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Nudging towards a healthier life?

Conceptualising the role of health apps and wearables between empowerment and manipulation

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What once has been thought, cannot be taken back.
(Friedrich Dürrenmatt, *The Physicists*)

In Dürrenmatts play, the physicist Möbius has discovered the world formula and is afraid of its destructive potential, which poses a threat to global security. In order to ensure that his dismal discovery will not become harmful, he checks into a lunatic asylum. Tragically, his plan fails and his discovery falls into the wrong hands, which leads him to resignation and to the above-quoted insight. The lesson to be drawn from this play is that technological innovations have a huge influence on individual and social behaviour and that we cannot stop new technology from being used. However, we have the possibility to establish forms of public governance, ensuring that innovation works for the individual and common good. Health apps and wearables may appear to be a comparatively minor innovation, but they have the potential to change our society significantly, and the widespread use of this technology reminds us that it is high-time to analyse its potential, ranging from empowerment to the manipulation of users.

Starting from the interpretation that health apps are nudges that change the contexts in which users make health-related decisions, we address the question of whether consumers feel in control of these nudges. Are health apps controlling consumers according to underlying economic interests, or are apps empowering users by providing a self-correction tool promoting human agency and genuine freedom of lifestyle choice (Sunstein 2015)? Are they appropriate tools for nudging users towards healthier lifestyles, or is a differential consumer protection strategy required?

1 Libertarian paternalism: nudging consumers through health apps?

1.1 Defining libertarian paternalism

Economic theory acknowledges that the homo oeconomicus, or rational actor model, with the underlying assumptions of rationality, stable preferences and utility maximisation, is only a reference model for analytical purposes. Real human behaviour is different in many respects, as social psychology and sociology shows in different contexts. Moreover, empirical evidence of systematic divergence from the homo oeconomicus is provided by behavioural economics (for example: Shafir 2013; Schulz/Thöni 2013). The policy implications of these insights are new forms of governance that take real human behaviour into account. The most influential behaviourally informed approach to the regulation of human behaviour is libertarian paternalism. Paternalism, because it is based on behavioural insights, concludes that humans need more guidance than the rational actor model would prescribe. Still, this approach is libertarian in the sense that it endorses normative individualism. Ultimately, the individual should still be in the driver's seat, making decisions. Libertarian paternalism only alters the context of decision-making; it builds entire choice architectures in order to steer those individuals who lack time, information or cognitive capacity towards making good choices. In the words of the fathers of this new movement of libertarian paternalism, choice architects are 'self-consciously attempting to move people in directions that will make their lives better' (Thaler and Sunstein 2008, 6). To this end, they use nudges, which they define as 'any aspect of the choice architecture that alters people's behaviour in a predictable way without forbidding any options or significantly changing their economic incentives' (Thaler and Sunstein 2008, 6). This defines nudging as a type of regulation by contrasting it with other forms of regulation that are coercive, such as laws prohibiting drugs or involving financial (dis-)incentives, for example, getting a parking ticket. These latter forms of regulation are not nudges, but they are frequently discussed in the context of nudges, because they constitute regulatory alternatives. Regulation is not necessarily public

regulation. The private and the public sector can use nudging, and frequently decisions are made against the background of various overlapping or simultaneous nudges that are in place.

A prominent, highly relevant example of a choice architecture in the context of consumer protection is the revised EU tobacco directive, according to which the harmful effects of smoking have to be visualised on the cigarette packs according to standardised formats (Böning and Maier-Rigaud 2016, 253–254). Hence, libertarian paternalism uses expert knowledge to build choice architectures that make individual consumer choices easier, allowing for shortcuts that relieve individuals from complex information-gathering and decision-making processes, but ultimately retaining individual freedom of choice. This is achieved by a mere alteration of choice contexts, instead of addressing choices directly. Therefore, this kind of intervention is also described as soft paternalism, contrasting the concept with traditional paternalism based on commands and prohibition.

1.2 Critical aspects of the nudging controversy

The general discussion about nudging and libertarian paternalism is extremely controversial, not least because of the important public policy implications it carries. Two pivotal aspects are, whether nudges are manipulative and who is legitimately allowed to nudge.

Despite the labelling of nudging as a softer form of paternalism, some authors see a danger that nudges intentionally manipulate decision-making in a non-transparent fashion (e.g. Schnellenbach 2014, 781), and they therefore prefer classic forms of paternalism. Ultimately, the issue of manipulation is contingent upon the definition of manipulation (Drerup and Dessauer 2016, 374). Transparency is certainly a key element of democratic public governance; however, it is also clear that there is no such thing as a real world choice without any choice architecture or institutional arrangements structuring or nudging individual behaviour (Sunstein 2014, 584; Drerup and Dessauer 2016, 377). Rather, the real world is characterised by an omnipresence of forms of hard paternalism that should be viewed as a reference point when discussing regulatory interventions (Funk 2014, 791). Against this background, we can conclude that there is certainly a continuum of more or less manipulative

nudges (Drerup and Dessauer 2016, 391), and that nudges, like any regulatory intervention, require transparent justification. This leads to the second main criticism discussing the legitimacy of choice architects.

