

# The Ethics of Vaccination Nudges in Pediatric Practice

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**Abstract** Techniques from behavioral economics—nudges—may help physicians increase pediatric vaccine compliance, but critics have objected that nudges can undermine autonomy. Since autonomy is a centrally important value in healthcare decision-making contexts, it counts against pediatric vaccination nudges if they undermine parental autonomy. Advocates for healthcare nudges have resisted the charge that nudges undermine autonomy, and the recent bioethics literature illustrates the current intractability of this debate. This article rejects a principle to which parties on both sides of this debate sometimes seem committed: that nudges are morally permissible only if they are consistent with autonomy. Instead, I argue that, 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. This article concludes with a set of worries about the effect of pediatric vaccination nudges on parent-physician relationships, and it calls on the American Academy of Pediatrics to draw on scientific and bioethics research to develop guidelines for the use of nudges in pediatric practice and, in particular, for the use of pediatric vaccination nudges.

**Keywords** Autonomy · Informed consent · Nudges · Vaccines

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As many as 20–40 % of physicians dismiss (or refuse to accept) families that do not agree to vaccinate their children (Flanagan-Klygis et al. 2005; O’Leary et al. 2015). This practice violates the guidelines developed by Douglas Diekema and the Committee on Bioethics of the American Academy of Pediatrics (AAP), according to which physicians should “avoid discharging patients from their practices solely because a parent refuses to immunize his or her child” (Diekema and American Academy of Pediatrics Committee on Bioethics 2005, 1430). This AAP committee directs physicians to revisit vaccination decisions with vaccine-refusing parents on subsequent clinic visits, with the hope that they will change their minds. But Diekema and the AAP Committee on Bioethics may be too optimistic about the tractability of vaccine refusers. Recent studies show that factual information about vaccines is usually unpersuasive (Dubé et al. 2015; Nyhan et al. 2014), even when physicians have received specialized training in vaccine communication (Henrikson et al. 2015). Physicians also find it emotionally draining to have unproductive discussions with vaccine refusers (Kempe et al. 2011). And it may become financially draining for physicians to tolerate vaccine refusers in their practices, as accountable care organizations acquire greater power to incentivize preventative healthcare delivery, including immunizations (Gleeson et al. 2016). Finally, physicians worry that vaccine refusers will infect other patients, inviting potential malpractice lawsuits (Block 2015).

Physicians usually do not have a legal right to treat children over the objections of their parents. There are exceptions to the law’s deference to parental authority, but the AAP Committee on Bioethics argues that vaccine refusal does not usually impose significant enough risks of serious enough harms to qualify for those exceptions (Diekema and American Academy of Pediatrics Committee on Bioethics 2005). Accordingly, physicians who do not want to tolerate vaccine refusers in their practices may seem to have little choice but to dismiss them.

There may be another way. When people make decisions about topics outside their areas of expertise, they are especially vulnerable to being unconsciously influenced by factors that are not relevant to the facts they are considering. Social psychologists and cognitive scientists have shown that our decisions can be influenced, for example, by the formats in which people present us with information and the beliefs we have about the attitudes and practices of other members of our social groups (Ariely 2010; Haidt 2012; Kahneman 2011). Someone who is able to direct these (and other) kinds of unconscious cognitive processes can sway our decisions. To use language that Thaler and Sunstein (2009) introduced, someone who structures our ‘choice architecture’ in the right way can trigger unconscious reasoning processes to incline us toward a particular choice; this is a *nudge*.

The early literature on nudges focused primarily on their usefulness for public policy and in other institutional contexts. For example, research has shown that employers can increase workplace retirement plan enrollment rates if they enroll employees by default (with an option to opt out), instead of waiting for employees to make a proactive decision to join the plan (Butrica and Karamcheva 2015; Choi et al. 2003). But there has been a recent flurry of interest in potential healthcare nudges (Cohen 2013; Halpern et al. 2007; Li and Chapman 2013; Stevens 2014; Swindell et al. 2010).

