

Behaviorally Informed Vaccination Policies: Political Transparency as an Ethical Condition and Effective Strategy

*Stefano Calboli**
stefano.calboli@uniurb.it

Vincenzo Fano†
vincenzo.fano@uniurb.it

ABSTRACT

SARS-CoV-2 vaccines are indispensable allies in the fight against COVID-19. Behavioral and cognitive (B&C) scientists argue for taking advantage of results from their fields of investigation to shape anti-COVID policies. B&C scientists extensively discussed the methodological and practical issues that arise in translating B&C research results into policy interventions aimed to boost vaccination. Nevertheless, they neglected to ethical aspects involved. In the present work, we discuss the ethics of nudging vaccination in light of the “alien control” objection, a kind of control whereby an agent has the power to influence the choice of another agent, and the latter cannot control such power. We proceed as follows. We begin by presenting several cases of mandatory policies available to policymakers to boost the vaccine rate (§1). Next, we point out how the results from B&C sciences can inform policies and open up ways to enhance them (§2). In section 3, we focus on untraditional policy tools, viz. nudges. We move on to introducing the debate on the ethics of nudges, focusing on the “alien control” objection and its relevance for the citizens’ freedom and autonomy (§4). In section 5, we discuss the original point of the paper. We argue that, referring to nudging vaccination, a somehow neglected ethical issue posed by nudging emerges. Our point is that nudges do not exclusively exert an influence over the targeted behavior. Indeed, nudges also impose a political influence, by which policymakers treat citizens as *means* to succeed in achieving peculiar and potentially controversial political *aims*. We argue that citizens can hardly detect the nudges’ political influence due to what we propose to call the political multi-justifiability of nudges. This leads to the threat of alien control. In the last section, we draw some provisional conclusions, we suggest a possible solution and its practical advantages.

* University of Urbino Carlo Bo, Italy.

† University of Urbino Carlo Bo, Italy.

1. Introduction

In liberal democracies, getting vaccinated should and most often is a free choice. By this, we mean that competent citizens cannot be physically constrained to get a vaccine dose. Indeed, this would infringe the principle, key in liberal democracies, according to which a competent citizen can be subjected to a medical procedure only whether he previously gave his consent. However, policymakers are equipped with a vast toolbox to encourage citizens to roll up their sleeves and get vaccinated without physically forcing them. For instance, mandatory policies, both based on financial or non-financial interventions, are kinds of policy tools that policymakers can legitimately take advantage of to boost the vaccine rate. As concerns the financial interventions, fining vaccine decliners is an extensively exploited policy tool. As an instance, let us consider the Italian 119/2017 law, also known as Lorenzini law. In 2017, the Italian government responded to an alarmingly decreasing vaccine coverage rate, resulting in several measles outbreaks, approving the Lorenzini law (Siani, 2019). The Lorenzini law imposed administrative sanctions on the families of unvaccinated children when medical exemptions were excluded.¹ However, fines are not the only kind of financial disincentive on which policymakers can count. An instance of a financial disincentive different from fines characterizes the Australian “No Jab No Pay” policy, introduced in 2015. Such policy provided the withholding of financial child support from parents of unvaccinated children when medical exemptions were excluded (Trentini et al., 2019).

Less frequently, policymakers reward vaccine takers instead of punishing vaccine decliners. A recent example of rewarding strategies is the lottery program introduced in Ohio by Governor Mike DeWine (Vigdor & Paybarah, 2021 May. 27).

Policymakers who aim to raise the vaccine demand as well can rely on the effectiveness of non-financial interventions. For instance, the abovementioned Lorenzini Law does not provide only administrative sanctions. Indeed, it involves the request of presenting the proof of vaccination as a condition to see children admitted in preschools, day-care centers, and primary schools (Signorelli et al., 2018).²

¹ Concerning the Lorenzini law, it should be stressed that the administrative sanctions provided have been factually levied very occasionally (Magnano, 2019).

² See also the Australian “No Jab No Play” policy, for which the enrollment of unvaccinated children in kindergartens and day-care centers is denied (Trentini et al., 2019).

Additionally, non-financial rewards are part of the toolbox. Richard Thaler — one of the fathers of behavioral economics — has argued for introducing COVID-19 health passports that, ensuring the chance to gain access to public spaces, consist of appealing perks for vaccine takers (Thaler, 2021). Governments have already implemented this measure (Ministry of Health of Israel, n.d.; European Parliament and European Council, 2021).

Finally, governments took advantage of a tougher measure to raise the vaccine rate, namely the incarceration of vaccine decliners (Gravagna et al., 2020).³

All these mandatory policies do not physically coerce citizens to vaccinate themselves; rather, they spur them to become vaccine takers. Hence, assured that vaccines are available to citizens, taking or declining a vaccine are both options⁴ available to competent citizens who live in modern liberal democracies. How these policies impact on citizens' behavior deserves an adequate investigation. This being the case, cognitive and behavioral scientists carry on this research, and they suggest two ways to enhance vaccine policies. On the one hand, they point out how results from B&C sciences are pivotal to improve the effectiveness of mandatory policies. On the other hand, they have argued for deploying less traditional policy tools, namely *nudges*. Briefly, nudges are policy tools that arguably leave human beings free to choose but, leveraging on cognitive mechanisms, steer them toward a targeted behavior (Thaler & Sunstein 2021). In the following two sections, we discuss both cases through some relevant examples. We begin by discussing some instances of such hybrid and behaviorally informed mandatory policies (§2). Next, we focus on nudges (§3). In section 4, we introduce the debate on the ethics of nudges, focusing on the “alien control” objection and its relevance for the citizens' freedom and autonomy. In section 5, we present the original point of the paper. We argue that, referring to nudging vaccination, a somehow neglected ethical issue posed by nudges emerges. Our point is that nudges do not exclusively exert an influence over a targeted behavior. Indeed, they also impose a political influence, for which policymakers treat citizens as means to succeed in achieving peculiar and potentially controversial political aims. We argue that citizens can hardly detect the nudges' political influence due to what we propose to call “the political multi-justifiability”. In the last section, we draw some provisional conclusions

³ See also Walkinshaw (2011).

⁴ Even if one of the alternatives is highly demanding both from an economical and a psychological point of view.

and suggest a possible solution based on making the political influence explicitly transparent. Finally, we note as, concerning nudging vaccination, the transparency of the political influence *might* turn out to be a policy feature that enhances nudges' effectiveness.

