: Our brains have insufficient information about the world. Intelligence means going beyond the information given and making informed bets on what's outside. By making bets, every intelligent system makes 'good' errors … Making such 'errors' is not a flaw; without them we wouldn't recognize the objects around us. If a system does not make errors, it is not intelligent (Gigerenzer, 2014, p. 47).

The differences between both views become even clearer when referring to visual illusions. Kahneman divides metaphorically our thinking processes into two systems: one intuitive and automatic, and the other deliberative and rational. Kahneman proposes that these illusions are systematic errors made by system 1, since this system operates automatically and cannot be turned off. These errors are difficult to prevent and biases cannot always be avoided (Kahneman, 2011, p. 25). These illusions seem to be an example of cognitive illusions. Gigerenzer, on the other hand, argues that those errors are an essential part of our rationality: they are good errors and they cannot be considered as flaws: "Without them we wouldn't recognize the objects around us. If a system does not make errors, it is not intelligent. Visual illusions in fact demonstrate the success rather than the failure of cognition" (Gigerenzer, 2014, p. 47).

Gigerenzer criticizes the division of systems employed by Kahneman, claiming that intuition (system 1 in Kahneman's metaphor) is not opposed to rationality:

> Intuition is unconscious intelligence based on personal experience and smart rules of thumb. You need both intuition and reasoning to be rational. …

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> Deliberate thinking and logic is not generally better than intuition, or vice versa. Logic (or statistics) is best for dealing with known risks, while good intuitions and rules of thumb are indispensable in an uncertain world (Gigerenzer, 2014, pp. 123–124).

Although Kahneman talks about systematic errors, he does not contradict this thesis – both systems must interact for an efficient thinking process. He posits that this collaboration between systems can be very practical since "it minimizes effort and optimizes performance" (Kahneman, 2011, p. 25). But this type of collaboration is far from the malleability of our cognition necessarily proposed by the proponents of adaptive ecological rationality (Sims & Müller, 2018, p. 21).

Kahneman does not mention that education is impossible. System 2 can provide vigilance regarding the visual illusions of system 1. We can learn about these illusions and follow the more deliberative system 2. We can be educated and resist illusions after recognizing them. "Errors can be prevented only by the enhanced monitoring and effortful activity of system 2. As a way to live your life, however, continuous vigilance is not necessarily good" (Kahneman, 2011, p. 25). Kahneman believes that although education is possible, it may not be a good thing to try to monitor system 1 errors or cognitive illusions. We can learn how to "recognize situations in which mistakes are likely" (Kahneman, 2011, p. 25). Those authors who advocate for the use of boosts also criticize the hypothesis of the two systems, arguing that our cognition is malleable (Sims & Müller, 2018, p. 21). The notion of the two different systems is also questioned by Matteo Colombo (2018), who posits that recent research shows that there are neurological pathways that connect both systems.

The libertarian paternalism of nudges uses this view of rationality as a point of departure to develop a theory in order to make our lives easier. After providing some examples of visual and cognitive illusions, Kahneman claims that the "message of those examples is not encouraging" (Kahneman, 2011, p. 25). Since it is not practical to be constantly vigilant for possible errors made by system 1, nudges provide an efficient mechanism that may increase the efficiency of our decisions.

Gigerenzer proposes that people do not have to be at the mercy of institutions or other people in order to avoid having to monitor system 2 for possible errors. Those institutions and the people in them are also agents with bounded rationality, conflicted interests and illusions that may affect how they nudge. He asserts that people have to learn how to think on their own (agency) and take responsibility for their decisions. People can learn about risks and

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uncertainty, and governments, instead of investing in nudge units, should invest in people's knowledge and risk literacy.

According to Andrea Polonioli (2015), Keith Stanovich criticized Gigerenzer's adaptive rationality, claiming that, according to Gigerenzer's evolutionary approach, if heuristics had the role that he and his group assign to them and they have arisen due to adaptation, then they would be more universal. According to Stanovich, this is not the case: "Stanovich's reported heterogeneity in the use of heuristics seems problematic, as one would expect the use of heuristics to be far closer to universal if adaptationist pressures had led to their use" (Polonioli, 2015, p. 57). Polonioli asserts that Stanovich's argument is not robust enough. Stanovich's argument rests on the notion that if heuristics arose due to adaptation, they would not be heterogeneous. Polonioli thinks that this is false: "[A]n adaptationist framework might account for heterogeneity in the use of heuristics" (Polonioli, 2015, p. 57).

There is another criticism that Stanovich presents against Gigerenzer's adaptive rationality that Polonioli addresses: the case that people with higher cognitive ability follow normative rationality. This might compromise Gigerenzer's ecological view and the role of heuristics. Polonioli posits that there is not enough evidence to support this view: "[P]eople who score higher at tests of cognitive abilities achieve better life outcomes because they do not reason heuristically remains at a hand-waving level and is not empirically well supported" (Polonioli, 2015, p. 56).

