How to Balance Individual and Collective Values After COVID-19?

Chapter 12
How to Balance Individual and Collective Values After COVID-19? Ethical Reflections on Crowd Management at Dutch Train Stations

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12.1 Introduction

The COVID-19 pandemic has changed the way individuals have had to behave when in contact with other individuals. SARS-CoV-2 has exhibited a swift and exponential spread rate. Clusters of individuals (families, public events and gatherings, crowds, etc.) have sped up the transmission, and during 2020 they accounted as responsible for 50–80% of all reported cases (Hozhabri et al., 2020). Although the mortality rate of COVID-19 is between 2.0% and 3.8% (Hozhabri et al., 2020; Novel, 2020), which is significantly lower than previous coronavirus epidemics (e.g. SARS with ~10% and MERS with ~35%), it is still relatively high nonetheless, especially among vulnerable parts of the population: elderly, people with chronic diseases, the immunocompromised, etc.

Faced with these numbers, governments reacted by attempting to control the spread of the virus through imposing measures (e.g. social distancing, minimisation of crowds and public gatherings, mandating the wear of face masks, and others) which were assumed to be capable of lowering the transmission rate.

Virtually all these measures have asserted that collective values (should) have primacy in times of crises, in particular during the COVID-19 pandemic, and that those restrictions of individual freedoms are thus an acceptable response. Nevertheless, these measures were only temporarily successful in stopping the spread of the virus among the population, since the pandemic has resulted in several 'waves' of infections and in multiple mutations (strains), some of which have proved to be even more contagious (e.g. Delta, Omicron).

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However, this (primarily governmental) assertion towards the primacy of collective values in crises (which at times is described as emerging '(latent) authoritarianism'; see, for example, Hoxhaj and Zhilla (2021) and Thomson and Ip (2020)) has received pushback after initial public support. This, paired with the perceived general ineffectiveness (Asongu et al., 2020) and perceived needlessness or arbitrariness of the measures, and with the secondary toll of the imposed containment measures (e.g. rising depression, anxiety and suicide rates, loss of employment, traumatised interactions between people; see Sikali (2020) and Beeckman et al. (2020)), has motivated a more profound public debate on the balance between individual and collective values, and whether some belonging to one or the other group have priority in times of crises. We explore this debate in Sect. 12.2.

The pandemic has also given rise to questions on how to effectively control the behaviour of groups of people and how to use technologies for pandemic crowd control. This has added a new dimension to the discussion of crowd control technologies. For this purpose, we conduct an exploratory ethical analysis of recent sociophysics research findings from Pouw et al. (2020), which is focused on monitoring crowds on train stations. This case study is part of a research project aimed at understanding the movement of individuals and crowds within train stations to help better manage the flow of travellers e.g. in peak moments. In 2021 a research consortium was created to also include societal aspects of crowd-management with the help of psychological and ethical research.

In this chapter we present an exploratory ethical analysis of recent findings of this empirical project during the COVID-19 pandemic. The aim of this exploratory study is to identify both key research questions and initial findings that will be relevant for the further ethical investigation of collective and individual agency and the balancing of individual and collective values in crowd nudging.

We identify three important research questions for philosophy and ethics of technology that require interdisciplinary cooperation between empirical and philosophical research and present initial reflections on each of these three questions: How can we understand and conceptualise the relation between collective and individual values and agency (Sect. 12.2.1)? How should we balance individual and collective values post-COVID (Sect. 12.2.2.)? What role can and should crowd management technology play in this balancing acts (Sect. 12.2.3)? In the next section we elaborate these three aspects from a philosophical perspective, before applying these three questions to the case of crowd management at train stations., which we explore in greater detail in Sect. 12.3. below.

12.2 The Normative Background of the Current Pandemic: Collective Versus Individual Values in Times of Crises

To understand collective and individual values and their balance, we begin with a brief discussion on what values are. For our chapter, we follow the definition of values of Schwartz, developed in his *theory of basic values*. According to Schwartz,

values are "trans-situational goals, varying in importance, which serve as guiding principles in the life of a person or group" (Schwartz, 1992, 1994, 2017). Schwartz identifies 19 distinct values within 12 value factors (clusters) in this latest iteration of his theory. In addition, he identifies the properties that values must have and the dynamic functions they need to fulfil. In Schwartz's words, values "should be grounded in one or more of three universal requirements of human existence with which people must cope: needs of individuals as biological organisms, requisites of coordinated social interaction, and survival and welfare needs of groups"[1] (Schwartz, 2017).

