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# Post-industrial Virtue Epistemology on Globalized Games and Robotics

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<http://dx.doi.org/10.5772/intechopen.68624>

## Abstract

With the development of personalized and globalized technologies, a discussion regarding how and why virtue epistemology should be an essential part of post-industrial ethical analysis on augmented technologies and use of robotics in the global age becomes crucial. These globalized technologies in the form of either game apps (i.e., *Pokémon Go*) or robotics like drones become through the Internet multimedia a structural part of planetary digitalization. While this development takes place, traditional virtue epistemology responds insufficiently to the devitalization of knowledge regarding manners (*savoir vivre*) and ways (*savoir faire*) of practicing and the need to respond to the sudden expansion of augmented games and drone use with personal and social intellect, responsibility, and consequently safety. The chapter intends to discuss this analysis in order to argue that a postindustrial epistemic reconfiguration of digital ethics is necessary, since augmented reality games and robotics are taking the form of massive trends for adults and nonadults, while for the first time, digital gaming and robot entertainment exceed the limits of the personal space and the virtual mode of the screen, moving out into the public realm, where reality is mixed with virtuality and human environment with unmanned robots.

**Keywords:** postindustrial, virtue epistemology, augmented reality, drones, globalized games

## 1. Introduction

Augmented reality (AR) digital games like *Pokémon Go* and robotic entertainment like drones redefine the ethical character of gaming in a public scale, since they become instantly popular and globalized by the IoT. In this sense and in terms of technology and entertainment,

being global means being digital [1], since this “game globalization” develops independently from the politics of globality, and consequently one can estimate that these practices will be enhanced, developing the future of digital entertainment. Hence, the question that the chapter wishes to answer is whether it is possible to apply a virtue epistemology in the global expansion of digital games and robotic entertainment, in order to redefine the knowledge conditions of *savoir vivre* and *savoir faire* in terms of their use that will be practically depicted in the minimization of their personal and social side effects.

## 2. Expansion of augmented technologies and the epistemic gap between VR and empirical conduct

*Pokémon Go* [45] and relevant augmented technologies like *Ingress* [45] or *Zombies Run* [46] bring for the first time an active intersection between virtuality and the real world, by practicing a virtual order in an empirical scale. As “Augmented,” we define the technological reality where “virtual content is overlaid into a user’s perspective of the world” [2]. During the summer of 2016, *Pokémon Go* gained a massive popularity in a world scale that showed everyone what does the term “globalized game” means. This sense of globalization reached a new level of authenticity that was different from the first arcade globalized video games like *Pac-Man* [47] and *Space-Invaders* [48]. Whereas the latter have been developed gradually from one country to the other within a decade, *Pokémon Go* has reached a level of global acceptance only within a month. This rapid expansion of augmented games is to a large extent the result of the progression of IoT and the digital transformation of video game industry’s way of thinking from local to global.

The credits for a free-to-play game whose purpose is to locate and capture virtual creatures along with the fact that *Pokémon Go* “has been suggested to improve public health by promoting physical activity” [3] made it instantly popular. The “health benefit” idea that many augmented mobile technologies offer is a decisive factor that differentiates their form of virtuality from traditional virtual reality (VR) game, which is static, leading to body inactivity: “now that many adults have a powerful and Internet-connected device always within reach in their pocket or handbag, the smartphone has become the ideal platform for short, sporadic, and flexible moments of video play” [4]. This shift from virtual passivity to virtual activity plays a central role in enhancing the user but at the same time brings for the first time in human history a practical and daily convergence and intersection between virtual and real environment. The *Pokémon Go* player chases virtual creatures in a real environment while at the same time other (nonvirtual) practices take place. The practice of the game, when it goes public, creates factual dangers not only for the player of the game but also for others, becoming thus a functional problem of ethical conduct (*savoir vivre*: knowledge of manners and *savoir-faire*: knowledge of ways).