The most significant empirical work on pediatric vaccination nudges provides evidence that default nudges can increase vaccine compliance, in much the same way as default nudges can increase participation in workplace retirement plans. Douglas Opel and his collaborators have shown that physicians who treat routine pediatric vaccination as the default option, and who proceed to vaccinate children until parents actively refuse, face only one-third as much vaccine refusal as do physicians who treat not-vaccinating as a default from which parents have to be convinced to deviate (Opel and Omer 2015; Opel et al. 2013, 2015).

Opel et al. identify the relevant default in terms of a distinction between ‘presumptive’ and ‘participatory’ formats for interactions between physicians and parents:

[P]resumptive formats were ones that linguistically presupposed that parents would vaccinate, such as declarations that shots would be given (e.g., “Well, we have to do some shots”)...Participatory formats were ones that linguistically provided parents with relatively more decision-making latitude, such as polar interrogatives (e.g., “Are we going to do shots today?”) and open interrogatives (e.g., “What do you want to do about shots?”), or ones that presupposed that parents would not vaccinate (e.g., “You’re still declining shots?”) (Opel et al. 2013, 1039).

Presumptive formats treat vaccination as a default that parents may opt out of, while participatory formats treat vaccination as an option that must be proactively chosen. Using a presumptive format default works: three times as many parents (83 vs 26 %;  $P < .001$ ) “resisted vaccine recommendations when providers used a participatory rather than presumptive initiation format” (Opel et al. 2013, 1040).

Opel et al. have shown that default nudges may incline parents to agree to vaccinate their children. But other kinds of nudges could increase pediatric vaccine compliance, too (Gostin 2015; Stevens 2014). Vaccination nudges could use framing devices, if they presented information about vaccination in terms of potential gains, rather than potential losses (Tversky and Kahneman 1981). For example, pediatricians could say things like “every year, children around the world receive hundreds of millions of vaccines, and over 99.999 % of them have no serious complications,” and pediatricians could avoid saying (factually equivalent) statements like “every year, hundreds of children around the world experience serious vaccine complications, out of the hundreds of millions who are vaccinated.”

Vaccination nudges might incorporate commitment devices, if, at a time prior to vaccination, people were invited to commit to vaccinating (Milkman et al. 2011). For example, whenever there is a new visit for a first patient, parents might be invited to sign a form that includes language to the effect that the parent agrees to vaccinate their children.

Vaccination nudges might also use various kinds of incentives to nudge parents to vaccinate (Banerjee et al. 2010; Giuffrida and Torgerson 1997). For example, physicians could give parents cash payments for completing vaccine series, or they could provide parents with other benefits in exchange for vaccine compliance.

Vaccination nudges could invoke social norms, too, if people were told that almost everyone vaccinated (Li and Chapman 2013). For example, parents might be

given the latest data from the CDC showing that 80–90 % of US children are fully vaccinated by age five. Or physicians might provide information about vaccination rates in the local community, or among other social identity groups (e.g., race, religion) of which parents are members.

## The Case for Pediatric Vaccination Nudges

There are three reasons to use nudges to increase pediatric vaccine compliance: They may be effective, they are efficient, and they are less coercive than other methods of increasing vaccine compliance.

If some pediatric vaccination nudges work, then that is a very good reason to use them, especially since so little else has been shown to be effective at overcoming vaccine hesitancy and preventing vaccine refusal. However, while decision science is an established field, we are still at the early stages of research into the effectiveness of particular kinds of nudges for increasing pediatric vaccination compliance. But as the previous section shows, there are reasons to think that some kinds of nudges may incline vaccine hesitant parents to agree to vaccinate their children.

Another reason for physicians to use pediatric vaccination nudges is because they are not only effective, but also efficient. Nudges “take little effort beyond constructing a different default option or different wording” (Li and Chapman 2013, 195), and they require “minimal...time and training” (Stevens 2014, 1101).