A fundamental critique of nudging relates to the question of who the legitimate choice architects are and how they know what is best for consumers. In the context of health, this is particularly controversial, as medical evidence and social norms both play an important role. Ultimately, it is not a viable solution to refrain from building public choice architectures, because this would simply strengthen the status quo (Schmidt 2014, 344). Indeed, as mentioned above, the structuration of our decision-making environment is omnipresent and partly manipulative if we think, for example, about marketing strategies. The private sector is much less hesitant about using nudges. Referring to the public choice literature, one could argue that nudges should not be used by the state, because public institutions may not use them in a benevolent way (Rebonato 2014, 389–390). However, abuse is always a risk that comes with governance tools and not an argument against the tools per se; rather, it is an argument for the division of power and a carefully designed democratic political system. Furthermore, as Drerup and Dessauer (2016, 377–379) point out, a problematic double standard is applied by many critics of nudging, showing more confidence in nudges used by a profit-oriented private sector than in nudges used by public policy. This contrasts with the attitudes of consumers towards nudging in the realm of health behaviour: there is a consensus among consumers to approve nudges that promote the health and well-being of consumers and balancing opposed efforts by profit-oriented companies (Junghans, Cheung, and De Ridder 2015, 10).

2 Nudging through health apps

2.1 Promoting health and well-being through health apps

One possibility in terms of promoting health and well-being are health apps—software applications for smartphones and tablets changing those small devices into special tools for health, wellness, fitness and medical purposes (Albrecht 2016, 15). Offering features such as self-tracking and displaying of health outcomes, they change the context in which users make health-related decisions, probably motivating them to improve the outcomes displayed by their app.

Health apps belong to the 'mHealth' (mobile health) field, which is a—not yet clearly defined—component of eHealth and can be understood as 'medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices' (Albrecht 2016, 14; Kay, Santos, and Takane 2011, 6). To define health apps, Albrecht et al. (2015) consult the WHO's definition of health as 'a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity' (WHO, 1946). According to this definition, apps intending to positively influence physical, mental and social well-being can be defined as 'health apps'. Health apps that specifically intend diagnostic or therapeutic purposes, and thereby 'cover key areas of medicine', should, however, be categorised as 'medical apps' (Albrecht, Pramann, and von Jan 2015, en8).

Thus, health apps are supposed to address healthy users to support a healthy lifestyle—while patients and professionals would probably rather use medical apps, for example, to cope with a chronic disease or for clinical decision support. App stores also distinguish between the two categories 'health and fitness' and 'medicine', but since the manufacturer decides which category the app is offered in, this does not necessarily correspond to the objective classification of the app (Kramer 2016; Free et al. 2010, 1).

2.2 Applying the concept of nudging to health apps

Manipulative purposes and a lack of transparency are extremely important issues to be addressed when discussing the role of health apps in society. Thus, applying the concept of nudging to health apps requires a concretisation: nudging can take place on three levels.

First, using a health app is a kind of self-nudging: individuals use technology in order to lead a more self-determined and healthy life. This kind of self-nudging is different from other strategies such as self-binding behaviour, because self-binding is not liberty-preserving. Since it constitutes a commitment to a certain behaviour in the future, self-binding strategies trade future freedom of choice for certainty about one's future behaviour.

By contrast, nudging is essentially defined through its libertarian element to retain individual freedom of choice. So, even in the case of self-nudging, the individual changes the choice architecture for future decisions but still decides in the future. If I use an app to remind me to go running, I can still decline every time I receive a reminder, but it probably helps me to go running more frequently and regularly. In this sense, a health app is a tool like a GPS that helps consumers to make good and efficient choices without undermining human agency (Sunstein 2015, 207). However, the two strategies have a common aim, namely to self-impose the attainment of higher order or meta-preferences and to defend oneself against human weaknesses of the will. Thus, health app users are becoming their own choice architect by choosing and personalising the health apps they use.

Second, as outlined below, health apps are private, largely unregulated goods that potentially influence users' behaviour. Beyond self-nudging by a health app that reminds you to drink water, go running or take a medication, the app is used, but not developed, by the user. The supplied health apps differ in many respects, but there is a common feature, which is that they use the fact that we are social beings and nudge us by making comparisons with our previous health results or with the results of our peers. Health apps and, in particular, fitness apps nudge by comparison. This comparison is presented in a playful and competitive way. They have the potential to generate physical norms without a sound and transparent evidence base. Therefore, self-track-

ing through the use of health apps, and self-quantification more generally, constitute a modern form of behavioural norm generated by individual health data (Kuhn 2014, 58) and based on commercially defined parameters and user surfaces. Thus, nudging in the context of apps is about nudging by commercial interests of the private sector selling specific apps to users. Those principally differing interests between those selling apps and those buying and using apps are not necessarily reconciled through market forces alone. As in many other areas where the invisible hand of the market is supposed to rule, there are attempts to regulate.