Hence, the main advantage of augmented reality games can be transformed, because of a lack of ethical conduct into their main disadvantage. By ethical conduct, one defines a set of rules, in the form of an ethical code, that will promote the values of the game (i.e., virtual values of the game), with respect to the already existing values (i.e., physical and social reality

values). In this section, I intend to show by using both actual and theoretical cases the side effects of the aforementioned intercrossing between virtuality and reality that outdoor use of augmented games may cause [5]. With 15,000,000 players behaving virtually in a real environment worldwide, the number of car accidents in the USA reached 113,993 incidents in the first 10 days of its use, which were caused either by drivers' or by pedestrians' distraction [6]. Virtual distraction provided the chance for many robberies to succeed since the players/victims have been vulnerable to physical attacks. Furthermore, an increase has been noticed in trespassing on railway lines and in the road [6]. In addition to these, a recent research showed that "More than a quarter of players reported being likely or very likely to play the game while driving (27%), biking (43%), walking (without paying attention; 32%), and sacrificing sleep to play greater amounts of the game (38%)" [7].

Theoretically, the catalog of safety problems can be continued with the addition of all the possible incidents of disarrangements in daily life activities from walking to shopping disturbances and from riding a bike to drinking a coffee, but what is more important is that virtual distraction from the dangers of physical reality might lead even to potential kidnapping [8]. Even though the diversity of dangers can be endless from a quantitative point of view, in terms of their quality one can conclude that their character can be physical, legal, psychological, and cognitive and that "mobile and mobile-augmented reality applications can promote distraction" [9], since Pokémon Go "is the first mass market app that fully transcends the virtual, the spatial, the social, and the physical" [10].

The epistemological inquiry underlines that in these activities a person behaves in an empirical environment, with real dangers and contingencies, in a virtual manner, establishing thus (a) an epistemological discontinuity (from physical to virtual) and (b) as a consequence of (a), an ethical disorientation [11]. According to Deleuze's analysis of the relation between the virtual and the actual, these two modes of being create "a form of circuit" [12], where "the actual is the complement or the product, the object of actualization, which has nothing but the virtual as its subject" [12]. Hence, from an ontological perspective the virtual appears as a modal reality of the actual, but by describing the problems of virtual distraction in a physical environment one refers to two different understandings of actuality.

In the player's hybrid actuality, the physical environment is a fact that is contiguous to the fact of the quest of a virtual creature, while for the non-players physical environment is a fact that is contiguous in their personal activities in a public space. However, there is a crucial difference among the players and the non-players which is that for the non-players there is nothing apart from themselves to distract them, whereas for the player there is a virtual component that (a) distraction is part of the game since they chase a virtual creature, (b) that this virtual creature is something other than themselves, and (c) that the responding activity of the software during the game is totally unconnected from the other facts of the physical environment.

Thus, even if both groups perform something practical, the group of players develops a behavior that after a certain point disconnects it from the environment it belongs both physically and socially since "they expand the game outside the traditional game space (the board or the screen) by merging physical and digital spaces" [13]. This is what causes an epistemological discontinuity from physical to virtual, not because the game is not actual but because in order for the game

to proceed, a part of it (Pokémon's "behavior") remains unpredictable and thus totally disconnected from the physical environment of the public space. On that account, for the first time in human history we are dealing with a software game that energetically drives the player's attention away from its physical and public environment, without any recognition of the changes or the possible dangers of the latter. This lack of detection can be verified not only in extreme cases like an earthquake, where the Pokémon will hide in the debris, but it becomes even more obvious through the daily frustration that it applies in human interaction leading often to accidents, serious or minors, and it is at this point where the epistemological discontinuity transforms into ethical disorientation, that is, a social mismanagement of the ethics of public sphere.