A final reason to use pediatric vaccination nudges is that they may have a morally commendable (or at least morally neutral) influence on the decision-making of nudged parents (Dubov and Phung 2015). Advocates of nudging argue that nudges preserve liberty, because they leave nudged people with the same set of options, and because the influence of nudges is (supposed to be) easy to escape (Thaler and Sunstein 2009). Also, nudges are sometimes thought to *enhance* autonomy, by helping people overcome weakness of will, or by otherwise de-biasing their decision-making, e.g., helping people to resist anxiety-based vaccine hesitancy (Cohen 2013). More importantly, nudges do less to undermine autonomy than more coercive policies may do. For example, daycare and school immunization mandates—in the absence of non-medical exemptions policies—may coerce parents to vaccinate, if parents are unable to care for or educate their children at home.

## Nudges and Autonomy: An Objection and Two Responses

Others have been less optimistic about the impact of nudges on autonomy (Blumenthal-Barby and Burroughs 2012; Ploug and Holm 2015; Saghai 2013; Sagoff 2013). Some worry that the influence of nudges may not be easy to resist, especially if they are more effective. Also, nudges may seem to induce bad reasoning, if they trigger people’s biases to influence their choices. So, a major worry about nudges—and healthcare nudges, in particular—focuses on how they impact the autonomy of people who are nudged.

Autonomous agents are self-governing: they affirm the motives and results of their actions. Philosophers disagree about what personal autonomy involves—for a review of the major positions, see Buss (2014)—but we may say that autonomous decisions are caused by agents, or are at least made in accordance with reasons agents can endorse. However, we need not travel too far into the weeds of debates about autonomy for the purposes of this paper, but can instead reflect on the conditions of informed consent, since informed consent is the primary means by which patient autonomy is protected in healthcare decision-making (Faden and Beauchamp 1986). Medical interventions receive informed consent when informed and competent patients voluntarily consent to them.

There are many reasons why a patient's consent to a procedure may not qualify as informed consent. For example, if a physician lies to a patient—or otherwise deceives her—then the patient's consent may be insufficiently well-informed. And if a physician uses coercion—by threatening harm if the patient is noncompliant—then the patient's consent may be insufficiently voluntary. But nudges do not usually involve deception or coercion. Instead, if nudges undermine autonomy it is because they involve manipulation (Ploug and Holm 2015). Nudges may be manipulative because they use unconscious cognitive processes to sway our decisions. Nudges exploit “nonrational elements of psychological makeup or...[influence] choices in a way that is not obvious to the subject” (Blumenthal-Barby and Burroughs 2012, 5). Manipulated consent may be inconsistent with informed consent, since a manipulated decision may not be fully voluntary.

Advocates of nudging in healthcare contexts have two responses to the charge that nudges are manipulative. One option is to deny that nudges are manipulative. Unfortunately, this sort of defense requires engaging in larger debates about nudging and autonomy (and informed consent). Among other things, we must consider whether different kinds of nudges undermine autonomy to different degrees. For example, framing and default nudges may undermine autonomy more than some kinds of pre-commitment nudges do. And getting the facts and moral arguments right regarding the autonomy-compromising power of particular nudges requires much more work than can be done in this paper. (For example, a recent research paper attempts to resolve these questions just for different kinds of framing nudges (Chwang 2016).) Also, manipulation and autonomy are contested concepts (as is the related concept of informed consent). Whether particular nudges manipulate in ways that undermine autonomy (or informed consent) may depend on which version of those concepts is the right one (Ploug and Holm 2015). A short article, such as this one, cannot hope to resolve these debates.