2. Behaviorally informed mandatory policies

In the previous section, we referred to administrative sanctions. Results from B&C sciences cast doubt on their effectiveness to deter vaccine-declining. One of the reasons behind this scepticism is the so-called "motivation crowding-out effect". The vast majority of citizens rightly consider taking a vaccine as a prosocial choice, mainly since it contributes to reaching herd immunity. As regards the specific case of the SARS-CoV-2 vaccines, the scientific community does not know yet with certainty whether vaccine takers indirectly protect completely unvaccinated people or otherwise. However, recent research leads to believe that SARS-CoV-2 vaccine takers protect others from the virus (Petter et al., 2021; Levine-Tiefenbrun et al., 2021; Mallapaty, 2021; on the other hand, see also Subbaraman, 2012).

Nevertheless, even if it turned out that SARS-CoV-2 vaccines are ineffective in stopping or significantly reducing the transmission of the virus, SARS-CoV-2 vaccination should still be considered a prosocial choice for two separate reasons. Firstly, getting one of the SARS-CoV-2 vaccines curbs the chance that the virus replicates itself and, in turn, that some new and potentially worrisome variants emerge and spread (McCormick et al., 2021). Secondly, being a SARS-CoV-2 vaccine taker is prosocial in that it sharply reduces the need for hospitalization due to COVID-19 related diseases. Avoiding being hospitalized prevents the draining of health systems resources, highly demanded during the health crisis (Maringe et al., 2020).⁵ B&C research results suggest that the prosocial value of certain actions motivates human beings' behaviors. In other words, knowing that from a specific decision benefits for others spring increases our interest in that behavior. The vaccine uptaking seems to be no exception (Betsch et al., 2013; Quadri-Sheriff et al., 2012; Korn et al., 2018).

Nevertheless, B&C scientists pointed out as well that financial disincentives levied on those who could behave prosocially, but fail to do so, wipe out such intrinsic attentiveness. The "motivation crowding-out effect" is at the roots of

⁵ This applies as well in ordinary circumstances, in the case in which the allocated resources are sufficient, to not mention the several cases wherein the resources are inadequate.

this phenomenon. The motivation crowding-out effect impact on our choices in disparate circumstances (see Gneezy et al., 2011; Ariely et al., 2009; Bowles, 2008; Mellström & Johannesson, 2008; Fehr & Gächter, 2002; Fehr & Rockenbach, 2003; Gneezy & Rustichini, 2000; Calabuig et al., 2016), and also in the vaccine choice (Madrian, 2014). Such results on the undermining effect of financial disincentives on prosociality lead B&C scientists to question policy proposals by which SARS-CoV-2 vaccine decliners are fined (see Schmelz, 2020).⁶ One could consider the threat posed by the motivation crowding-out effect not alarming at all. Indeed, one could argue that policymakers could solve the root of the problem by imposing sufficiently high fines: they would make unduly the disutility associated with refusing vaccination for the vast majority of citizens, leading them to become vaccine takers. Notwithstanding, to leverage high fines is factually an unavailable possibility for two reasons. On the one hand, high fines entail costly monitoring, not necessarily sustainable (Bicchieri et al., 2021). On the other hand, they easily trigger the perception of unfairness, creating inequality between wealthy and poor citizens. As a result, introducing high fines could likely result in a hostile atmosphere and, possibly, retaliation (Xiao, 2018)⁷. Thus, only weak fines are factually at policymakers' disposal. However, they could prompt the motivation crowding effect. Furthermore, B&C scientists consider financially rewarding altruistic behaviours as a policy strategy that triggers the motivation crowding-out effect. B&C sciences lead to caution in rewarding vaccine takers, as in the case of the Ohio lottery mentioned above (Buttenheim & Asch, 2013; on rewarding and the motivation crowding effect, in general, see Fehr & Falk, 2002).

B&C sciences can fruitfully drive the policymakers' preferences among several mandatory policies. As a concrete example, one could consider strategies aimed to curb the use of disposable plastic bags. Homonoff (2018) found out that a five-cent tax⁸ levied on the users of disposable plastic bags

⁶ Although Scholars raised many concerns regarding the effectiveness of fine-based policy measures (see Drew, 2019), overall, there is a lack of epidemiological studies on the efficacy of mandatory policies (Gravagna et al., 2020).

⁷ One could argue that providing income-based fines, rather one-size-fits-all fines, could avoid inequality. However, the constitutionality of income-based fines is controversial. For instance, regarding the United States, its unconstitutionality may be due to a violation of the excessive fine clause provided by the Eighth Amendment of the United States Constitution.

⁸ Notice that here the disincentive is not a fine but instead a tax.

considerably reduces their use. In contrast, a five-cent bonus to those who use reusable bags has virtually no impact. To prefer imposing a tax to reward is suggested by the B&C research results, precisely because of the loss aversion and the endowment effect.⁹

B&C sciences can be instrumental not only in selecting traditional policies and in enhancing them. Indeed, the so-called “nudges” are policy tools the effectiveness of which is based precisely on their ability to leverage on human cognition. In the next section, we discuss nudges, dwelling on examples relevant to the vaccine case. The third section prepares the ground for discussing the ethics of nudging vaccination; we will explore this topic in sections 4 and 5.

3. Nudging Vaccination

B&C scientists made apparent that some aspects of the “architecture of choice”, considered irrelevant in mainstream economics, are instead determinant in steering choices. Nudges are policy tools that take advantage of such aspects. Scholars have largely discussed the employment of nudges to enhance SARS-CoV-2 vaccine policies and, more broadly, to fight against COVID-19 (see Bavel et al., 2020; Wood & Schulman, 2021; World Health Organization, 2020; Volpp et al., 2021; Lunn et al. 2020). One of the most interesting results from B&C sciences relevant for the vaccine case is the allure of social norms. Results from B&C sciences underline how the free choices expressed by peers heavily influence the individual’s free choices. Our behaviors are conditional to what we think peers believe is fair to do and what we think peers factually do (Abrams et al., 1990; Cialdini & Goldstein, 2004; Bicchieri & Dimant, 2019; Bicchieri 2016). The role played by social norms and peer pressure in shaping human choices has been detected in many contexts. So contexts are distant from the case of the current pandemic, as the use of hotel towels (Goldstein et al., 2008) and the decisions taken facing economic games (Fischbacher et al., 2001). Instead, other contexts are closely connected with the covid-19 emergence, such as wearing medical face masks or respecting physical

⁹ The endowment effect is the phenomenon for which human beings assign to a certain good or service a higher value if owned than unowned (Kahneman et al., 1990).

distancing (Nakayachi et al., 2020; Bicchieri et al., 2020).¹⁰ Norm-nudges are conceived to leverage on social norms and peer pressure. More accurately, norm-nudges are communication strategies that emphasize either that a large part of the reference network behave as policymakers desire or, at least, that an increasing percentage of that network is opting for the targeted behavior (Sparkman & Walton, 2017; Bond et al., 2012; Hayes et al., 2015; Yoeli et al., 2013). These communication strategies could be information campaigns or more creative digital strategies; for instance, items that give citizens the chance to signal their behavior, such as the “I Got My COVID-19 Vaccine” Facebook profile frame template. Peer pressure and social norms are key behavior drivers of vaccine choice in general (Bish et al., 2011; Xiao & Borah, 2020), and the same applies to the particular case of the uptake of the SARS-CoV-2 vaccine (Haker, 2020). Therefore, B&C scientists suggest that policymakers who want to promote vaccine uptake should take advantage of norm-nudging, implementing strategies to communicate that the peers are vaccine takers (Bruine de Bruin et al., 2019; Falletti, 2020). Let us refer to this kind of nudges as the “peer push for vaccines” nudges. The peer-push-for-vaccines is a nudge that distinctly illustrates the two main features common to all the nudges.