Gigerenzer's ecological view, as mentioned above, claims that we cannot measure rationality and its heuristics and biases against the axioms of logic, but instead we must measure them against the environment in which they are deployed. Their success rests on that relationship with the environment. Following the rules of logical rationality could even have negative consequences in real-life situations. What adaptive rationality theorists have omitted, according to Polonioli, is that biases are not homogeneous. The families of biases present themselves in different ways: "What [adaptive rationality] theorists and other scholars have failed to notice or acknowledge is that biases are rather heterogeneous kinds of phenomena" (Polonioli, 2016b, p. 794).

Nudges and education

Gigerenzer's rejection of nudges and defense of education is sustained by the research he conducts, in which he and his Adaptive Behavior and Cognition (ABC) group question the validity of the arguments provided by the heuristic and biases research program. Some of their claims are based on the possible miscommunication between the experimenters and the subjects when referring to probability, and they argue that some may interpret this as plausibility

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instead. The criticism centers on the examples of the conjunction fallacy provided by Tversky and Kahneman in some of their experiments (Tversky & Kahneman, 1983) that showed that people cannot work with probabilities very well. For example, people consider the probability of 'Linda is a bank teller and an active feminist' higher than 'Linda is a bank teller'. This is clearly incorrect. Gigerenzer claims that this is due to a miscommunication between the experimenter and the subject, since the subject may be considering not the probability, but the plausibility of such an event (Gigerenzer, 2007). In those experiments, the information is presented without a context. Once content, context and representation are provided, the subjects acquire a different perspective of the event (Hertwig *et al.*, 1999, p. 276). Subjects answering questions about the probability of Linda are inferring a non-mathematical meaning for the concept 'probability' (Hertwig *et al.*, 1999, p. 293). This is what Polonioli (2012) called the 'interpretation argument'.

The work of Gigerenzer also focuses on the distinction between probabilities and frequencies, trying to make those cognitive illusions disappear: "[W]hen information was presented in frequency formats, statistically naive participants derived up to 50% of all inferences by Bayesian algorithms" (Gigerenzer & Hoffrage, 1995, p. 684). Gigerenzer's goal, therefore, is to educate people rather than to nudge them, by providing them with an understanding of how to cope with risk and uncertainty. According to this approach, single probability events should be reformulated by using frequency statements; natural frequencies should be used instead of conditional probabilities; and the use of relative risks should be complemented with absolute risks. In a Kantian philosophical approach, Gigerenzer (2014, p. 15) links knowledge and freedom, arguing that risk-savvy citizens must be the pillars of a free society. He believes that a type of 'risk school' would be needed in order to increase risk literacy. Allowing governments to nudge instead of educating would undermine efforts to educate and empower citizens. Nudges will facilitate the rise of citizens who are not going to think on their own, instead waiting to be nudged into doing the right thing (Gigerenzer, 2014, p. 245).

Polonioli (2012), in reference to the rationality debate between the pessimistic and the optimistic approaches, concludes that the arguments provided by Gigerenzer are not robust enough and that the momentum gained by field experiments provide stronger arguments to maintain Tversky and Kahneman's view. This reinforces the thesis of some authors (Samuels *et al.*, 2002) who maintain that the dispute is only apparent and that if we attend to the essences of both perspectives, the similarities are more relevant than the differences.

The epicenter of Gigerenzer's criticism of libertarian paternalism is found in the idea that the use of heuristics leads to biases or mistakes. An example is

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cited by Thaler and Sunstein (2009) when referring to representativeness heuristics. They argue that the use of such a heuristic process leads people to confuse random fluctuations with causal patterns. Every heuristic has a bias associated with it. According to Gigerenzer, libertarian paternalists believe that the use of heuristics leads to systematic errors in our rationality. But a deeper look at the texts by libertarian paternalists provides enough evidence to maintain that they do not think that radically; that is, heuristics usually work well for nudge theorists. According to Sunstein (2014, p. 33), these shortcuts generally work well, but sometimes they misfire. The differences between Gigerenzer and libertarian paternalists are not as deep as Gigerenzer himself thinks. In a very clarifying statement, Sunstein claims that "heuristics tend to have 'ecological rationality', in the sense that they make sense in the settings where they are usually applied" (Sunstein, 2014, p. 33). Gigerenzer would subscribe to this notion word for word. The differences stay at a policy-making level, since both perspectives would advocate for two different course of actions that respond to two philosophical views of similar events.