Until we have a clearer sense of whether and how particular nudges undermine autonomy, a second strategy for defending pediatric vaccination nudges may be more fruitful. We might be able to justify these nudges if we could show that infringements on autonomy are outweighed by the benefits of nudging. This sort of argument requires both an account of the value of autonomy for a particular kind of decision (and, therefore, the *dis*value of infringements on autonomy), as well as an account of the benefits of the nudge. At one extreme, autonomy-undermining nudges may be morally unproblematic in contexts in which autonomy (and the related process of informed consent) is not important, because in these contexts

autonomy-undermining nudges would have no moral costs. For example, Chwang (2015) claims that it is morally unproblematic for people selling bicycles to nudge their customers, since informed consent is not required in decisions about whether to purchase a bicycle (though, of course, *consent* is necessary in these transactions). In healthcare contexts, however, autonomy (including informed consent) is centrally important. So, healthcare nudges that undermine autonomy (and informed consent) may impose real moral costs, unlike bicycle-selling nudges. Therefore, if autonomy-undermining healthcare nudges are morally permissible, it is because those nudges promote goods that compensate for the moral costs of undermining autonomy.

I suspect that this second strategy for defending nudges will fail to justify most healthcare nudges. The autonomy of adult patients (and older child patients) is especially valuable, and not easily outweighed. Also, most of the benefits of most healthcare nudges accrue to the nudged patient; most healthcare nudges are primarily paternalistic. And paternalism is not a very weighty reason to undermine the autonomy of adults, especially in healthcare contexts.

There are two reasons to think that pediatric vaccination nudges are more likely to be ethically justified than other kinds of autonomy-undermining healthcare nudges. On one hand, pediatric vaccination promotes especially valuable goods. Like most healthcare nudges, pediatric vaccination nudges promote the health of the patient, but these nudges *also* protect the health of other members of the community. These are people who would have been vulnerable to infection if the child patient were not vaccinated. On the other hand, autonomy-undermining pediatric vaccination nudges may not impose as significant a moral cost as do other autonomy-undermining healthcare nudges. This is because pediatric vaccination nudges usually undermine the autonomy of *parents*, and parental autonomy in pediatric decision-making is not as morally valuable as the autonomy of adult patients, which is the traditional locus of concern about autonomy in healthcare contexts. I develop both of these arguments in the following sections.

Before proceeding, it may be helpful to note that I am not committed to any particular account of the value of autonomy, or of autonomy's commensurability with other values. But I hope it is not too controversial to assume the following: autonomy is not the only important value in healthcare decision-making contexts; justice, beneficence, non-maleficence, and respect for human rights matter, too. And autonomy is not of absolute value in healthcare decision-making contexts, since nothing is so valuable that we should be willing to sacrifice everything else to protect it. This is to say that other values may sometimes outweigh the disvalue of diminished autonomy. At the extreme, massive violations of autonomy (even of adult patients) may be permitted to prevent people from significant risks of serious harms. For example, coercive quarantine may be justified to control ongoing outbreaks of deadly diseases. And if we accept a principle of proportionality, then we should think it is ethically permissible to use less autonomy-undermining means (e.g., manipulative nudges) even to promote less valuable goods than ending ongoing outbreaks of deadly diseases. In particular, I will argue that the goods generated by vaccination may justify the use of autonomy-undermining pediatric vaccination nudges.

## Nudging for the Sake of the Vaccinated Child

Physicians have a moral reason to act in ways that promote their patients' interests. This is especially true when a physician's patients are children, who rely on others to promote their interests. Routine vaccination is usually in a child's interests. Therefore, physicians have a moral reason to act in ways that cause their child patients to become vaccinated. If nudges make it more likely that parents will choose to vaccinate their children, then it follows that physicians have a moral reason to nudge parents to choose to vaccinate their children. But do considerations about children's interests justify vaccination nudges?