As we can see, Schwartz keenly recognises that values pertain both to individuals, groups and social interactions. With this in mind, we can take as:

- *individual values* those that predominantly pertain to individuals;
- as *collective values* that predominantly pertain to groups.

In regards to the COVID-19 pandemic, the values that will be of most interest here are:

- Collective values: collective safety, collective responsibility, conformism;
- Individual values: individual autonomy, freedom, safety, responsibility, and privacy.

We will use these more commonly used terms further down.

12.2.1 Is There Such Thing as Collective Values (and Collective Entities)?

We have discussed values and their split into two groups of individual and collective. However, the COVID-19 pandemic has shown that it is not clear who should take responsibility for realising these values. This is especially important for crowd management and the use of technology, where the following question arises: is there such a thing as collective agency, intentions and responsibility of crowds; aside, and next to, the agency, intentions and responsibility of individuals?

In other words, our driving question is whether collectives are something different from the simple set of individuals that comprise them, and whether this means that collective values can also, or only, apply to collectives *per se*.

This is a centuries-long ongoing debate between sceptics and proponents, especially regarding collective responsibility (Smiley, 2017). More recently, methodological individualists oppose ascribing responsibility to groups and collectives *per se*, and may only subscribe to a 'collective' responsibility as a distributive

[1] Additionally, values should: "... (1) focus on attaining personal or social outcomes, (2) express openness to change or conservation of the status quo or (3) serve self-interests or transcendence of self-interests in the service of others, and (4) promote growth and self-expansion or protect against anxiety and threat to self" (Schwartz, 2017).

phenomenon, i.e. distinct individual responsibility distributed to each member of a collective. For some sceptics, groups cannot form selfhood and thus lack intentions, wills, agency, and actions. For those with this view, all the above can only be individual and therefore consist only of discreet phenomena.

Nevertheless, proponents of shared intentions (collective intentionality), shared agency, and collective responsibility assert that collectives can indeed have intentions, will(s), agency, and actions, which cannot be explained away as purely individual (distributive) phenomena (Schweikard & Schmid, 2021; Smiley, 2017). Such phenomena might be tradition or shared practices, patriotism, sense of belonging to a group (e.g. one's own family), feelings of societal pride or shame, conformism, organisational identity, life, and activities (such as corporations, states, organisations).

In other words, these are non-distributive phenomena, at least sometimes caused by 'collective intentional agents' (Corlett, 2001, p. 575; in Smiley, 2017). However, proponents of collective values and agency differ on the properties these collective entities have, as well as the criteria that determine whether a set of individuals has indeed integrated enough to take on a collective 'intentionality' of a sort – and thus be a proper 'target' for collective responsibility, accountability, and liability.

Systems theory may come to the rescue here, especially its notions of integration and emergence. The classical approach to defining a system is that a system is a set of things and relations between those things (see Klir, 2013). Without any of the two sets (things and relations), there cannot be a system. Inversely, once a particular set of things 'acquire' a set of relations between themselves, these things have been integrated into a system, and thus the system *emerged*.

Integration into a collective does not necessarily imply that its components (the individuals) lose all independence and personal agency, and thus are rendered into mindless automatons. On the contrary, personal agency and autonomy can remain and motivate individuals to individual action, not always complying with the collective.[2] Additionally, integration in a collective does imply, at least in some cases, a temporal emergence of collective intentions (see Schweikard & Schmid, 2021). Some authors might even consider that, besides obtaining collective intentions, individuals can sometimes integrate with/in collective entities (see, for example, Durkheim in LibreTexts, 2020).

Therefore, we argue that some values, such as responsibility, safety, autonomy, privacy and others, can apply to entities that are integrated in a way that becomes more than just the sum of its parts (individuals), both from the less controversial notion of collective intentions and from the more controversial integration in a collective entity. The individual notions of these values continue to apply to individuals in parallel.

This brings us to our first set of research questions that we want to apply to the case study: how can individual and collective agency be understood in empirical

[2] Just like how one can identify and act as a member of a particular ethnic community, while also identifying and acting as an individual (see Borch, 2009; Johanssen, 2016 and Schweikard & Schmid, 2021).

research? How are individual and collective agency conceptualised in the empirical research study? (see Sect. 12.3.)