Protecting consumers against the commercial use of nudges constitutes a potential third level for nudging (Bruttel and Stolley 2014, 771): besides traditional forms of regulation such as prohibition or financial (dis-)incentives, public regulation could set defaults for the use of apps, such as labels signalling important differences between apps to consumers and also differentiating between health apps and lifestyle apps. This would potentially constitute an important choice architecture for consumers.

3 Consumer protection

3.1 Status quo of health app market

The market for health apps is growing rapidly, including 231,000 apps in 2016 within the categories 'health and fitness' and 'medicine' from the two leading app stores of iOS and Android, with a worldwide market revenue that reached approximately 12.5 billion US$ in 2016. Health apps predominantly focus on the chronically ill, persons interested in health and fitness, and physicians. The main revenue sources are services such as remote diagnosis based on submitted photos, and hardware sales such as specific medical devices designed to be used with the app. In 2013 one-third of health apps were fitness apps tracking fitness or guiding exercises. The second and third largest groups, each accounting for around 16 per cent, were apps providing medical

information and advice, for example, about symptoms, and wellness apps that give yoga instructions, for example. Nutrition apps that help to track diets or provide information about nutrition facts, and medical condition management apps represented the next largest groups of health app, each with a share of around 7 per cent. Medical condition management apps track and display health parameters or drug intake. In 2016 one-third of app manufacturers presumed that such apps would offer the greatest market potential over the next five years, along with diagnostic apps and remote monitoring apps (research2guidance 2014, 7–17; research2guidance 2016, 11–26).

Health apps offered by health insurance are of special interest. In a study of the Hannover Medical School from 2016, 60 health apps were identified, offered by 29 of 127 different German statutory health insurers or their associations. Here, apps for health promotion and prevention—potentially nudging users towards a healthy lifestyle—formed the second largest group (20 apps). The authors only found one app that collected data within a bonus program. However, according to a survey of health insurance, which formed part of the study, three apps providing incentives within bonus programs were planned at this time. Only for one other app was it mentioned that the entered data was collected (Aumann, Pramann, and Frank 2016, 248–256).

3.2 Legal framework

Data use and protection is a particularly critical issue associated with health apps. According to § 284 of the Social Code Book V (SGB V), statutory health insurers have limited possibilities to survey and save the personal data of their insurees, and they are not allowed to create risk profiles of individual insurees. Thus, when offering health apps, they actually need an intermediary who analyses and anonymises the collected data of an app for the health insurance. In general, data protection provisions of the Federal Data Protection Act (BDSG) have to be respected. Furthermore, apps that include fee-based services are also subject to the Telemedia Act (TMG), which determines the information obligations of the manufacturer, for example, in the form of an imprint (Pramann 2016, 230–231).

Moreover, in Germany medical apps are subject to the Act on Medical Devices (MPG) if they are medical products based on the legal preconditions described in § 3 (1) MPG. According to this provision, the manufacturer decides about the intended purpose of an app and thereby on its potential status as a medical product. Medical purposes are, for example, diagnosis, treatment of diseases, or investigation of a physical process—which could be realised by app features such as calculation of dosing of medicines, or monitoring patients and collecting data, for example, using measurements. In other words, 'any type of interference with data or information by the stand alone software is indicative of a classification as a medical device' (BfArM 2015).

In case a medical purpose exists—according to the labelling, the instructions for use or the promotional material—a certification is mandatory in order to place them on the market and into operation. However, non-professional manufacturers are not always conscious of developing a medical product, and thus, do not always comply with the requirements. Apparently, the market for certified medical apps so far is small: in March 2016 HealthOn e.V. counted 10 certified medical devices among German-language apps in the Google play store (Kramer 2016). However, the number of uncertified apps is probably high as a result of the unawareness and probably unwillingness of app manufacturers. The *Guidance on Medical Apps* published by the Federal Institute for Drugs and Medical Devices wants to provide orientation for manufacturers in terms of the clear classification of apps and with respect to the resulting legal consequences (Pramann 2016, 228–230; BfArM 2015).

3.3 Potential consumer protection measures

Obviously, health apps can be divided roughly in two groups, depending on whether or not they serve medical purposes. Consequently, this has to be taken into account regarding the future need of consumer protection measures. With respect to medical apps, the real figures need to be explored, and accordingly, the manufacturer's compliance with respective laws and regulations. However, their risk classification also needs to be verified on the basis of an app's security and its harm potential, such as false diagnoses (Pramann 2016, 242; Albrecht, Pramann, and von Jan 2015, en8f).