There are two ways to affirm that a child's interests in vaccination could justify pediatric vaccination nudges that undermine parental autonomy. First, advocates of pediatric vaccination nudges could claim that parental autonomy is valuable only instrumentally, for the promotion of children's interests. This is a common way to account for the moral value of parental autonomy in healthcare decision making, e.g., Birchley (2016), and the AAP Committee on Bioethics seems to have endorsed this account in a 1995 statement (AAP Committee on Bioethics 1995). (In contrast, a 2016 AAP statement appears to embrace a broader account of the moral value of autonomous parental decision-making (Katz et al. 2016).) If parental autonomy is valuable only because it promotes children's interests, then parental autonomy is not morally valuable when it leads to vaccine refusal, on the assumption that routine vaccination is in children's interests. Therefore, even if pediatric vaccination nudges undermine parental autonomy, it follows that these infringements on parental autonomy are not a moral loss. And the moral case for autonomy-undermining pediatric vaccination nudges could therefore be easily made, since these nudges would realize great benefits while imposing no moral costs.

I think this account is largely correct, though it conceives of the value of parental autonomy in pediatric decision-making too narrowly. There are other reasons to care about parental autonomy, i.e., other than because of its usefulness in promoting children's interests. Parental autonomy is also good for parents, for parent-child relationships, and for the family (Brighouse and Swift 2014; Nelson and Nelson 2014). A parent's life may go better—and her relationships with her children and her spouse may be stronger—if she is empowered to make decisions about her children's healthcare. So, if pediatric vaccination nudges undermine parental autonomy, they may sacrifice something of moral value, even on the assumption that vaccination is good for children. Therefore, someone who defends autonomy-undermining pediatric vaccination nudges has the responsibility to show that the benefits of these nudges outweigh the costs. This should not be a difficult a task, since it seems doubtful that one-off interventions in the pediatrician's office will undermine parental autonomy in ways that jeopardize the goods that parental autonomy provides to parents and the family. Vaccination nudges seem unlikely to undermine the intimacy and spontaneity that parental autonomy contributes to family life. For example, vaccination decision-making seems unrelated to decisions about which bedtime stories to read or which sports to encourage children to play. Therefore, even if autonomy-undermining pediatric vaccination nudges impose real

moral costs on parents and the family, these costs may be negligible and therefore easily outweighed.

Importantly, we should not defer to parents' beliefs about the value of parental autonomy, the value of childhood vaccination, or the relationship between these values. Parental convictions are insufficient to establish the moral worth of parental autonomy or (the moral weight of) their children's interests (Dawson 2005). Even if we endorse a subjective account of value (which I do not), it seems clear that the relevant *subjects* also include the (un)vaccinated child and other members of the community, in addition to the parents. So, the mere fact that particular parents may think that it is especially important for them to make autonomous decisions about their children's healthcare—even at a cost to their children's well-being—does not make it so.

The negligible moral costs of autonomy-undermining pediatric vaccination nudges seem to be outweighed by the benefits of childhood vaccination to the vaccinated child. But completing this argument in specific cases requires more information. On one hand, we need evidence about the benefits of particular vaccines for particular children. Most vaccines promote the interests of most children, but there are important exceptions. For example, some vaccines (on standard schedules) may not promote some children's interests at all, e.g., hepatitis B vaccine given to hours-old infants born to HBsAg-negative mothers (Conis 2015). And among the vaccines that do promote a child's interests, they do so to different degrees; chicken pox is not polio. Furthermore, most vaccines will do more to promote a child's interests when herd immunity is vulnerable or non-existent than they will when herd immunity is robust.

On the other hand, we will need more evidence about whether (and how) particular nudges undermine parental autonomy. I take myself to have shown that parental autonomy in pediatric decision-making is not especially valuable, aside from its ability to promote the interests of the child. But even if my argument is less successful than I have supposed, we may conclude that autonomy-undermining pediatric vaccination nudges are more likely to be ethically justified if they do less to undermine parental autonomy. For example, if a particular pediatric vaccination nudge causes only minimal infringement on parental autonomy, but will do a great deal to promote a vaccinated child's interests, then it seems more likely that the interests of the vaccinated child will suffice to ethically justify this nudge. In contrast, if another pediatric vaccination nudge causes significant infringement on parental autonomy, but does not do much to promote the vaccinated child's interests, then it seems less likely that the interests of the vaccinated child will suffice to ethically justify this nudge.