Firstly, nudges should be considered “soft” intervention, in contrast with traditional, “hard” policy tools available to policymakers as coercion, ban, and financial incentives, both positive and negative. Nudges are soft because they leave all the options available since none are removed, prohibited, or discouraged through coercive means. Instead, nudges leave open the possibility to deviate with negligible efforts from the behavior targeted by policymakers (Thaler & Sunstein, 2021).

Secondly, nudges trigger cognitive mechanisms pertaining to the so-called system 1. System 1 is one of the constituent elements of a dual-system *account* of the human mind. Such theory assumes that human choices and decisions can be framed with reference to two different “systems”, which should be considered *fictitious models* that work in parallel. One of them is called “system 1” and the other one “system 2”. They are respectively associated with “fast” and “slow” thinking (Kahneman, 2011). System 1 is responsible for unconscious and automatic cognitive mechanisms. It drives human beings to decide intuitively

¹⁰ We prefer “physical distancing” over the widespread and misleading “social distancing”. The COVID-19 emergency calls for limiting close physical human connections and not for restricting social interactions (see Abel & McQueen, 2020).

and effortlessly. Conversely, conscious, reflective, and effortful cognitive processes pertain to system 2. In the following two sections, we discuss the ethics of nudges through the example of the peer-push-for-vaccines nudge, dwelling on the nature of system 1.

4. The ethics of nudging: the opposition and the undetectability conditions

Results from B&C sciences shape both hybrid policies and nudges aimed to face the COVID-19 emergency and, more specifically, to improve the uptake of the SARS-CoV-2 vaccine. However, there is no agreement on the reliability of such results. Instead, there is a wide spectrum of nuanced viewpoints. On one side of the spectrum, scientists are optimistic about the readiness of results from B&C sciences to be translated into policy interventions (see Bavel et al., 2020). On the opposite side of the spectrum, there are those B&C scientists who advocate caution and epistemic humility regarding the role the results from their fields of investigations in shaping anti-COVID policies should play (see IJzerman et al., 2020). This caution came from the typical methodological drawbacks of B&C research investigations. Above all, they often rely on samples drawn from a slice of scarcely representative populations (Henrich et al., 2010). Furthermore, it is not unusual that the very same phenomenon emerges in one context but does not, in a different one, or does but or just in a mild degree (Shimizu & Udagawa, 2018). Overall, despite there is disagreement on the topic, B&C scientists have extensively debated the methodological and practical issues arising when B&C research results inform policy interventions to boost vaccination.¹¹ Unfortunately, we cannot say the same about the ethical issues involved in *nudging vaccination*, even though the literature devoted to the ethics of nudges is wide-ranging and vast (e.g. Goodwin, 2012; Bovens, 2009; Grüne-Yanoff, 2012; Sunstein, 2015). B&C scientists who argue for nudges as tools to augment the number of vaccine takers have overlooked context-specific ethics issues. Here, we focus on the “alien control” objection through the lens of the vaccine case. “Alien control” refers to a kind of control over individuals whereby an agent has the power to influence the choice of another agent, and the latter

¹¹ Other than advocating caution, B&C scientists are taking action to improve the robustness of their research results to make them ready for policymakers (Moshontz et al., 2018) and developing criteria to assess the readiness of the research results from B&C sciences (Ruggeri et al., 2020; IJzerman et al., 2020).

cannot control such power in some suitably defined sense (see Schmidt, 2017). Policy tools that impose such kind of control are unacceptable in liberal democracies in that they give policymakers the chance of imposing their own will over the citizens' will. *Control* unfolds when someone influences the behavior of someone else in a non-coercive way. The threat of *alien* control also needs the unawareness of controlled people. Therefore, one has "alien control" when the following two conditions are realized:

- 1) A citizen has the chance to show opposition toward the aim policymakers expect to achieve through the means of influence exploited (*opposition condition*);
- 2) Both the mechanisms of influence through which the policymaker aims to influence her/him and the aim itself are undetectable by her/him (*undetectability condition*).

To highlight the peculiarity of this form of control, we could compare it with a traditional form of influence, i.e. a mandatory financial intervention. As seen in section 1, the so-called Lorenzini law imposed fines on the families of unvaccinated children when medical exemptions were excluded. These administrative sanctions do not represent a form of alien control. On one side, consistently with the opposition condition, the administrative sanctions imposed by the law leave citizens the chance to show opposition toward the aim pursued through the fine; indeed, citizens can pay the fines and decline vaccination as a result.¹² However, the *undetectability condition* is not met. Indeed, both the mechanisms of influence behind the fine (i.e. the disutility represented by a financial loss) and its aim are self-evident and easily detectable by citizens. Alien control is due to a more subtle form of influence than mandatory policies. If alien control is in place, citizens can show opposition but typically *fail to do so* due to the difficulties in detecting the influence. Concerning the vaccine case, nudges would entail alien control if, despite leaving citizens the possibility to decline the vaccine, both their mechanisms of

¹² It is worth noting that nudges and mandatory policies are different from each other concerning the consequences of opposition. On the one hand, the consequences of diverting from the targeted behavior of nudges are reversible (indeed nudges do not modify the legal and administrative position of the citizens). On the other hand, the consequences of mandatory policies are irreversible.

influence and aims, namely increasing the vaccine uptake, are undetectable by citizens.

To see if it is the case, we should begin by considering the opposition condition. In section 3, we pointed out that nudges are “soft” policy tools, namely interventions that do not preclude any behaviors alternative to the one targeted by the policymakers. Thus, nudges do not forbid any options. This means that the opposition condition is met: the influences exerted through nudges do not preclude the chance to behave differently than how policymakers yearned. Peer-push-for-vaccines is a nudge that meets the opposition condition. Indeed, the communication strategies that take advantage of peer pressure allow citizens to withstand the pressure and refuse the vaccine.