12.2.2 The Balance Between Collective and Individual Values, and the Impact of COVID on This Balance

In the ethical and – even more importantly – legal spheres of liberal democratic societies,[3] there can be vigorous attempts to discover the proper balance between individual and collective values. By 'balance' here, we mean a manner of applying values to decision-making, in particular situations, as an attempt to maximise the flourishing of both individuals and collectives (including societies at large) side-by-side, while attempting to minimise trade-offs in achieving this goal.[4] Another way of understanding this is as an attempt to maximise the satisfaction of individual and collective values (for example, the ones listed by Schwarz) in conditions of particular situations and limited resources.

This is an age-old inquiry. The evolution of thought in Europe has been moving from the absolute primacy of the collective (in primordial human tribes) to a slow emancipation of the individual. In Europe, this was bootstrapped by Christianity and its assertion of the divinity of the human being. It resulted in reversing the dominance of the collective, and the primacy of the individual over the collective was born (Hösle, 2004; Maine, 2007; Triandis, 1995).

Legal and moral systems were slow to adopt this change, especially as there was a reactionary pushback towards the reassertion of the importance of the collectives with the rise of the nation-states and dominantly-collectivist thought (anarcho-communism, communism and socialism, fascism, national-socialism, and communitarianism). Finally, the most recent revolutionary development is the creation of the United Nations and its founding documents that pertain to universal human rights and freedoms (Ishay, 2020; Donnelly, 2013).

Most of the developed democracies today are a somewhat balanced mixture between collectivism and individualism. Perhaps this is unsurprising because sociological research shows that human beings are disposed to having (1) genetically inherent types of collectivist and individualist instincts[5] and (2) a culture-gene coevolutionary coupling process (Chiao & Blizinsky, 2010; also see Haidt, 2012).

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[3] We understand such societies as those which regard (1) individuals, (2) the rule of law, and (3) majority voting as vital structuring principles.

[4] Or, in simple words, we may interpret this as treating each individual as equal in inherent value to every other individual, and to every collective—and vice versa. Therefore, if each individual and/or collective is equally important, the values that pertain to them are equally important and should get equal attention. This is, of course, the ideal state of matters that might not actually take place in practice.

[5] Albeit set at differing ratios across peoples and cultures (Way & Lieberman, 2010).

The foundational UN documents (see United Nations, 1945, 1949) affirm the existence of both individuals and collective entities (nations, peoples, families) and affirm both individual and collective rights and freedoms. By doing this, they attempt to validate both individual and collective values, even if they strongly emphasise the rights of the individual by their very nature (Spahn, 2018).

The general way relatively stable European democratic societies have gone about designing their legal systems and institutions has been to develop human rights frameworks that specify individual and collective rights (and therefore assert both types of values), and also to assert the primacy of particular individual or collective values in particular contexts.

For example, governments are generally tasked with promoting the welfare of individuals, collectives and broader society; with special focus on individuals, in order to ensure they are not being dominated by the other two. Nevertheless, in times of emergency (e.g. wars, terrorism, epi/pandemics, vis major and major tragedies), governments often exercise emergency powers that can temporarily suppress individual values, rights, and freedoms, with the purpose of protecting the welfare of collectives and society at large.

There are also some highly specific areas where the government is allowed to assert the primacy of the collective over individuals even before a crisis occurs. This is often done to prevent a crisis. Examples include taxation, mandatory pension contributions, public health participation, law and order services, security regarding critical domains and technologies (nuclear, military, cyberspace, etc.).

In these highly specific mandated cases, there are usually strict boundaries in place to prevent abuse of the state apparatus over individual values, rights, and freedoms. Suppose there is an attempt to circumvent or transgress these boundaries by the government and the state apparatus. In that case, this is a shift towards authoritarianism and a turn away from a healthy democratic process.

Stable democratic societies, therefore, do recognise that both individual and collective values exist, that they are equally important, and that both should receive due attention and affirmation. However, they also realise that particular values of the two types can conflict with each other, especially at times of crisis. When this happens, a discrete balancing solution ought to be discovered through public discourse and decision-making that includes all affected stakeholders. These discrete balance points can favour one or the other types of value in particular contexts.

Finally, the aggregation of all these balancing points, along with the general balancing principles between the two types, comprise the general societal value balance between collective and individual values for each particular society.

As we mentioned in the introduction, the COVID-19 pandemic has resulted in a strong – if temporary – assertion of the primacy of collective values (collective safety, health, conformism, and responsibility) over individual values (individual autonomy, privacy, and responsibility). The assumed rationale is the need to solve the crisis in a predominantly collectivist fashion, which is assumed to be more efficient than in a predominantly individualist or hybrid one. This seems to indicate that support for (quasi-)authoritarian approaches appear to increase in times of perceived threat and crises (Feldman & Stenner, 1997).