For Gigerenzer, nudging people is a way to treat them like children. While nudging does not present any alternatives to its proposals, Gigerenzer defends an educational approach, providing what he calls a sustainable solution. We are already nudged by corporations and governments, and it would be very difficult to compete with those nudges. According to Gigerenzer (2014, p. 256), the solution has to be different: his proposal is based on the investment in risk-savvy citizens "that can make informed decisions themselves" (Gigerenzer, 2015, p. 380). Between both positions we find what Ralph Hertwig (2017) proposes with boosts. Although he does not think that boosts are better than nudges, he does claim that boosts are a tool that may be useful in certain scenarios, since they target the competences of the individual, increasing his or her agency: "The objective of boosts is to improve people's competence to make their own choices; the focus is on interventions that make it easier for people to exercise their own agency" (Hertwig, 2017, p. 144).

The problem with nudges, according to Gigerenzer, is not only that we lack evidence of their efficiency, but they may also pose a conflict of interests for the choice architect, since he or she is the one manipulating the environment that affects the outcomes of our decisions. Gigerenzer argues against nudges per se, against their justification and against the libertarian paternalism program and its pessimistic attempt to show the hopelessness of educating people. That a benevolent choice architect is needed to engineer a nudge to steer behavior is a complicated and idealistic approach.

Instead, Gigerenzer proposes that we should be teaching about risk and uncertainty while educating experts on how to communicate about these

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topics (Gigerenzer, 2014, p. 14). We also need to teach financial literacy to ensure that people are not exploited (Gigerenzer, 2014, p. 256), as well as health statistics (Gigerenzer, 2014, p. 177), among many other things. It is important to highlight that Gigerenzer, like Hertwig, is not against a little bit of nudging, but as a general policy, he claims that "coercing and nudging people like a herd of sheep instead of making them competent is not a promising vision for democracy" (Gigerenzer, 2014, p. 261). While libertarian paternalism claims that it is very difficult to educate individuals, Gigerenzer posits something different: "the claim that we are hardly educable lacks evidence and forecloses the true alternative to nudging: teaching people to become risk savvy" (Gigerenzer, 2015, p. 361).

Nudges rest on the assumptions that we are not easily educable and that the choice architect who manipulates the environment is a benevolent agent with accurate knowledge about the future outcomes of people's decisions. Not all agents are benevolent; some nudges are evil (Thaler, 2018) and only work for the benefit of the institution or corporation that sets them. In behavioral marketing, we have examples that do not benefit the individual (small print to hide fees is a clear example of an evil nudge, 'sludge' as Thaler (2018) called them). Gigerenzer (2015) claims that there is not enough evidence regarding the first assumption and that choice architects sometimes are not free of self-interest and/or ignorance (e.g., sometimes they do not understand scientific evidence).

A note about autonomy

Autonomy is the control that agents have over their evaluations and choices. "In valuing the 'autonomy' of a person, it is not adequate to be concerned only with whether she receives what she would choose if she had the opportunity to choose; it is also important that she actually gets to choose herself" (Sen, 1997, p. 753).

The issue of autonomy in choice theory has been discussed widely by Amartya Sen and other authors. The main benefit of nudges rests on the idea that they are liberty preserving (Thaler & Sunstein, 2009, p. 5): since nudges can be resisted, they do not pose any limitations to our freedom. But others see that nudges are not as libertarian as posited. Nudges may be liberty preserving when considering the amount of choices agents have, but they can be questioned in regard to the way they may affect the autonomy of individuals by shaping those choices (Hausman & Welch, 2010).

The debate is centered on the type of influence nudges may have in our freedom and/or autonomy as previously defined. Could the manipulation of choice may be an imposition on our autonomy since we lack some of the

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control over our decisions? When a choice architect manipulates an environment, this is because he or she envisions some type of outcome from the agents. In that sense, nudges are paternalistic: they influence our behavior by organizing the choice environment.

> Libertarian paternalism is a relatively weak and non-intrusive type of paternalism, because choices are not blocked or fenced off. In its most cautious forms, libertarian paternalism imposes trivial costs on those who seek to depart from the planner's preferred option. But the approach we recommend nonetheless counts as paternalistic, because private and public planners are not trying to track people's anticipated choices, but are self-consciously attempting to move people in directions that will promote their welfare (Sunstein & Thaler, 2003, p. 1162).

Their perspective rests on the assumption that agents are not able to choose in their own interests all of the time. In order to help them to do so, nudges are used as an efficient, liberty-preserving method. Since governments and institution (choice architects) must start somewhere in organizing the environment, nudges are unavoidable (Sunstein & Thaler, 2003, p. 1165).

Other authors (Barton & Grüne-Yanoff, 2015) have dismissed that claim, arguing that there are scenarios where neutrality can be achieved in the choice environment with education, training or better design.