Unfortunately, nudges seem to meet also the undetectability condition. In section 3, we stressed that nudges leverage on cognitive mechanisms pertaining to the so-called System 1. The point is that the cognitive processes resulting from System 1 are automatic, and humans are typically unconscious about them. Hence, those policy tools, whose influence is based on System 1, seem to be undetectable. Concerning the peer-pressure-for-vaccines-nudge, citizens are typically unaware of the role of norm-nudging in shaping their choices. In view of the above considerations, it seems that nudges constitutively imply the threat of alien control. Should then nudges be discarded? Or, instead, are there precautions enforceable to defuse the threat of alien control when nudging?

In a seminal paper, Luc Bovens (2009) analyzes the ethical concerns raised due to the opacity of nudges. Very briefly, Bovens argues that, on closer inspection, the mechanisms of influence on which nudges are based and their targets are transparent in principle.¹³ According to Bovens, as long as human beings are watchful, they detect nudges and their targeted behavior. Concerning the peer-push-for-vaccines, Bovens would claim that if a citizen takes full advantage of his cognitive abilities, he can detect the mechanisms underlying the nudge. Indeed, watchful citizens can spot in the communication strategy adopted by a policymaker the attempt to take advantage of peer pressure to steer them to imitate their peers. Hence, citizens can detect nudges, and it is up to them to do that, deciding «to become watchful and unmask any manipulation» (Bovens, 2009, p. 217). If this were true, nudges would not impose any form of alien control. Indeed, nudges would be policy measures that do not meet the

¹³ To be more precise, Bovens (2009) makes the distinction between the “in principle token transparency” (which characterized nudges) and “in principle type transparency”. This distinction introduced by Bovens is salient and useful but not strictly needed for what follows.

undetectability condition. It is beyond our current purpose to inquire about the tenability of the Bovens' claim. However, we notice that it seems to be over-optimistic. For instance, it seems reasonable to believe that a citizen cannot detect a nudge if he had not educated himself on the relevant cognitive mechanisms beforehand, regardless of whether he is watchful or not. How could a citizen unfamiliar with the effect of peer pressure detect the peer-push-for-vaccines nudge? It seems unrealistic that he could do it. It is beside the point of this article arguing for or against the Bovens' perspective. Instead, we want to argue that regardless of whether nudges are in-principle transparent, nudging entails the threat of alien control. The reason behind this emerges from the case studies of nudges conceived to boost vaccination. This is the crucial point of the paper.

5. A missing point: the political influence of nudges

The larger part of scholars who pay attention to the ethics of nudges draws attention to what we can refer to as the *behavioral influence* of nudges. The behavioral influence concerns the impact of nudges on the targeted behavior. For instance, concerning the “peer push for vaccine”, we exclusively considered its behavioral influence so far, which is a means to influence the relevant behavior, i.e. vaccination. Bovens also refers only to the behavioral influence in his defense of the in-principle transparency of nudges. What is transparent to watchful citizens, Bovens argues, are the mechanisms of influence and the behavioral aims of nudges. Hence, it would be more accurate to say that Bovens argues for the in-principle transparency of the nudges' behavioral influence. We could refer to such alleged characteristic of nudges as the “in-principle behavioral transparency”. We argue that behavioral influence is not the only one exerted by nudges. If so, even surmising the in-principle behavioral transparency of nudges, it still could be the case that nudging entails the threat of alien control through a different kind of influence.

Nudges exert an additional influence over citizens that the in-principle behavioral transparency cannot defuse. We are referring to what we propose to call the “political influence” of nudging. The political influence exerted by nudges is the influence as a result of which policymakers treat citizens as means. Policymakers pursue peculiar political aims, based on specific – and potentially controversial – normative assumptions when they employ nudge. The point is that the in-principle behavioral transparency seems to be insufficient to make

the political influence detectable. This implies that, concerning the political influence, policymakers can impose their own will over the citizens' will. The very existence of the political influence of nudges and the resulting risk emerges within the hotly debated vaccine choice.

Nudges are policy tools, which can be employed to fulfill several, and possibly opposite, political aims. Among them, the political purposes that are in line with libertarian paternalism. Very briefly, Thaler and Sunstein (2021) are the first proponents of this philosophy and practice of policymaking that differs from both paternalism and libertarianism.

Libertarian paternalists advocate the use of nudges as policy tools that respect individual free choice (being “soft” intervention, see section 3), and that can steer citizens toward the options that make them «better off, as judged by themselves» (Thaler & Sunstein, 2021, p. 11). This is a highly contentious criterion of intervention, which identifies the best choices for humans with the choice they would make if they “had complete information, unlimited cognitive abilities, and no lack of self-control” (Sunstein and Thaler 2003, p.175)¹⁴. Libertarian paternalists have been the first to advocate nudging. Nevertheless, Hansen (2016) pointed out that we should avoid the mistake of considering nudges and libertarian paternalism as synonymous. Libertarian paternalism is instead a specific and, in some respects, innovative philosophy and practice of policymaking. Instead, nudges are policy tools. The employment of nudges can be justified in light of a plurality of philosophies and practices of policymaking, pursuing distinct political aims. For instance, as Guala and Mittone (2015) pointed out, policymakers could use nudges to mitigate externalities and soften the undesirable consequences on the common welfare due to thoughtless behaviors. For instance, consider the case of SMarT – an acronym for Save More Tomorrow –, viz. a pension plan which takes advantage of several nudges aimed to steer U.S. citizens to save a proper amount of money for their retirement years (Thaler & Benartzi, 2004). This very same policy intervention can be introduced either since saving an adequate amount of money makes citizens better off, as judged by themselves, or because it mitigates the externalities resulting from low saving. Policymakers could introduce the very same nudge to accomplish more than one political aim.

¹⁴ For criticisms, see, for example, Grüne-Yanoff, 2012; Guala and Mittone, 2015; Sugden, 2009; Sugden, 2017; Sugden, 2018; Infante et al., 2016; Mitchell, 2005; Calboli & Fano 2015.

For the sake of simplicity, we limit ourselves to refer to two political aims yearned by policymakers who take advantage of nudges to boost SARS-CoV-2 vaccination:

1. *The political aim of libertarian paternalism*: The nudge x is implemented because to become a SARS-CoV-2 vaccine taker is the choice that makes citizens better off, as judged by themselves,
2. *The political aim of protecting the common welfare*: The nudge x is implemented because becoming a vaccine taker is a prosocial choice. Indeed, it contributes to protect the health of the community in the course of the COVID-19 pandemic.¹⁵

We have already seen how SARS-CoV-2 vaccination protects the common welfare (cf. §3). Briefly, the jab contributes to avoiding contagion, curbs the chance that new variants emerge and, contributes to saving resources for patients in need of cure due to COVID-19 related and unrelated diseases.