So far, the barrier to using health apps seems to have been low: most people use smartphones, the choice of apps is large, and the monetary and non-monetary costs (such as installation and usability) are generally low. Hence, usage is intensifying and spreading, becoming a central aspect of contemporary social change. However, users are most likely not aware of the classification of health apps and the underlying conditions. The intended effects of the app use are important for them, but the unintended and maybe implicit effects are also relevant for consumer protection. Both medical and health apps pose a danger to the privacy and integrity of health-related data. Thus, any interference with the data indicating the use of a medical device, as well as any form of choice architecture indicating the intention of nudging, should be visualised for consumers.

Unfortunately, user information enabling the evaluation of the personal benefits and risks associated with an app is rarely available. Users usually inform themselves solely via user comments in app stores or blog posts, where little information is given on the reliability of the sources. The same applies to certificates that can be obtained from private initiatives. Moreover, the existing laws and regulations only apply to medical apps. Albrecht, Pramann and von Jan (2015) therefore propose that manufacturers provide information to users in a comprehensive and comprehensible way, for example, in the form of an app synopsis published directly in the app store and on their homepages. Moreover, as an easy usable tool they suggest a structured list with important points that users should take into account, such as the imprint of an app, a description of the intended purpose, the target audience, functionalities and their restrictions and limits (Albrecht, Pramann, and von Jan 2015, en7–10).

Nonetheless, this requires users with a higher degree of health literacy, or rather consumer competence, in order to understand the information provided. Moreover, the need and willingness to make the effort to evaluate an app probably exist for users of medical apps rather than users of health and fitness apps. The latter are designed to positively influence physical, mental and social well-being, and are therefore rather used by healthy people interested in their physical condition and in health promotion. They want to know more about their health parameters and search for motivation to stay on track with their fitness programmes—potential harm is less obvious than for medical apps. Thus, health app users are presumably less likely to search for consum-

er information, although those apps bear at least the same danger as medical apps in terms of the privacy and integrity of the health-related data.

Health and fitness apps, however, pose a more implicit risk. The chance of nudging consumers towards healthy behaviour encompasses the positive side-effect of strengthening self-determination and individual responsibility. However, it also poses the risk of manipulating consumers and externally controlling them, as well as fostering individualisation, in terms of not only increased individual responsibility but also decreased solidarity within the statutory health insurance. A YouGov study showed that 32 per cent of the German population can, in principle, imagine measuring health- and fitness-related data and sharing it with their health insurer in order to receive advantages (YouGov 2015). This is consistent with a study conducted by the Hannover Medical School, which found indications that apps offered by health insurers, especially within bonus programmes, will gain importance (Aumann, Pramann, and Frank 2016). However, advantages for healthy people can in turn be seen as disadvantages for less healthy people who are not able to receive such bonuses. Moreover, bonuses can only be achieved when insurees accept the use of health apps and the sharing of their health data. This might put pressure on insurees to use such technologies. Finally, the use of such technologies facilitates the comparison of health-related data and might increase the social pressure to be healthy, or rather, to prove one is living a healthy lifestyle. However, eHealth literacy, which is defined as 'the ability to seek, find, understand, and appraise health information from electronic sources and apply the knowledge gained to addressing or solving a health problem' (Norman and Skinner 2006, 2), is lower for patients with chronic conditions, perhaps because of their older age and lower socio-economic status (Fox 2007; Paige et al. 2017, 320).

4 Conclusion

Against this background, providing more and better consumer information is warranted but not sufficient. A broader debate is required, discussing the role of consumers, the government and health insurers in the regulation of health apps. Health apps constitute a nudge. If it is left to commercial nudging, the societal implications are unforeseeable. In order to put consumer interests in the driver's seat of technological progress, we need statutory health insurers and governments to be at the centre of regulation, using conventional instruments and nudges as regulatory tools.

To this end, we need a better empirical understanding of health app user behaviour. Empirical research suggests that whether health apps are viewed as empowering self-nudging tools or as manipulative and controlling consumers depends on the individual consumer (Böning and Maier-Rigaud forthcoming). Based on Riesman's classic distinction between inner-directedness and other-directedness, one hypothesis that needs to be tested is whether we find distinctive user types who need different consumer protection measures in the realm of health apps. Our intuition suggests that in our digital world of social media, smartphones and health apps, the other-directed type of consumer, as described by Riesman (1961/2001, 21) in *The Lonely Crowd*, has become dominant in our society and is highly vulnerable: 'What is common to all the other-directed people is that their contemporaries are the source of direction for the individual—either those known to him or those with whom he is indirectly acquainted, through friends and through the mass media.'

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