Libertarian paternalists' argument rests on the unavoidable nature of manipulation of the choice environment, instead providing an instrumental approach to the arrangement of choices. They manipulate it to improve the outcome of agents' decisions as judged by themselves. But this is also problematic, according to some authors, as our act of choice cannot be considered as a statement subject to consistency (Sen, 1993). When nudges are introduced, it is assumed that we are being inconsistent with our welfare or with our previous or future selves.

Nudges are efficient because those who implement them understand those limitations and the role of the environment in our decisions. Accordingly, this type of paternalism cannot be avoided, since the environment in which agents decide will always influence their decision. Governments, agencies, institutions, cafeterias, etc., must always present their information and choices in a specific way. Doing so without limiting the choices and with the intention of increasing the chances that agents will act in a way that may be beneficial for them is at the heart of nudges. This impossibility of avoiding paternalism becomes clearer when those institutions have to present some type of default option or rules. In some scenarios, it is even more beneficial for the individual and even more liberty preserving when the choice of not having to choose (a default) is presented.

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Nudge theory rejects any type of paternalism that is not libertarian. This rejection rests on the idea that freedom of choice should be a part of the decision-making process. Preserving choices is an essential part of it. But sometimes having more choices does not mean a greater degree of freedom (Sen, 2002, p. 606). The objections are based on the argument that if certain choices are objectively bad for agents, why have them? The answer provided by libertarian paternalists rests on the argument that freedom of choice has intrinsic value, which it is better to have.

The other argument against nudges considers them as radically affecting our autonomy if they are not based on rational influence: "Their freedom, in the sense of what alternatives can be chosen, is virtually unaffected, but when this 'pushing' does not take the form of rational persuasion, their autonomy – the extent to which they have control over their own evaluations and deliberation – is diminished" (Hausman & Welch, 2010, p. 128). The argument regarding autonomy essentially posits that nudges represent a challenge to our autonomy because they affect our behavior through bypassing our reason. Some nudges take advantage of non-rational elements in our decision-making processes (Wilkinson, 2012), so in order to preserve autonomy, only rational influence should be accepted. Against that position, some (Grüne-Yanoff & Hertwig, 2016) argue that nudges may even allow individuals to fully express their autonomy, since they seek to affect people's behavior in order to make them better off as judged by themselves: "[M]uch nudging is also required on ethical grounds, in part because some nudges actually promote autonomy, in part because some nudges enable people to devote their limited time and attention to their most important concerns" (Sunstein, 2015a, p. 413).

Nudges per se do not respect autonomy, nor do they not represent a challenge to it – it all depends on the type of nudges and how they are applied. In order to have autonomy, informed choices are needed, and there are nudges that respect and enhance that type of information. This is where the distinctions between boosts and nudges become blurred. It looks like there is an intersection of the two, where the same interventions can be considered nudges or boosts depending on who is proposing them. An educational nudge resembles the characteristics of a boost, or even part of what is proposed by ecological rationality. Nudges are not here to remove autonomy. According to Sunstein (2015a, p. 438), if nudges improve biased decisions, they help to promote autonomy.

One of the most important aspects governments and institutions must take into consideration while trying to respect the autonomy of individuals is transparency. These institutions should try to inform those they are trying to nudge that they are in fact seeking to alter their behavior. Libertarian paternalists'

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policies have to be open and clear about their intentions: "[P]ublicity is important. One important way to protect against abuse and to respect autonomy is to make sure that the government actually inform people of efforts to shape their choices" (Hausman & Welch, 2010, p. 135).

The fact of the matter is that there are transparent nudges and non-transparent nudges. A transparent nudge would give information about its intentions and how the intervention would be implemented. A non-transparent nudge hides all of that information from the individual subject to the nudge (Hansen & Jespersen, 2013).

The issue regarding transparency is crucial to understand in relation to the ways in which individuals' autonomy can be affected by nudges. Most authors claim that transparency should be a requirement for nudges. Individuals should be aware of any type of intervention that is destined to modify the choice environment of their behavior, and through that, their actual behavioral outcomes. According to Luc Bovens (2009), although transparency may affect the effectiveness of nudges, this does not mean that nudges are not manipulative: "It should be noticed right away that Bovens' claim that epistemic transparency is in conflict with the efficacy of nudging is not a direct claim as to nudging being psychological manipulation" (Hansen & Jespersen, 2013, p. 19). On the other hand, there are authors who challenge such a perspective, arguing that transparency may not affect nudges at all: "The empirical part is that nudges often or always work best, or only work at all, when they are covert – i.e. when nudgees do not know they are being nudged. Claims to this effect are typically unsubstantiated" (Grill, 2014, p. 155).

According to Till Grüne-Yanoff (2012), nudges are non-transparent manipulations that limit people's degree of liberty based on non-transparent, supposed biases. Martin Lodge and Kai Wegrich (2016) also claim that nudges are, in essence, non-transparent tools. But according to Sunstein, some of these objections are not accurate. There are nudges that are clearly transparent, like default rules and disclosure policies (Sunstein, 2013).