Faced with the impending pandemic, governments have taken their leeway to employ measures compliant with this assertion in varying degrees (see, for example, Amer et al., 2021). However, at times and in particular national contexts, this has turned into stringent infection-containment measures that severely disrupted individual rights and freedoms.

For example, China has initially reacted to the spread of the SARS-CoV-2 virus by applying a strict 76-day lockdown and curfew on Wuhan (BBC, 2021). Almost all countries have imposed temporary bans on international travel, internal curfews, mandatory social distancing and hygiene measures, and vaccination status proofs to be able to access specific spaces. Some otherwise democratic countries which explicitly put a strong focus on individual human rights and freedoms, such as the USA (Kimball and Josephs, 2021), Italy, Austria (The Guardian, 2021) and Australia (Al Jazeera, 2021), have imposed almost draconian and potentially discriminatory measures. These include strict curfews lasting many months, mandatory vaccination proofs in order to be able to work in private businesses (or even enter shops and buy food), and lockdowns that apply based on vaccination status.

After initial support for the measures that national governments have implemented to contain virus spread, citizens have started pushing back against these measures through passive and active means.[6] Additionally, the level of adherence to mandated measures or recommendations seems to be also connected to the perceived severity of the risk of infection. This has, for example, been observed among Danish students. The healthier and younger they considered themselves, the less were they concerned with getting infected, and the less they adhered to the measures or recommendations (Berg-Beckhoff et al., 2021).

This pushback, we contend, can be interpreted as re-assertion of the importance of individual values, disapproval of the governmental shift of balance towards collective values, and a demand to restore the balance to a pre-pandemic (or to another more balanced) position.

Due to the recent increase in COVID-19 infections, many governments continue to assert that collective values have a primacy during this crisis and that they have the authority to mandate such measures. One ‘silent’ portion of the population – assumed to be significant – supports governmental measures to prevent the spread of the virus, while another – notably louder – portion of the population vociferously rejects this assertion (see Keiser, 2021).[7]

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[6] *Passive means* include decreasing compliance with the imposed containment measures, such as social distancing, lockdowns and curfews, and avoidance of social contacts outside one’s ‘bubble’, and other (we explore empirical findings in this regard below in Chap. 3, by analysing the findings from the sociophysics paper of Pouw et al., 2020; also, see Beeckman et al., 2020). *Active means* include protests, explicit disrespect towards the imposed measures, refusal to vaccinate and provide vaccination status, disrespecting mandatory quarantine, and other. The strength of pushback against governmental measures seems to be strongly connected to the level of trust and confidence in the government to tackle the pandemic, but also modified by factors such as mental health and wellbeing, worries about future adversities, and social isolation and loneliness (Wright et al., 2020).

[7] This latter group includes individualists, libertarians, minarchists, anarchists, vaccine-, governmental-, and Big Pharma sceptics, members of strict religious groups, etc.

Scholars have shown that this type of polarisation seems to be increasing consistently (Jungkunz, 2021; Keiser 2021). It is related to political (Maoz & Zeynep, 2010) and societal instability (Keiser, 2021), as well as increasing distrust in government, the state apparatus and institutions (Jones, 2015). If it continues for a prolonged period and converts into a chronic societal phenomenon, such distrust might also result in a decreased "willingness to obey laws" (Jones, 2015).

This brings us to our second set of research questions for ethics of technology: what can we learn empirically about the willingness of individuals to obey rules that prioritize the common good in times of crises? Under which conditions are individuals more or less likely to behave in societally desirable ways?

12.2.3 The Use of Crowd Management Technology Pre- and Throughout the Pandemic

The balancing between individual and collective values is not only a question for policy, but also plays a role in the design and usage of technology. Increasingly technologies play a significant role in steering the behaviour of both individuals and groups. As a result, there is a growing potential for technologies to monitor and influence human actions. This has been discussed in the ethics of technology under various labels, most prominently as so-called persuasive or behaviour change technologies (Fogg, 2002; Spahn, 2012).

With increasing digitalisation, technologies can quickly take over the role of nudging people, as developments in ICT allow to monitor the behaviour of individuals or groups of people, collect increasing amounts of data about users and inform, nudge or persuade people to change their behaviour at just the right time (Spahn, 2020). Individual users can download, for instance, e-coaching apps that help them lose weight or COVID tracking apps that inform them about risk encounters. At the same time, digital technologies can be used to monitor and steer the behaviour of large crowds, for instance, attempting to direct traffic flows in cities or crowd management at train stations.