We want to stress that virtually every conceivable nudge can be employed to fulfill more than one political aim. Through the same nudge, policymakers can pursue different political aims, possibly wholly at odds with each other. We propose to refer to this crucial and newly pointed out inherent characteristic of nudges as the “political multi-justifiability”. The key points here are: that every political agenda is a bearer of values, makes specific methodological assumptions, and intends to shape society accordingly.

Which consequences do the political multi-justifiability of nudges have concerning the objection of alien control? We argue that the political multi-justifiability makes nudges policy tools that, in fact, exert alien control. To see why we need to refer to both the “opposition condition” and the “undetectability condition” we introduced in the previous section. In modern liberal democracies, the “opposition condition” should be in place concerning the political influence. Indeed, citizens own the suitable tools to express dissent and opposition toward pursuing a specific political aim. Citizens who are against a

¹⁵ To be more realistic, we should have referred to *prioritization* of political aims rather than single political aims. For instance, a libertarian paternalism-oriented prioritization could be: “The nudge x is implemented because to get one of the SARS-CoV-2 vaccines and become a vaccine taker is the choice that makes citizens better off, as judged by themselves. As a positive side effect, it protects the health of the community”. Nevertheless, we are dispensed from considering such degree of realism, being irrelevant for the argument.

certain political agenda can indeed outvote its promoters and even more actively take advantage of the right to express their views publicly. Concerning the political influence of nudges, the undetectability condition seems to be in place as well. Once again, the undetectability condition requires that both the mechanism of influence and the aim pursued are undetectable by the latter. Unfortunately, the aim pursued through the political influence of nudges could remain undetectable by citizens. Indeed, due to the political multi-justifiability, even if the behavioral influence was either in fact or in-principle transparent, this transparency could easily be insufficient to make transparent the political influence as well. It would be the case in all the circumstances where the citizens are not perfectly aware of the country's political agenda. Nevertheless, such awareness of the political rationale is uncommon and hardly qualifiable as required by citizens. Hence, referring to the political influence, both the opposition and the undetectability conditions are often in place, making nudges policy tools that entail the threat of alien control.

One might consider the peer-push-for-vaccines nudge as an example. We said that assuming that the strength of the peer pressure is transparent to watchful citizens, the nudge's behavioral influence should be considered detectable. Nevertheless, regardless of whether watchful or not, citizens do not necessarily detect the political aim pursued through the peer-push-for-vaccines nudge. For instance, such nudge could either be introduced to fulfill the libertarian paternalism's aim or, otherwise, to mitigate the consequences on the common welfare due to a high rate of infected citizens. In the end, nudges are policy tools through which policymakers can impose their own will over the citizens' will without a clear and publicly debated justification.

6. Conclusions

In the previous section, we pointed out that, due to political multi-justifiability, the political influence exerted by nudges is inherently undetectable, regardless of whether nudges are in-principle behavioral transparent or not. Because of that, policymakers who fight the SARS-CoV-2 spread seem to be on the horns of a dilemma. On the one hand, they could avoid the threat of alien control, depriving themselves of the employment of mighty policy tools. On the other hand, they could take advantage of nudges, potentially save lives but undermine citizens' freedom.

Are there solutions available? In searching for an answer, it seems straightforward to explore the possibility of making the mechanisms of influence and the aim of the political influence *explicitly* transparent. So, for instance, the peer-push-for-vaccine nudge should be accompanied by pieces of information conceived to disclose its political influences. Let us assume that such nudge is introduced accordingly with libertarian paternalism. If so, the disclosing declaration could go as follows: “We implement the peer-push-for-vaccines nudge because we believe that to get one of the SARS-CoV-2 vaccines is the choice that makes citizens better off, as judged by themselves”. The explicit transparency of the peer-push-for-vaccines nudge’s political influence would put citizens in the position to do not necessarily detect the political aim. However, it is reasonable to expect that the explicit transparency of the political influence compromises the strength of nudges in steering human behaviors. If it were the case, to make the political influence of nudges explicitly transparent would result in a significant loss of nudges’ effectiveness. It could even be the case that the transparency wholly undermines the nudges’ strength.

Relevant in this regard, concerning the behavioral influence, many scholars claimed that the strength of nudges to steer human behaviors depends exactly on their opaque nature. To quote the words of Bovens: «The more actual [...] transparency we demand, the less effective these techniques are» (Bovens, 2009, p. 13). Nevertheless, contrary to this widespread — pretty intuitive to be fair — claim, recent empirical investigations suggest that to explicitly disclosing nudges’ behavioral influence does not impair the effectiveness of nudges (Bruns et al., 2018; Casal et al., 2019; Loewenstein et al., 2015).

Unfortunately, the evidence collected so far concerns only the explicit transparency on the behavioral and not the political influence of nudges. Hence, we still do not know whether the explicit disclosure of political influences would either preserve, compromise, dissolve, or even boost the efficacy of nudges. However, we should note that the worries on the undesirable consequences of explicit transparency on the nudges’ effectiveness come from psychological reactance, namely «the motivational state that is hypothesized to occur when a freedom is perceived as eliminated or threatened with elimination» (Brehm & Brehm, 2013, p. 37). The risk identified by scholars concerning explicit transparency is that psychological reactance would lead citizens to divert from the targeted behaviors. In the vaccine case, this means that psychological reactance toward nudges would backfire and lead citizens to become vaccine decliners.

Nevertheless, it seems very unlikely that psychological reactance could emerge due to the transparency of the political influence. Indeed, citizens perceive the pursuit of a specific political as a right and duty of governments rather than a threat to freedom. Although citizens could disagree with the political agenda pursued through nudges, it seems inaccurate to surmise that a different opinion would lead to diverting from the targeted behavior. Instead, it seems reasonable to believe that the explicit transparency of the political influence could impact the citizens' willingness to express dissent (or agreement) toward the government's political agenda. To sum up, although we acknowledge that further empirical investigations are needed, it is reasonable to believe that the transparency of the political influence would affect political reactions while it would not affect the power of nudges.

Finally, nudging vaccination has specific peculiarities. Indeed, referring to nudges aimed to boost the vaccine rate, the transparency of the political influence could be a policy feature that enhances nudges' effectiveness. One of the political aims pursued by all governments is promoting vaccination in that it protects the community's health. As pointed out in section 2, becoming a SARS-CoV-2 vaccine taker is also a prosocial choice. To make explicitly transparent the political influence of nudging vaccination is a chance to plainly communicate the prosociality of vaccination, i.e. the second political aim we considered in our simplified model presented in the previous section. Policymakers should not miss this opportunity not only for ethical reasons. Indeed, B&C scientists have shown that communication strategies conceived to emphasize the social benefits that spring from vaccination prod citizens to get vaccinated (Betsch et al., 2013; Quadri-Sheriff et al., 2012; Korn et al., 2018). In conclusion, from the analysis of the ethics of nudging vaccination, both the call for making the political influence explicitly transparent and its practical advantage emerge.