Choice architects should always aim for transparency in order to preserve autonomy and to eliminate any ethical complaints or objections: "Some nudges are objectionable because the choice architect has illicit ends. When the ends are legitimate, and when nudges are fully transparent and subject to public scrutiny, a convincing ethical objection is less likely to be available" (Sunstein, 2015b, p. 1). Sunstein asserts that transparency should be a safeguard for nudges. If nudges are liberty preserving, this is due to the fact that individuals can choose not to follow them. In order to respect this and to allow nudges to be non-irresistible, they have to be transparent (Barton & Grüne-Yanoff, 2015).

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Nudges and values

Instrumental rationality is the default theory of rationality (Nozick, 1993, p. 133). Although there are different frames that can be used to talk about rationality, the means–end schema is the most widely used in the academic literature. Against that narrow view, Raymond Boudon (1998a) claimed that we are also rational because we have reasons to believe in a specific thing or to act in a specific manner, sometimes because we have strong reasons to believe it is the right thing to do, regardless of the consequences. Considering rationality merely within an instrumental frame, Boudon posits, will impede our ability to explain certain aspects of our rational decisions that cannot be categorized within a means–end schema. People sometimes behave not according to the consequences of their behavior, but according to the principles or values they hold:

> The theory of ordinary rationality I propose to derive from Weber's work rests finally upon a basic principle I propose to call the *cognitive equilibrium principle*. It says that people believe that X is true, acceptable, good, legitimate, etc. as soon as they have the feeling that X rests upon a set of acceptable reasons (Boudon, 2012, p. 18, emphasis in original).

His definition is very similar to the one provided by Amartya Sen: "Rationality of choice, in this view, is primarily a matter of basing our choices – explicitly or by implication – on reasoning that we can reflectively sustain if we subject them to critical scrutiny" (Sen, 2009, p. 180).

Some consider that Boudon introduced a notion of rationality that was parallel to the one drawn by Gigerenzer, and that very similar criticisms can be considered: "Whilst, to the best of my knowledge, Boudon and Gigerenzer do not cite each other, their conceptions of human rationality are in fact strikingly similar" (Manzo, 2014, p. 534). According to Boudon, Tversky and Kahneman's description of biases is close to a 'black box' (Boudon, 1998b), or as Gigerenzer sees them, as mere labels that are too vague to be robust explanations of our decision-making processes (Gigerenzer, 1996, pp. 593–594).

I do consider that Gigerenzer's approach also remains at an instrumental level. His program, while providing normative insights into how to behave in order to be more efficient, fails to explain how rationality works from an evolutionary perspective. According to Gianluca Manzo (2014), Boudon's 'ordinary rationality' is very similar to Gigerenzer's ecological approach. In my view, Manzo sees in Gigerenzer something that is barely there. Gigerenzer's ecological approach is basically an instrumental explanation of our decisions. The role of values is absent in his theories.

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Matteo Colombo, although taking a different perspective, also considers that the ecological approach is instrumental and attends to goals. He contraposes it to the constructivist view of rationality, a distinction used by Vernon Smith (2008). According to Colombo, this constructivist view uses norms (axiomatic) as a way to measure its success. The ecological approach, Colombo proceeds, focuses on its connection with the environment, and it attends to goals. Using Dennett's distinction between personal (intentions, beliefs, desires) and subpersonal (networks in the brain) levels of explanation (Dennett, 1969), Colombo claims that ecological rationality is associated with the subpersonal level of explanation, since this connects behavior to the environment (de Pinedo-Garcia & Noble, 2008), while the constructivist view is personal. Although both Smith and Gigerenzer use the term 'ecological' and they both cite Herbert Simon as the foundation of their theories, they refer to two different models (Dekker & Remic, 2018). It is important to clarify that although we are dealing with two distinctions (personal–subpersonal/axiomatic–ecological), these pairs are independent of each other. The pair of concepts 'personal and subpersonal rationality' does not imply the other pair 'axiomatic and ecological rationality'.

Our behavior, Boudon explains, is not only instrumental; we also show cognitive and axiological reasons for our behavior. We possess an expressive (axiological) rationality that gives sense to the world – that makes the world intelligible to us (Álvarez, 1992, p. 82). This type of rational theory might shed some light, for example, on the reasons why we vote when it is not instrumentally rational. Boudon eliminates the 'black boxes' that other theories assume when they lack an explanation for what people do. Those black boxes are an example of Tversky and Kahneman's heuristics and biases (verbal labels, according to Gigerenzer). Boudon, critical of the heuristics and biases research program, maintains that we cannot interpret those biases as causes, and nor can we characterize our behavior as irrational when it is biased in Tversky and Kahneman's view. Boudon focuses on the reasons as to why individuals have erroneous beliefs, but this is not irrationality. He defends a rationalistic view of error instead of the irrational (pessimistic) one (Demeulenaere, 2014).