Thaler and Sunstein (2008) have advocated the use of 'nudges' to help people act in line with their values. They propose a framework of so-called 'libertarian paternalism'. Since the environment we live in influences our choices and behaviour, designers of technology can use this to their advantage and push people to behave differently. Thaler and Sunstein argue that these interventions should be in line with the values that people themselves embrace (hence the paternalism part of the label), while at the same time, they should leave people the freedom to override or ignore these nudges (hence the libertarian element of their view).

However, the experience of the pandemic points to a shift in the usage and debate about these nudges. There is a rich literature on the question of whether it is ethical to nudge people since this seems to be interfering with their autonomy and freedom of choice (e.g. Engelen & Nys, 2020; Hausman & Welch, 2010; John et al., 2013),

especially in cases in which individuals might not share the values of the technologies or the designers of these technologies.

Therefore, the question of influencing group behaviour to cultivate social values implies an analogous difference between individual and collective nudges. The original idea defended by Thaler and Sunstein was that individuals could accept nudges in line with their values (such as health, wealth and happiness). Nevertheless, nudges can also be used to influence individuals and crowds towards behaviour or values that are seen to be in line with the greater good, even though the individual might not embrace them. This might be the case in, for example, sustainability (Schubert, 2017), general health care (Capasso & Umbrello, 2021), or in adherence to COVID-19 rules.

This brings us to our final set of research questions for ethics of technology: how can we use technologies to influence individual behaviour? How willing are people to accept nudges that prioritise collective values?

12.3 Crowd Control – a Case Study from Sociophysics

We now move to focus on one particular crowd control technology, developed and used by the SRCrowd project of the Physics of Social Systems group at the TU/e (Eindhoven University of Technology), and described in a recent sociophysics paper by Pouw et al. (2020). This technology was and is used to analyse crowd behaviour at the Utrecht train station, the Netherlands, before and during the COVID-19 pandemic.

We use our exposition of the three relevant domains of philosophical research questions to structure our explorative analysis of the case study, and to identify important steps for future research.

12.3.1 Individual and Collective Agency

To conduct their studies, the researchers had to find ways to empirically identify different types of collectives and the relations between collective behaviour and individual agency. The researchers have managed to determine a variety of crowd phenomena and properties, such as *family group relationships*, *offenders*, *repeated offenders*, *crowd density*, (potential COVID-19) *exposure time*, *relevant interactions*, *family-groups subtransitive closure*, *total individual exposure time*, *pairwise exposure time* and *distance*, and *evolution of behaviour* before and throughout the COVID-19 pandemic.

It is worth noting that all these phenomena and properties (except evolution of behaviour) can be tracked and determined in real-time. For example, this means that crowd behaviour can be tracked and analysed by using live feed from trackers around train stations or later applied to such data that was pre-gathered.

For the relation between individual agency and collectives, the identification of group relation is an interesting way to identify family-group relation based on observational data. The criteria set for the predetermined amount and distance for two or more people to be considered a family group are people who have a pairwise distance of fewer than 1.5 m for 90% per cent of the time and are within 1 m for 40% per cent of the time (Pouw et al., 2020). The rationale is that "pedestrians who followed the same trajectory, thereby being in mutual proximity for the major part of their persistence time, and who are comfortable for extended periods in each other's private space ($r \leq 1$ m) most likely belong to the same family-group" (Pouw et al., 2020, p. 8).

The research also attempts to define and identify **unwanted collective behaviour**.

The primary measure used for this purpose is the so-called '*Corona event*', where "two people, not belonging to the same family, get closer than a threshold distance D" (Pouw et al., 2020, p. 2). The distance is defined as equal to or less than 2.5 m. This criterion is modified further in the paper by using a particular minimum contact time of 0 s, 5 s, and 30 seconds (Pouw et al., 2020). Travellers that act irresponsibly and don't respect these conditions (i.e. by triggering a Corona event) are labelled *offenders*, and travellers that repeatedly disrespect the conditions are labelled *repeated offenders*.

Combining the operationalisation of collective units, such as e.g. families, and unwanted behaviour, such as a corona event, allowed the researchers to successfully discern family groups and offenders of social distancing measures. For example, Fig. 12.1 above describes the acceptable behaviour of a 'family group (a) and an unacceptable behaviour of a (repeated) offender (b). This shows that sociophysics research can aid sociological, psychological and ethical research, if the limitations of such data-driven analysis are taken in consideration.