REFERENCES

- Abel, T., & McQueen, D. (2020). The COVID-19 pandemic calls for spatial distancing and social closeness: not for social distancing! *International Journal of Public Health*, 65(3), 231. doi.org/10.1007/s00038-020-01366-7
- Abrams, D., Wetherell, M., Cochran, S., Hogg, M. A., & Turner, J. C. (1990). Knowing what to think by knowing who you are: Self-categorization and the nature of norm formation, conformity and group polarization*. *British*

- Journal of Social Psychology*, 29(2), 97–119. doi.org/10.1111/j.2044-8309.1990.tb00892.x
- Ariely, D., Gneezy, U., Loewenstein, G., & Mazar, N. (2009). Large Stakes and Big Mistakes. *Review of Economic Studies*, 76(2), 451–469. doi.org/10.1111/j.1467-937x.2009.00534.x
- Bavel, J.J.V., Baicker, K., Boggio, P.S. *et al.* (2020). Using social and behavioural science to support COVID-19 pandemic response. *Nature Human Behaviour*, 4, 460–471. doi.org/10.1038/s41562-020-0884-z
- Betsch, C., Böhm, R., & Korn, L. (2013). Inviting free-riders or appealing to prosocial behavior? Game-theoretical reflections on communicating herd immunity in vaccine advocacy. *Health Psychology*, 32(9), 978–985. doi.org/10.1037/a0031590
- Bicchieri, C. (2016). *Norms in the wild: How to diagnose, measure, and change social norms*. Oxford University Press.
- Bicchieri, C., & Dimant, E. (2019) Nudging with care: the risks and benefits of social information. *Public Choice*. doi.org/10.1007/s11127-019-00684-6
- Bicchieri, C., Dimant, E., & Xiao, E. (2021). Deviant or Wrong? The Effect of Norm Information on the Efficacy of Punishment. *SSRN Electronic Journal*. doi.org/10.2139/ssrn.3779018
- Bicchieri, C., Fatas, E., Aldama, A., Casas, Deshpande, I., Lauro, M., Parilli, C., Spohn, M., Pereira, P., & Wen, R. (2020). In Science we (should) trust: Expectations and compliance during the COVID-19 pandemic. doi.org/10.21203/rs.3.rs-106840/v1
- Bish, A., Yardley, L., Nicoll, A., & Michie, S. (2011). Factors associated with uptake of vaccination against pandemic influenza: A systematic review. *Vaccine*, 29(38), 6472–6484. doi.org/10.1016/j.vaccine.2011.06.107
- Bond, R. M., Fariss, C. J., Jones, J. J., Kramer, A. D. I., Marlow, C., Settle, J. E., & Fowler, J. H. (2012). A 61-million-person experiment in social influence and political mobilization. *Nature*, 489(7415), 295–298. doi.org/10.1038/nature11421
- Bovens, L., 2009, *The ethics of nudge*, in Grüne-Yanoff, T. and Hansson, S.O. (eds), *Preference Change: Approaches from Philosophy, Economics and Psychology*, Berlin and New York, Springer, pp. 207-219.

- Bowles, S. (2008). Policies Designed for Self-Interested Citizens May Undermine “The Moral Sentiments”: Evidence from Economic Experiments. *Science*, *320*(5883), 1605–1609. doi.org/10.1126/science.1152110
- Brehm, S. S. and Brehm, J. W. (2013). *Psychological reactance: A theory of freedom and control*. Academic Press.
- Bruine de Bruin, W., Parker, A. M., Galesic, M., & Vardavas, R. (2019). Reports of social circles’ and own vaccination behavior: A national longitudinal survey. *Health Psychology*, *38*(11), 975–983. doi.org/10.1037/hea0000771
- Bruns, H., Kantorowicz-Reznichenko, E., Jonsson, M. L. and Rahali, B., 2018, *Can nudges be transparent and yet effective?*, in «Journal of Economic Psychology», 65, pp. 41-59.
- Bутtenheim, A. M., & Asch, D. A. (2013). Making vaccine refusal less of a free ride. *Human Vaccines & Immunotherapeutics*, *9*(12), 2674–2675. doi.org/10.4161/hv.26676
- Calabuig, V., Fatas, E., Olcina, G., & Rodriguez-Lara, I. (2016). Carry a big stick, or no stick at all. *Journal of Economic Psychology*, *57*, 153–171. doi.org/10.1016/j.joep.2016.09.006
- Calboli, S. and Fano, V., 2015, *La spinta gentile e il paternalismo libertario*, in «Nuova Secondaria», 3, pp. 59-61.
- Casal, S., Guala, F. and Mittone, L., 2019, *On the Transparency of Nudges: An Experiment*, in «CEEL Working Papers n. 1902».
- Cialdini, R. B., & Goldstein, N. J. (2004). Social Influence: Compliance and Conformity. *Annual Review of Psychology*, *55*(1), 591–621. doi.org/10.1146/annurev.psych.55.090902.142015
- Drew, L. (2019). The case for mandatory vaccination. *Nature*, *575*(7784), S58–S60. https://doi.org/10.1038/d41586-019-03642-w
- European Parliament and European Council (2021). Regulation (EU) 2021/953 of the European Parliament and of the Council of 14 June 2021 on a framework for the issuance, verification and acceptance of interoperable COVID-19 vaccination, test and recovery certificates (EU Digital COVID Certificate) to facilitate free movement during the COVID-19 pandemic. Retrieved 14 October, 2021, from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32021R0953