We have beliefs, according to Boudon, and those beliefs are sometimes the reasons behind our decisions. We have 'personal' reasons to do what we do. In a way, this notion resembles Dennett's distinction. When we understand the reasons underlying our behavior by attending to beliefs, this is a way to introduce a horizontal explanation (Drayson, 2012). According to this approach, while the personal level of explanation is horizontal, the subpersonal level is vertical. It is this personal view that is similar to Boudon's reasons.

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Boudon refers to beliefs, for example, as a way to understand the reasons why people act in a certain way:

> [W]hen we explain a person's behaviour, we cite the sequence of mental events that preceded the behaviour, primarily in terms of propositional attitudes such as the person's beliefs and desires. Horizontal psychological explanation of this sort is our default method of accounting for the actions of other people, and is often termed 'personal' explanation (Drayson, 2012, p. 3).

As mentioned above, Colombo (2018) sees the personal level of explanation as part of the constructivist view of rationality, subject to norms and axioms. The subpersonal level would be closer to an ecological view, following Vernon Smith's distinction (2008), and it would attend to goals.

Reducing all of our decisions to an instrumental perspective produces the appearance of those black boxes Boudon criticizes. Behaving in a purely egotistic and instrumental way would make us the type of rational fool that was described by Sen (1977).

Since we have reasons to do what we do, are nudges a way to manipulate those reasons and to steer our behavior to a mere instrument that would satisfy our goals? Are nudges a way to remove our axiological rationality or are they an instrument to preserve it? These would be difficult questions to answer because of their breadth and because there are many different types of nudge: default rules, information nudges, etc. In my opinion, there is still research to do on the distinction between nudges, boosts and the ecologically rational interventions that aim to educate. The answer provided by libertarian paternalists is that it is impossible to remove nudges since the choice architect will always have to decide upon an environment in which individuals must decide: "[M]anipulation is unavoidable; no matter how options are presented, they frame our choices and behavior" (Roeser, 2012, p. 1037).

Let us consider a hypothetical scenario: recycling. Let us suppose that an individual does not recycle because there is a cost (effort) in separating all of the materials, organizing them and having an extra container to store them in her small kitchen. On the one hand, she has reasons for doing what she does. On the other hand, she also thinks that environmental issues are important and we should limit the damage humans cause to the environment. She has instrumental reasons for not recycling and values that push her to do so. It is obvious that a society would benefit if nudges were used to increase the amount of materials that are recycled, especially if the individuals involved agree that recycling should be done. According to this perspective, a nudge that might facilitate recycling should be desired, since it would reduce the cost of individuals trying to separate materials for recycling.

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Some nudges do change our values. Companies that manufacture high-fructose corn syrup have tried to change its name to 'corn sugar' in order to manipulate the perspectives that individuals have about their product and its chemistry. 'Corn sugar' sounds like a natural product, while 'high-fructose corn syrup' sounds like a chemical product. The Food and Drug Administration sent a letter requesting companies to cease their use of the term 'corn sugar' in reference to this product. Changing its name could have been considered a nudge that would have altered the values of consumers in regard to this product.

The case is similar with labels referring to trash as 'landfill'. This label might cause people to change their cognitive rationality since they would be receiving information that also impacts their emotions regarding where their trash will go.

I claim that the issue rests on the relationship between the different aspects of rationality. Sometimes, rationally explaining how things work in an attempt to alter people's cognitive rationality is not enough or does not work at all. This is the premise of nudge theory: education sometimes does not work:

> There is a great deal of evidence that giving people strong arguments to change their minds often fail to work when people are motivated to reject the evidence. In fact, those who are motivated to reject the claims may become more entrenched in their views than previously. This is known as the backfire effect (Levy, 2017, p. 495).

Considering issues related to vaccination, we may find people with reasons to believe that vaccination is dangerous. Following Boudon's argument, if they do not get vaccinated, they have cognitive reasons for this course of action. Their behavior is not irrational; their actions are based on 'personal' beliefs. The argument, within the rationality debate, is whether they should be educated, nudged or forced to receive those vaccines. In a sense, while all alternatives would try to change people's actions, not all try to change their cognitive rationality. Rejecting the use of vaccines, from an instrumental perspective, might be viewed as irrational, but not from Boudon's perspective. These people may be ignorant, or maybe they are showing some type of risk aversion that does not allow them to see the benefits of vaccines.