12.3.2 Adherence to Rules and the Balance Between Individual and Collective Values

Through tracking and analysing crowd behaviour on the Utrecht platform, especially regarding the so-called Corona events (which we previously took as a proxy for unwanted collective behaviour), the sociophysics research by Pouw et al. (2020) can provide valuable ethical insight into crowd behaviour, and (collective) responsibility.

When trying to manage crowds to adhere to ethical rules, such as the corona measures, it is essential to bear the phenomenon of *rule fatigue* in mind. Regarding the adherence to corona measures, it was found that travellers suffer from what can be defined as 'rule fatigue' i.e. the steadily decreasing adherence to suggested or mandated behaviour-regulating rules over time. Furthermore, the researchers found that as the use of the platform slowly recovered from the initial dip at the beginning of the pandemic (i.e. from weeks 17 to 26), so the average individual exposure time for distances between 0.5 m and 2.5 m increased (i.e. offences and (repeated) offenders statistically increased), thus increasing the risk of infection (Pouw et al., 2020).

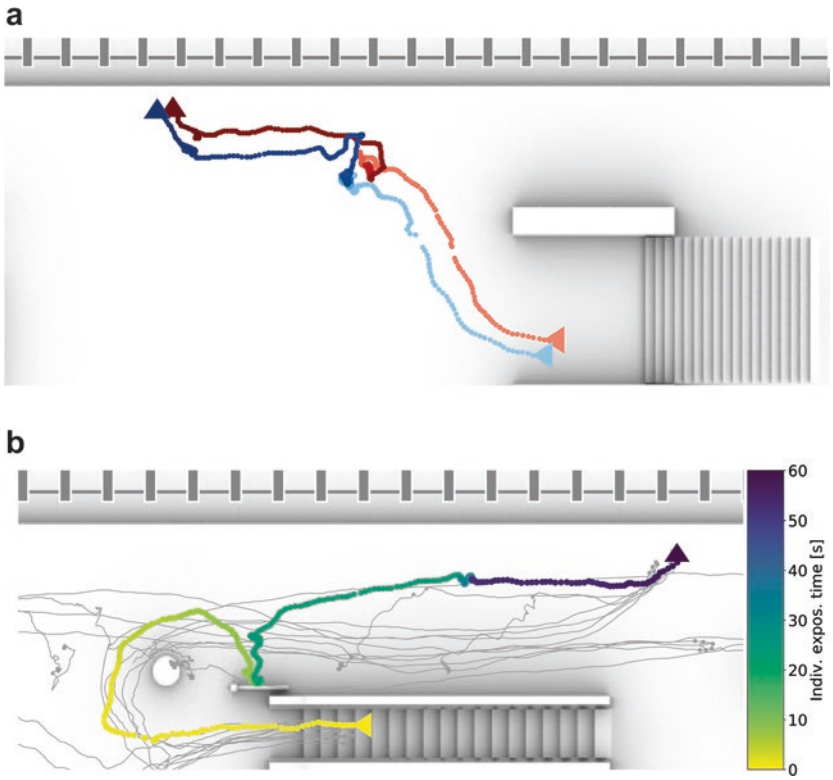

Fig. 12.1 (**a**) Detected clique consisting of two nodes representing two people travelling together. Both entering the platform through the stairs, waiting together for the next train to arrive and finally boarding the train through the same door. The hue of the trajectories is proportional to the time spent on the platform. Lighter hue when the people enter and a darker hue when they leave. Jump in hue, indicating the place where the travellers were waiting. (**b**) Detected node with degree higher than 10, i.e. a repeated offender who violates physical distancing with more than 10 other people

This trend was only temporarily 'reset' when the train schedule was changed on June first, after which the number of repeat offenders started steadily increasing again (see Fig. 12.2. above). On the 1st of June 2020, the train schedule was restored to pre-pandemic levels, which suddenly increased the respect for physical distancing requirements. This change has taken place possibly because the train schedule change has 'shaken out' people out of their habituated abiding of social distancing rules (i.e. behavioural inertia, see below); because it made respecting these rules easier by reducing the load on the platforms; or a combination of these and other factors in play. Similarly, rule fatigue seems to be involved again, since the respect for the social distancing measures again steadily decreases from this date onward. Part of rule fatigue appears to be people developing behavioural inertia as they get used to measures, resulting in adherence in an 'automated' fashion without paying much conscious attention, which might be why compliance decreases over time.