Before moving on, it may be helpful to clarify that I have not provided a general defense of autonomy-undermining paternalistic nudges, in healthcare contexts or otherwise. My arguments apply only to nudges that target parental decision-making (and, therefore, may undermine parental autonomy). This is because autonomous parental decision-making has little moral value when it does not promote the interests of the child. So, if my arguments in this section have broader consequences, those include only cases in which parents are nudged to promote

the well-being of their children, e.g., daycare centers or hospitals using nudges to encourage parents to practice proper car seat installation.

## **Nudging for the Sake of Others**

Vaccination decisions have consequences for other people, since unvaccinated children are at greater risk of infecting others. Do other people's interests in avoiding infection provide physicians with a moral reason to nudge parents to vaccinate their children?

It seems clear that other people's interests may affect how a physician treats their patients (or their patient's parents). For example, physicians are morally permitted (even morally obligated) to support quarantine during outbreaks for patients who are asymptomatic carriers, based on the community's interest in avoiding infection. More generally, a physician has a moral reason to practice medicine in ways that do not place other people at an avoidable risk of significant harms. This includes protecting other patients from the risks that vaccine refusers impose on them (Block 2015). (Consider that the 2008 San Diego measles outbreak began when an unvaccinated child—of vaccine refusers—infected other children in a physician's waiting room (Sugerman et al. 2010).) And the same responsibility that gives physicians a reason to protect other patients from becoming infected in the clinic waiting room also gives physicians a reason to protect non-patients from becoming infected in the elevator of the office building in which the clinic is located, or in classrooms at the local school.

The pressing question is whether (and when) other people's interests in avoiding infection trump parental autonomy in decisions about childhood vaccinations. In the previous section, I argued that parental autonomy has negligible moral value when it is exercised in ways that impose costs on a child. This is because the chief reason to value parental autonomy is for its usefulness in promoting children's interests. In contrast, the fact that parental autonomy fails to promote the interests of *other* people is often insufficient to justify infringements on parental autonomy. (Of course, in the case of pediatric vaccination, the interests of both the vaccinated child and other people are relevant. The point of this section is to identify whether the interests of other people provide additional reasons for autonomy-undermining pediatric nudges, beyond the reasons grounded in the interests of the vaccinated child.)

The mere fact that pediatric vaccination nudges could reduce the chance that someone else will be infected is not enough to ethically justify infringements on parental autonomy. Parents are generally free to make many choices that impose risks of harms on other people. For example, if parents drive their children to school, even when they could have walked them to campus, they thereby impose an avoidable risk of serious harms on pedestrians and other motorists. I assume most people think parents have a moral right to make this sort of choice about how to transport their children. Also, I assume many people would object to autonomy-undermining efforts to increase the number of parents who walk their children to school, even if these efforts would make pedestrians and motorists safer.

But there are limits to the (risks of) harms that one person's parenting choices may impose on another person. In particular, a parent does not have a moral right to impose significant risks of serious harms on other people. (They are not entitled, for example, to let their children shoot guns in their suburban backyards (Flanigan 2014).) But many instances of vaccine refusal do not impose this kind of risk on other people. For example, tetanus is not contagious, so refusing tetanus vaccine does not impose *any* risks on others. For another example, human papillomavirus (HPV) and hepatitis B are usually transmitted through sexual activity or intravenous drug use, such that refusing vaccines against these diseases does not *impose* risks on others in the way that refusing a vaccine for an airborne disease imposes risks (Luyten et al. 2014; Malm 2015). Furthermore, when vaccination rates are high—and herd immunity is robust—an individual parent can refuse any number of vaccines without imposing significant risks of serious harms on others (Diekema and American Academy of Pediatrics Committee on Bioethics 2005). In these cases, pediatric vaccination nudges will gain support from considerations of other people's interests only if those nudges cause at most minimal infringements on parental autonomy.