Understanding the reasons why people behave in a specific way, or at least accepting the idea that people may have reasons to do what they do, can shed some light on what type of policy-making technique we should use to change their behavior towards accepting something as objectively beneficial as vaccines without limiting their autonomy. Some have argued that bypassing people's autonomy should be accepted with regard to vaccines:

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> At least in the case of pediatric vaccination, some autonomy-undermining nudges may be morally justified. This is because parental autonomy in pediatric decision-making is not as morally valuable as the autonomy of adult patients, and because the interests of both the vaccinated child and other members of the community can sometimes be weighty enough to justify autonomy-infringing pediatric vaccination nudges (Navin, 2017, p. 43).

Even if specific nudges affect the autonomy of individuals, this perspective would defend their use due to the objective benefit of vaccines. That is the argument made by Emily Oster and Geoffrey Kocks (2018) in their *New York Times* article about vaccination and measles. Data show that more people got vaccinated and the risk of measles was lowered in California after an outbreak in 2014 when laws were stricter. But what is controversial is their following idea: "From a policy standpoint, these findings offer a ray of hope for vaccine proponents. Maybe changing minds isn't so important. People may not have altered their attitudes about vaccination, but the fact is that these laws actually changed behavior" (Oster & Kocks, 2018).

The use of nudges responds to the impossibility of educating people about certain behaviors and the idea that a choice is better than a mandate. A view that includes axiological components might try to help us understand the reasons why some people reject the use of vaccines without relying on the black box of irrational behavior or the dismissal of why people do what they do. Accordingly, from a public policy perspective, the goal should not only be for people to do what is right (instrumental), but also to understand and value what is right (cognitive and axiological rationality). Having a monistic view of rationality that rests just on instrumental principles affects the type of policies to implement.

Nudges should not be rejected, but the theory of rationality on which they rest should include an axiological component. This broader view of our rationality includes not only an instrumental means–end schema, but also an axiological angle, in line with what was proposed by Javier Echeverría and J. Francisco Álvarez (2008). Both elements of rationality act in a "single communicative situation" (Echeverría & Álvarez, 2008, p. 175). Since the instrumental and axiological approaches constitute the fabric of our rational processes, neglecting one or the other would generate problems when trying to account for the way people decide. A narrow version of rationality based merely on instrumental principles would not be able to explain certain phenomena within our decisions. A broader notion that incorporates axiological principles would provide explanations about behavior that otherwise might seem irrational, generating the 'black boxes' Boudon was criticizing.

I claim that the libertarian paternalist perspective that advocates for the use of nudges in policy-making, although effective, rests on a narrow version of

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rationality that cannot account for specific behaviors, which can only be explained by attending to axiological principles. A complete policy-making approach should consider not only the outcome, but also the process itself. Sometimes, when individuals act in a specific way, they have reasons for doing so. It is important that any type of policy-making approach takes people's expressive rationality into consideration when trying to influence their behavior. Nudges, when needed, should tackle both aspects of rationality, not only the instrumental one. If people's cognitive axiological rationality (in Boudon's terms) is based on false predicaments, policy-makers should try to change not only the outcome of people's behavior, but also their axiological rationality.

Nudges are an efficient tool and I do not think they should be rejected. There are educational nudges that help people understand more about their choices. The obnoxious beep that our cars produce when we are not wearing a seatbelt is an example of a nudge that is efficient and serves as a reminder of what to do. Supplementing that with an educational perspective that might help us to understand how seatbelts are beneficial would be a comprehensive approach, since it would consider both aspects of our rational behavior while assuming a realistic view: people are boundedly rational.

Since individuals show two versions of rationality (instrumental and axiological), it is important that both elements are considered by public policy-makers and governing bodies when trying the benefit their citizens. To this end, nudges should have an educative component.

Take, for example, the use of seatbelts. The Centers for Disease Control and Prevention (CDC) of the government of the USA has a campaign to increase the use of seatbelts among drivers. They use the appropriate educational tools in regard to risk and accidents to influence our cognitive axiological rationality. But nudges are also able to alter our instrumental rationality:

- Cars use beeping sounds to remind us about the use of seatbelts.
- Advertising campaigns use catchy phrases such as 'Click it or ticket'.
- On the roads, there are reminders of the use of seatbelts that are clear and precise: 'Buckle up, it is the law'.

According to the CDC (n.d.), in 1981, only 11% of drivers used seatbelts in the USA; by 2010, that number had increased to 85% of all drivers. Drivers today are not only changing the outcomes of their decisions; they also understand, from an axiological cognitive perspective, the benefits of wearing a seatbelt in a car.