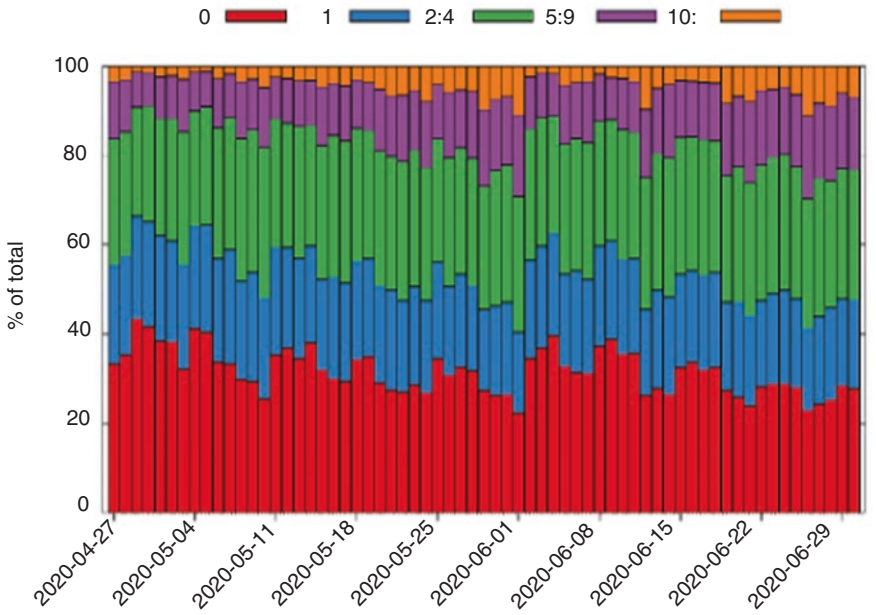

Fig. 12.2 Rule fatigue. Distribution of node-pedestrian degree per day as a percentage of the total number of passengers. The degree of a node counts the number of people encountered with a mutual distance smaller than 1.5 m (hence, degree 0 means that a person did not have any Corona event). Pouw et al. (2020, p. 10) observed that high-degree nodes, i.e. repeated distance offenders, increased steadily until the train schedule changed. The schedule change on June 1st yielded a temporary drop in the offender percentage, after which it started increasing again

Rule fatigue can be considered an ethically relevant phenomenon that can be considered when designing and employing crowd management rules to ensure the best possible effect from enacted rules while not irritating people that are supposed to be following them.

Additionally, in parallel, the average individual exposure time for distances below 0.5 m. remained the same, which might be interpreted as individuals being adamant about keeping their personal distance from strangers.

12.3.3 Acceptance and Acceptability of Social Rules

Another phenomenon that was discovered in the paper, and which is relevant to the ethical question under which circumstances are people willing to follow the social distancing rules, was that travellers find keeping enough distance with unrelated other passengers manageable until the density threshold of 1 pedestrian per 5 m^2 is reached (with minimum contact time threshold of 30 s). After this threshold is passed, the number of Corona events sharply increases.

This result is not only a physical boundary condition, as this density implies that people are on average 2.2 m ($\sqrt{5}$ m^2) from each other. As the authors themselves point out, this "... can suggest an increase in difficulty in following distancing rules around this density level" (Pouw et al., 2020, p. 10). Ethically interpreted findings such as this one can positively inform policymaking in designing better and more ethically acceptable rules for crowd control and social distancing.

A third interesting observation that can help ethically acceptable (e.g. privacy-preserving) crowd tracking while informing policymaking is extracting the statistical average of family groups from the total number of travellers. For example, Pouw et al., by using the criterion of people having a pairwise distance of less than 1.5 m. for 90% of the time and less than 1 m for at least 40% of the time, have managed to identify (the percentage of) family-groups which are allowed to stay close together without infringing upon social distancing rules. On average, around 11% of all visitors of the platform belonged to family groups. Interestingly, this average did not change throughout the analysis even though the number of visitors, density, and offenders did.

Aside from the identified phenomena above on which we put some focus, a closer collaboration might result in a better understanding of a plethora of other crowd phenomena relevant to ethics.

Some examples would be *pairwise exposure time* and *pairwise distance statistics*, *total individual exposure time* (which might help in determining the risk a particular individual has to become infected); *family subgraph transitive closure* (for identifying people that consider themselves mutually close or intimate); *pedestrian density* and *average pairwise distance* as proxies for what people consider their personal space; and others.