- Fehr, E., & Falk, A. (2002). Psychological foundations of incentives. *European Economic Review*, 46(4–5), 687–724. doi.org/10.1016/s0014-2921(01)00208-2
- Fehr, E., & Gächter, S. (2002). Do Incentive Contracts Undermine Voluntary Cooperation? *SSRN Electronic Journal*. doi.org/10.2139/ssrn.313028
- Fehr, E., & Rockenbach, B. (2003). Detrimental effects of sanctions on human altruism. *Nature*, 422(6928), 137–140. doi.org/10.1038/nature01474
- Felletti, S. (2020). “Trust me, I’m your neighbour” How to improve epidemic risk containment through community trust. *Mind & Society*, 1–4. doi.org/10.1007/s11299-020-00266-w
- Fischbacher, U., Gächter, S., & Fehr, E. (2001). Are people conditionally cooperative? Evidence from a public goods experiment. *Economics Letters*, 71(3), 397–404. doi.org/10.1016/s0165-1765(01)00394-9
- Gneezy, U., Meier, S., & Rey-Biel, P. (2011). When and Why Incentives (Don’t) Work to Modify Behavior. *Journal of Economic Perspectives*, 25(4), 191–210. doi.org/10.1257/jep.25.4.191
- Gneezy, U., & Rustichini, A. (2000). Fine is a price. *The Journal of Legal Studies*, 29(1), 1–17.
- Goldstein, N. J., Cialdini, R. B., & Griskevicius, V. (2008). A Room with a Viewpoint: Using Social Norms to Motivate Environmental Conservation in Hotels. *Journal of Consumer Research*, 35(3), 472–482. doi.org/10.1086/586910
- Goodwin, T. (2012). Why we should reject ‘nudge’. *Politics*, 32(2), 85–92.
- Gravagna, K., Becker, A., Valeris-Chacin, R., Mohammed, I., Tambe, S., Awan, F. A., Toomey, T. L., & Basta, N. E. (2020). Global assessment of national mandatory vaccination policies and consequences of non-compliance. *Vaccine*, 38(49), 7865–7873. doi.org/10.1016/j.vaccine.2020.09.063
- Grüne-Yanoff, T. (2012). Old Wine in New Casks: Libertarian Paternalism Still Violates Liberal Principles. *Social Choice and Welfare*, 38 (4), 635–45.
- Guala, F. and Mittone, L., 2015, *A political justification of nudging*, in «Review of Philosophy and Psychology», 6, pp. 385–395.
- Haker, J. (2020). Planning for a COVID-19 Vaccination Campaign: The Role of Social Norms, Trust, Knowledge, and Vaccine Attitudes. 10.31234/osf.io/q8mz6

- Hansen, P., 2016, *The definition of nudge and libertarian paternalism: does the hand fit the glove?*, in «European Journal of Risk Regulation», 7(1), pp. 155–174.
- Hayes, K. J., Eljiz, K., Dadich, A., Fitzgerald, J. A., & Sloan, T. (2015). Trialability, observability and risk reduction accelerating individual innovation adoption decisions. *Journal of Health Organization and Management*, 29(2), 271–294. doi.org/10.1108/jhom-08-2013-0171
- Henrich, J., Heine, S.J., Norenzayan, A. (2010). The weirdest people in the world?. *Behavioral and Brain Sciences*, 33 (2-3), 61-83.
- Homonoff, T. A. (2018). Can Small Incentives Have Large Effects? The Impact of Taxes versus Bonuses on Disposable Bag Use. *American Economic Journal: Economic Policy*, 10(4), 177–210. https://doi.org/10.1257/pol.20150261
- Ijzerman, H., Lewis, N. A., Przybylski, A. K., Weinstein, N., DeBruine, L., Ritchie, S. J., Vazire, S., Forscher, P. S., Morey, R. D., Ivory, J. D., & Anvari, F. (2020). Use caution when applying behavioural science to policy. *Nature Human Behaviour*, 4(11), 1092–1094. doi.org/10.1038/s41562-020-00990-w
- Infante, G., Lecouteux, G. and Sugden, R., 2016, *Preference purification and the inner rational agent: a critique of the conventional wisdom of behavioural welfare economics*, in «Journal of Economic Methodology», 23 (1), pp. 1-25.
- Kahneman, D., 2011, *Thinking, Fast and Slow*, New York, Macmillan.
- Kahneman, D., Knetsch, J.L., & Thaler, R.H. (1990). Experimental tests of the endowment effect and the coase theorem. *Journal of Political Economy*, 98, 1325–1348.
- Korn, L., Betsch, C., Böhm, R., & Meier, N. W. (2018). Social nudging: The effect of social feedback interventions on vaccine uptake. *Health Psychology*, 37(11), 1045–1054. doi.org/10.1037/hea0000668
- Levine-Tiefenbrun, M., Yelin, I., Katz, R. et al. (2021). Decreased SARS-CoV-2 viral load following vaccination. 10.1101/2021.02.06.21251283
- Loewenstein, G., Bryce, C., Hagmann, D., & Rajpal, S., 2015, *Warning: You are about to be nudged*, in «Behavioral Science & Policy», 1, pp. 35-42.
- Lunn, P. D., Belton, C. A., Lavin, C., McGowan, F. P., Timmons, S., & Robertson, D. A. (2020). Using Behavioral Science to help fight the Coronavirus. *Journal of Behavioral Public Administration*, 3(1). doi.org/10.30636/jbpa.31.147
- Madrian, B. C. (2014). Applying Insights from Behavioral Economics to Policy Design. *Annual Review of Economics*, 6(1), 663–688. doi.org/10.1146/annurev-economics-080213-041033

- Magnano, R. (2019, Mar. 11). Vaccini, fuori chi non è in regola ma le sanzioni restano sulla carta. *Il Sole 24 Ore*. www.ilsole24ore.com/art/vaccini-fuori-chi-non-e-regola-ma-sanzioni-restano-carta-ABbYnucB
- Mallapaty, S. (2021). Can COVID vaccines stop transmission? Scientists race to find answers. *Nature*. doi.org/10.1038/d41586-021-00450-z
- Maringe, C., Spicer, J., Morris, M., Purushotham, A., Nolte, E., Sullivan, R., Rachet, B., & Aggarwal, A. (2020). The impact of the COVID-19 pandemic on cancer deaths due to delays in diagnosis in England, UK: a national, population-based, modelling study. *The Lancet Oncology*, *21*(8), 1023–1034. doi.org/10.1016/s1470-2045(20)30388-0
- McCormick, K. D., Jacobs, J. L., & Mellors, J. W. (2021). The emerging plasticity of SARS-CoV-2. *Science*, *371*(6536), 1306–1308. doi.org/10.1126/science.abg4493
- Mellström, C., & Johannesson, M. (2008). Crowding Out in Blood Donation: Was Titmuss Right? *Journal of the European Economic Association*, *6*(4), 845–863. doi.org/10.1162/jeea.2008.6.4.845
- Ministry of Health of Israel (n.d.). What is a Green Pass? Retrieved 31 May, 2021, from corona.health.gov.il/en/directives/green-pass-info/
- Mitchell, G., 2005, *Libertarian paternalism is an oxymoron*, in «Northwestern University Law Review», 99, pp. 1245–77.
- Moshontz, H., Campbell, L., Ebersole, C. R., IJzerman, H., Urry, H. L., Forscher, P. S., et al. (2018). The psychological science accelerator: advancing psychology through a distributed collaborative network. *Adv. Methods Pract. Psychol. Sci.* *1*, 501–515. doi: 10.1177/2515245918797607
- Nakayachi, K., Ozaki, T., Shibata, Y., & Yokoi, R. (2020). Why Do Japanese People Use Masks Against COVID-19, Even Though Masks Are Unlikely to Offer Protection From Infection? *Frontiers in Psychology*, *11*, 1918. doi.org/10.3389/fpsyg.2020.01918
- Petter, E., Mor, O., Zuckerman, N., Oz-Levi, D., Younger, A., Aran, D., & Erlich, Y. (2021). Initial real world evidence for lower viral load of individuals who have been vaccinated by BNT162b2. [10.1101/2021.02.08.21251329](https://doi.org/10.1101/2021.02.08.21251329)
- Quadri-Sheriff, M., Hendrix, K. S., Downs, S. M., Sturm, L. A., Zimet, G. D., & Finnell, S. M. E. (2012). The Role of Herd Immunity in Parents' Decision to Vaccinate Children: A Systematic Review. *Pediatrics*, *130*(3), 522–530. doi.org/10.1542/peds.2012-0140