In contrast, when vaccination rates are relatively low, or when vaccine refusal is geographically-clustered (even in the face of high overall vaccination rates), vaccine refusal may impose significant risks of serious harms (Lieu et al. 2015; May and Silverman 2003). In these cases, the interests of other people are likely to lend greater support to pediatric vaccination nudges that undermine autonomy.

## Nudging for the Sake of Fairness

Some people object to vaccine refusal on the grounds that it is unfair (Chervenak et al. 2015; Spier 1998). They think that parents who do not vaccinate their children may take advantage of the community's protection from disease (herd immunity) without contributing to that protection. I am sympathetic with the claim that vaccine refusal can be unfair (Navin 2013a), but I do not think that this consideration tells in favor of autonomy-undermining pediatric vaccination nudges.

Fairness is a distinct moral consideration. It does not reduce to a commitment to harm prevention, since there are harmless ways to take uncompensated advantage. For example, assume that it can sometimes be unfair to avoid paying taxes. But if one person unfairly avoids taxes to save a small amount of money (e.g., \$100), this unfair act is extremely unlikely to harm any individual person who relies on federal government programs, since the shortfall represents an infinitesimally small percentage of the federal budget. Likewise, a single instance of vaccine refusal may be relatively harmless when herd immunity is robust, but it may still be unfair, since the unvaccinated child may take uncompensated advantage of the herd immunity that others have created (Dawson 2007; van den Hoven 2012). Does a commitment to avoid this sort of (potentially harmless) unfairness count in favor of pediatric vaccination nudges, as some (e.g., Buttenheim and Asch 2013) have suggested?

I do not think that considerations of fairness contribute to the case for autonomy-undermining pediatric vaccination nudges. Herd immunity is a political project. It is a valuable goal at which state and national governments have dedicated billions of dollars over many decades. If we have a duty of fairness to contribute to herd immunity, then it is because political morality requires that we make fair contributions to (some) valuable political projects that our governments have pursued (Navin 2015). And if physicians have a moral reason to nudge people to make fair contributions to herd immunity, it is because physicians have a moral reason to nudge people to fulfill the requirements of political morality.

This sort of argument seems unlikely to succeed. First, members of a society may not have a political duty to contribute to (all of) the valuable public projects pursued by their governments. In the absence of explicit consent, the mere fact that one's government has chosen to pursue a valuable program may not generate a duty to contribute (Nozick 1974).

But even if citizens have a duty to make fair contributions to the valuable projects pursued by their governments, it seems unlikely that physicians have a moral reason to treat their interactions with patients (or their parents) as a way to enforce this political duty. The physician-patient relationship is not fundamentally a political relationship. And it is inconsistent with the ethos of the professional relationships that physicians have with their patients for physicians to treat patients as instruments for promoting political projects. To be clear: it is part of a physician's professional responsibilities to practice medicine in ways that are not harmful to members of the community, as the previous section discusses. But a professional obligation to practice socially responsible medicine stops short of a duty to enforce fair contributions to essentially political projects.

Consider another example of a political project that citizens may have moral reasons of fairness to support: national defense. Physicians should not nudge patients to join the military, even if members of society have a moral duty to join the military (or otherwise support national defense). If anyone has the right to wield autonomy-undermining power to promote national defense, it is representatives of the state (who are accountable to the people they govern), and not private actors acting on personal initiative. So, to return to the case of vaccination, public health officials and school district representatives might be morally entitled to use a combination of coercion and nudges to incline parents to vaccinate their children for the sake of promoting fair contributions to herd immunity (Constable et al. 2014; Verweij and van den Hoven 2012). However, it would be wrong for physicians to undermine parental autonomy in pediatric decision-making for the sake of promoting a fairer distribution of the costs of herd immunity.