Future research should complement these empirical findings with qualitative insights about the experiences of travellers and their motives for adhering or breaking of social rules, such as the distance keeping. This should give insight into the psychological acceptance of (a) monitoring of behaviour with regard to privacy, (b) of social rules and norms for desired behaviour and (c) nudges to adhere to desired behaviour. These findings can inform the ethical debate on the moral acceptability of crowd nudges and the right balancing point of individual and collective values in a post-COVID-19 world.

12.4 Conclusion – The Future of Crowd-Management and the Relations Between Individual and Collective Values in a Post-COVID-19 World

We initially stressed the importance of balancing individual and collective values and how an emergency such as the COVID-19 pandemic can potentially shift this balance. Then, we focused on a crowd management research case that was held at the Utrecht train station and found several examples on how social physics and ethics research can mutually support each other.

Finally, we want to discuss three important lessons learned from the COVID-19 crisis: (1) the importance of the empirical evidence for the individual-collective debate, (2) the ethics of individual and collective nudging, and (3) the relevance for the core philosophical debate on individual-collective responsibility and agency.

The social physics case study tries to monitor and understand individual and crowd behaviours. We showed that ethical values such as responsibility, autonomy, privacy, and others, are in the models and the research. The sociophysics researchers use these values and their individual or collective characteristics implicitly in their models.

In future work, we will conduct interdisciplinary research on crowd management at train stations from sociophysics, psychology, and ethics of technology. Further support of sociophysics might help ethical research to get more empirical evidence about the relation between individual and collective behaviour to the ethics debate. As such, ethics research will be able to use the empirical information to formulate new insights on ethics in crowds. This will be particularly relevant in cases of COVID-19 regulations.

This brings us to the second lesson we believe can be drawn from the ethics of nudging of individuals and crowds. Now it may already seem clear that nudging all individuals to exert the same healthy behaviour is different from nudging some people to do different things, such as going left while others go right to disperse crowds. Therefore, some common and important issues pertaining to nudging are: (1) What exactly it means to 'nudge a crowd'? (2) How can the ethical rules governing individuals and crowds be separated?; (3) How can we nudge crowds from both an ethical and psychological point of view, while respecting values such as autonomy and privacy; (4) how can crowd properties (e.g. density, spread, flow) modify individual behaviour, for example, relevant to respecting COVID-19 rules.

Of course, the above discussions of the empirics and the ethics of nudging collectives bumps into the fundamental philosophical questions of individual-collective agency/responsibility, and whether collective agency, responsibility, deliberation, and values in general, exist or not. This is also relevant for obtaining an overall view of what (a) society is, which is particularly important if we zoom in on the application of COVID-19 measures.

Although this chapter is only exploratory, we postulate that further research in this direction might add to this fundamental debate. Further empirics and understanding of the interactions of crowds in a particular train-station situation might provide information on the fundamental interactions between individuals and collectives in society. It would help develop further guidelines for democratic decisions in crisis moments such as during the COVID-19 pandemic. This information will help specify how concrete measures should focus on individuals and collectives, and how to increase the effectiveness and the propriety of these measures.

Ultimately, our exploratory analysis above intends to emphasise the golden question for the post-COVID-19 debate, namely, *what is the right way to balance individual and collective values in the future*. This is, fundamentally, an ethico-philosophical debate, but which has wide-ranging effects on many other societal domains, such as health, economy, technology, and more.

In all, considering the above example advancements in crowd management techniques and tools, we argue that having a multidisciplinary and data-driven approach during ethico-philosophical argumentation and analysis can significantly enhance them. And since ethics and philosophy can be improved with the help of other data-driven and real-life studies, ethicists and philosophers can thus produce better argumentations regarding various public health and security policies during their design, enactment and implementation. Therefore, we argue that policymakers ought to engage more with ethicists and philosophers during the design of these policies, especially those that utilise multidisciplinary approaches.

Finally, taking all the above into account, we argue that there should be a widespread public debate on the balance between individual and collective values, general balancing principles in this regard, the assertion of primacy (conflict resolution) during and outside times of crises, the boundaries of governmental action in mandating measures, the acceptable use of technology, and the policy created thus.

This debate must include all relevant stakeholders (government, scientific institutions, the public, identified groups at an increased risk, medical practitioners, philosophers, ethicists, sociologists, psychologists, and others). It must result in policy deemed acceptable by all of the above to provide authority to policymakers and avoid the tension, polarisation, and perceived rise of (latent) authoritarianism recently observed among and by citizens in democratic societies.

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