Regulations, public policies and nudges regarding safety have always had the possibility of backfiring, and sometimes they may cause an opposite effect to the one desired. Regulations proposed in the auto industry regarding seatbelts

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in the 1960s did not cause any decrease in death rates. Sam Peltzman's (1975) research proved that safety regulations provided safety benefits, but they also increased the risks taken by drivers, therefore offsetting the effects of the regulation (Peltzman, 1975, p. 717). The term used to define this type of case is 'risk compensation'. It is something that can be seen in the use of helmets while riding bicycles (Adams & Hillman, 2001).

This introduces a factor to consider when implementing policies (educational, regulatory or in the form of nudges), since there is always the possibility of an offset through a change of behavior of the people targeted by the policies, either by risk compensation or by other unforeseen effects. For example, nudges used to decrease electricity use by comparing usage with neighbors may be effective for those households that are politically liberal, but it may not work for those on the other side of the political spectrum (Costa & Kahn, 2013). These 'rebound effects' happen with different policies. Dual-flushing toilets, for example, may increase water consumption instead of reducing it, since in some cases they may be flushed more times.

The rebound effect may be caused by bad design of the nudge. It is also possible that their effects may be ephemeral. But that policies may not provide the desired consequences is something that policy-makers must consider. Providing educational nudges or boosting (Grüne-Yanoff & Hertwig, 2016; Hertwig & Grüne-Yanoff, 2017) competences might eliminate the complex ethical issues that might appear if regulation or nudging backfires.

If governments as policy-makers attend only to the instrumental aspect of rationality, they would be neglecting part of their function in a democratic society, which is to educate people in order for them to be autonomous in their decisions. This can only be done by understanding the rationality of their citizens in a comprehensive manner: not only from an instrumental view, but also from a bounded axiological rationality perspective. We are boundedly rational individuals who also exhibit axiological rationality (Echeverría & Álvarez, 2008, p. 173). It is because we exhibit axiological rationality that educative nudges should complement the instrumental ones.

But there cannot be a liberty-preserving nudge if individuals lack the understanding of and do not share the values (axiological) upon which that decision is based. Values here are an important filter; as Echeverría and Álvarez claim, they "orient our perception … The subject selects what he desires and rejects in the environment, the subject valuates the information" (2008, p. 179).

In addition to the above-mentioned claims, not all nudges are for our benefit. In this paper, I have only referred to nudges that try to make life better for individuals, neglecting nudges that may try to do the opposite. Since our world has evil nudges – Thaler's (2018) 'sludges' – and since it is desired to have citizens who are able to escape the effects of sludges, we can only hope for informed

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and educated (competence-related) citizens capable of recognizing these sludges and escape their effects. Who is providing this information? Who is educating citizens to prevent them from falling into sludges? My approach, stemming from claims that nudges can only be used in tandem with educational interventions, can provide a solution to the problem. Public policy-makers must educate individuals in order to prevent the negative effects of sludges.

Conclusion

The inclusion of the axiological element should be the basis for any type of theory of rationality or public policy that tries to target people's decisions. It is not enough, from an efficient and an ethical angle, to simply alter people's behavior. If that was case, all axiological components would be neglected. Since we are not 'rational fools', nudges must go beyond the instrumental approach of non-educative nudges that only look for behavioral change. Nudges should be educational, or they should work in parallel with educational interventions of any kind. That is, if they are merely instrumental and only try to manipulate the outcome of our behavior, then that is because there has been a previous or parallel attempt to educate people about that specific decision.

In the example of seatbelts, policies that are created by governmental agencies should not only be focused on making sure that people wear them; they should also invest in education and educational nudges in order to affect all of the components of rationality. Understanding how seatbelts save lives at a cognitive level makes individuals grasp the importance of their use as a value. That value motivates decisions, but since our rationality is bounded, instrumental nudges can be a great resource for modifying our behavior to comply with what we really want (i.e., wearing seatbelts, since we understand that doing so saves lives in case of accidents).

If schools want to decrease the amount of junk food consumed by students, they should also be tackling rationality in a comprehensive approach. Using the example of the nudge described by Thaler and Sunstein (2009), it is not enough (as we see the role of government agencies) to just alter the behavior of students by placing the salad or vegetables at eye level in the cafeteria and placing the pizza on the top shelf. A more comprehensive approach should be demanded, one that might also educate students.

Unfortunately, in our society, we do not only have good nudges; we also suffer the consequences of sludges. Consequently, citizens should be prepared to face these sludges with the weapons that only skillful competence, values and cognitive rationality can provide. Since we cannot always count on a

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benevolent choice architect, we should learn how to identify nudges, accept them if they are beneficial and oppose them if they are not.

According to the view of rationality of Tversky and Kahneman first and Thaler and Sunstein later, these types of attempts to educate people to make rational choices sometimes do not work. This does not mean that we should not try to find ways to make them work. We should not reject the use of nudges either. To this end, a more comprehensive view of our bounded rationality is required – one that has a double approach when designing policies: an instrumental and an axiological one.

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