But perhaps vaccination blurs boundaries that are clear in other cases. Even if there is generally a well-defined divide between professional and political relationships—and even if relationships between parents and their children's physicians are usually professional relationships—interactions surrounding vaccination may avoid easy categorization. For example, public health officials incentivize providers to vaccinate their patients in order to meet political vaccination goals, and some states require parents to discuss vaccines with their children's physicians as part of the process for becoming eligible for exemptions to

school or daycare vaccine mandates. Interactions between physicians and their patients' parents about vaccination therefore take place against the background of ongoing political projects that aim at promoting herd immunity. Does this give physicians moral permission to undermine parental autonomy to promote herd immunity?

No. It is fallacious to reason from the fact that physician-patient interactions take place against the background of political efforts to promote herd immunity to the conclusion that physicians have a moral right to treat their interactions with patients as a means for promoting herd immunity. Participants in a system often have good reasons *not* to act to promote the goals of the system. Consider the relationship between a criminal defendant and her attorney, which takes place against the background of a system that aims at convicting and sentencing (only) guilty people. Suppose a criminal defense attorney is justifiably convinced that her client is guilty, even though her client is very likely to be acquitted if the attorney adequately defends her. Does the fact that the attorney-client relationship takes place against the background of a system that aims to convict (only) the guilty give the attorney a moral right to nudge her client to confess? No. While the broader system aims to convict the guilty, a defense attorney has a professional obligation to defend her client, rather than aim at the conviction of guilty people. Much the same can be said about physician-patient interactions when it comes to vaccination. Even if it is correct to characterize these interactions as part of a (political) system that aims at promoting herd immunity, it does not follow that physicians may undermine parental autonomy to promote fair contributions to herd immunity. In particular, doing so would violate a physician's professional duties.

## Conclusion

I have argued that autonomy-undermining pediatric vaccination nudges may be ethically justified, and that they are more likely to be ethically justified than other autonomy-undermining healthcare nudges. This is because the moral value of parental autonomy is negligible when it is exercised in ways that fail to promote the interests of the child, and because a child's interests in being vaccinated are likely to be sufficiently weighty to compensate for the limited moral costs impose on parents. Also, vaccination promotes the interests of other people, and interests of other people in avoiding infection may also sometimes be weighty enough to compensate for infringements on parental autonomy caused by pediatric vaccination nudges.

The arguments in this paper outline a defense of autonomy-undermining pediatric vaccination nudges, but we need much more information to flesh out these arguments. For example, additional empirical research will tell us more about how particular nudges can promote vaccine compliance. Here, Opel et al.'s research on the effectiveness of default nudges points us in the right direction.

We also need to learn more about the longer-term consequences of pediatric vaccination nudges. For example, we know that parents do not expect physicians to nudge them, but instead anticipate open-ended discussions with physicians about vaccines (Benin et al. 2006). If dissatisfied parents are more likely to refuse vaccines

in future office visits, then this is a reason not to use pediatric vaccination nudges. Also, we may wonder whether parents will place less trust in physicians if they discover that physicians are nudging them. On this point, some have worried that nudges and other persuasive techniques may “lead to parents avoiding future vaccinations if they felt their trust in the physician had been violated” (Shaw and Elger 2013, 1690). There is good evidence that breakdowns in trusting relationships between physicians and parents contribute to vaccine refusal (Larson et al. 2011; Navin 2013b). It would be ironic if pediatric vaccination nudges were ultimately counterproductive because they undermined parental trust in physicians. So, we should hope that future research will shine light on the longer-term consequences of pediatric vaccination nudges for parent-physician relationships.

Finally, there is good reason for the American Academy of Pediatrics to develop guidelines for the use of nudges in pediatric practice and, in particular, for the use of pediatric vaccination nudges. This article began with the observation that many physicians disregard AAP guidelines about dismissing vaccine refusers. It closes with a call for the AAP to provide guidance to physicians who are considering using nudges to promote vaccine compliance among the vaccine hesitant (and vaccine refusing) parents who they have allowed to remain in their practices.

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