- Ruggeri, K., van der Linden, S., Wang, Y. C., Papa, F., Riesch, J., Green, J. (2020). Standards for evidence in policy decision-making. *Nature Research Social and Behavioural Sciences*, 399005. [go.nature.com/2zdTQIs](https://doi.org/10.1038/s41598-020-22470-1)
- Schmelz, K. (2020). Enforcement may crowd out voluntary support for COVID-19 policies, especially where trust in government is weak and in a liberal society. *Proceedings of the National Academy of Sciences*, 118(1), e2016385118. doi.org/10.1073/pnas.2016385118
- Schmidt, A. (2017). “The Power to Nudge.” *American Political Science Review* 111(2), 404-417.
- Shimizu, K., & Udagawa, D. (2018). Is human life worth peanuts? Risk attitude changes in accordance with varying stakes. *Plos One*, 13(8), e0201547. doi.org/10.1371/journal.pone.0201547
- Siani, A. (2019). Measles outbreaks in Italy: A paradigm of the re-emergence of vaccine-preventable diseases in developed countries. *Preventive Medicine*, 121, 99-104. [10.1016/j.ypmed.2019.02.011](https://doi.org/10.1016/j.ypmed.2019.02.011)
- Signorelli, C., Iannazzo, S., & Odone, A. (2018). The imperative of vaccination put into practice. *Lancet Infectious Diseases*, 18(1), 26-27. [10.1016/S1473-3099\(17\)30696-5](https://doi.org/10.1016/S1473-3099(17)30696-5)
- Sparkman, G., & Walton, G. M. (2017). Dynamic Norms Promote Sustainable Behavior, Even if It Is Counternormative. *Psychological Science*, 28(11), 1663–1674. doi.org/10.1177/0956797617719950.
- Subbaraman, N. (2021). How do vaccinated people spread Delta? What the science says. *Nature*, 596(7872), 327–328. <https://doi.org/10.1038/d41586-021-02187-1>
- Sugden, R., 2009, *On Nudging: A Review of Nudge: Improving Decisions About Health, Wealth and Happiness*, in «International Journal of the Economics of Business», 16 (3), pp. 365-73.
- Sugden, R., 2017, *Do people really want to be nudged towards healthy lifestyles?*, in «International Review of Economics», 64, pp. 113–23.
- Sugden, R., 2018, *The Community of Advantage: A Behavioural Economist's Defence of the Market*, Oxford, New York, Oxford University Press.
- Sunstein, C., 2015, *The ethics of nudging*, in «Yale Journal on Regulation», 32, pp. 414–450.
- Sunstein, C. and Thaler, R. H., 2003, *Libertarian Paternalism Is Not An Oxymoron*, in «The University of Chicago Law Review», 70(4), p. 1159-1202.

- Thaler, R.H. (2021, 4 February). Getting Everyone Vaccinated, With ‘Nudges’ and Charity Auctions. *The New York Times*.
www.nytimes.com/2020/12/09/business/coronavirus-vaccination-auctions-celebrities.html
- Thaler, R. H. and Benartzi, S., 2004, *Save More Tomorrow®: Using Behavioral Economics to Increase Employee Saving*, in «Journal of Political Economy», 112, pp. 164-87.
- Thaler, R.H., & Sunstein, C. (2021). *Nudge: The Final Edition*. Penguin Books.
- Trentini, F., Poletti, P., Melegaro, A., & Merler, S. (2019). The introduction of ‘No jab, No school’ policy and the refinement of measles immunization strategies in high-income countries. *BMC Medicine*, 17(1), 86. doi: 10.1186/s12916-019-1318-5
- Vigdor, N., & Paybarah (2021, 27 May). Ohio Lottery to Give 5 People \$1 Million Each to Encourage Vaccination. *The New York Times*.
www.nytimes.com/2021/05/12/us/ohio-lottery-coronavirus-vaccine.html
- Volpp, K. G., Loewenstein, G., & Bутtenheim, A. M. (2021). Behaviorally Informed Strategies for a National COVID-19 Vaccine Promotion Program. *JAMA*, 325(2), 125–126. <https://doi.org/10.1001/jama.2020.24036>
- Walkinshaw, E. (2011). Mandatory vaccinations: The international landscape. *Canadian Medical Association Journal*, 183(16), E1167–E1168. doi.org/10.1503/cmaj.109-3993
- Wood, S., & Schulman, K. (2021). Beyond Politics – Promoting Covid-19 Vaccination in the United States. *New England Journal of Medicine*, 384(7), e23. doi.org/10.1056/nejmms2033790
- World Health Organization. (2020). Behavioural considerations for acceptance and uptake of covid-19 vaccines: who technical advisory group on behavioural insights and sciences for health (pp. I-li, Rep.). *World Health Organization*. doi:10.2307/resrep27868.1
- Xiao, E. (2018). Punishment, social norms, and cooperation. In C. J. Teitelbaum, & K. Zeiler (Eds.), *Research Handbook on Behavioral Law and Economics*, 155–173. Edward Elgar Publishing.
- Xiao, X., & Borah, P. (2020). Do Norms Matter? Examining Norm-Based Messages in HPV Vaccination Promotion. *Health Communication*, 1–9. doi.org/10.1080/10410236.2020.1770506

- Yoeli, E., Hoffman, M., Rand, D. G., & Nowak, M. A. (2013). Powering up with indirect reciprocity in a large-scale field experiment. *Proceedings of the National Academy of Sciences*, *110* (Supplement_2), 10424–10429. doi.org/10.1073/pnas.1301210110