Ethical disorientation through augmented video games is not the product of a different understanding of ethics, nor is it part of an "augmenting situationist movement" revival through a downloadable alternative as some have discussed about AR games. What develops intrinsically between the game's players and the non-players is a virtue conflict. A virtue collision is between playing the game sufficiently in order to win using virtual manners in public on the one hand and be absorbed by daily life routine public ethics of *savoir vivre* and *savoir faire* on the other. What appears theoretically as an epistemological discontinuity continues practically as ethical disorientation in human interaction but ends up as a conflict between different virtue motives: "With *Pokémon Go*, locative game use behavior becomes a public event, a matter for public regulation. It becomes so recognizable as a reason to congregate in urban public places that it may become a resource for political demonstrations. In short, while most of the game-related mobility observable with *Pokémon Go* has already been observed before, the sheer commercial scale of the game turns such mobile behavior into a new kind of issue" [14]. Consequently, the most crucial aspect one examines in relation with global AR video games opens up as a problematization of virtue epistemology.

This becomes unavoidable after a certain point since the rapid expansion of technological evolution causes a virtual rearrangement of physical life as we knew it. Biomechanical structures, which are extensions of physical movements through mechanics, are substituted by intermediational processes, which are representational replications of reality through screens, where the virtual and the physical, that is, the digital and the analog, functionally intercross one another leading among other things to conversions of virtue motives that likewise ethically intercross between virtual and physical. Augmented reality video games are the first technologies that manage to globalize this intersection between physical and virtual since "AR enjoys clear advantages in comparison to the traditional VR. One of the key advantages gained by AR is having a better sense and interaction of reality whereas it lays emphasis on the organic integration of virtual environment and the real world" [15].

This means that in order to further explore these technological and ethical rearrangements, virtue ethics and virtue epistemology have to update their analytical character and involve further into subjects that deal with hypermodern virtue crossing between physical ethics and its already-established *savoir vivre* and *savoir faire*, and virtual or augmented games ethics—"games that elicit physical activity have been called Active Video Games (AVG)" [16]—as well as with their apparent weakness to connect their virtue motives to physical environment.



The very fact that pushes someone to distinguish between physical and virtual ethics is a consequence of epistemological inadequacy to formulate forms of “augmented” ethics that would sufficiently correspond in a problematization upon a technology that “bridges the gap between the real and the virtual in a seamless way” [17]. It is important in order to proceed epistemologically to understand the nature of this epistemic gap, between physical and virtual or augmented reality. I will use as a basis of analysis a classical—in terms of ontological significance—and still current distinction between physical and social reality by John Searle. According to Searle, there is physical reality whose facts are measured by mathematical, physical, chemical, and biological factors, and there is social reality that even if arbitrary—and by arbitrary Searle means constructed—it is constituted by social inventions that become factual through collective intentionality which represents for Searle “a biologically primitive phenomenon that cannot be reduced to or eliminated in favor of something else” [18] like individual intention. Collective intentionality is based on social consent and the latter includes both ethical and virtue standards in relation to functional and consequently technological uses.

In other words, all forms of technology emerge in our daily life with the objective of becoming functional and massively useful directly or indirectly. However, their functional character presumes a transformation or an adjustment of our collective intentionality by approving and expanding their use practically. According to many, it “is laudable that Pokémon Go encourages players to become more active in walking and running whilst playing the game, which undeniably will contribute to the need for regular cardiovascular exercise in the fight against obesity. It also promotes exploring local areas and points of interest, which should be encouraged” [19]. This practical use either promotes new forms of ethics and virtues that correspond to the already existed, creating thus social consent, or collides with the established ethics and daily behavioral virtues, that is, *savoir vivre* and *savoir faire*, causing a turn of collective intentionality away from it. Some examples of innovative technologies that failed to be bridged with the ethical standards of their time are Google glasses, nuclear weapons, e-books, virtual reality, or driverless cars. All these technologies have failed to be massively accepted for several reasons and incompatibilities that were cognitive, practical, or even psychological, but in every case, they failed to create an ethological bridge with previous practices and forms of understanding.

Hence, the epistemic gap is the consequence produced by any cognitive act that becomes technologically operative, and while it transforms our empirical and perceptual aptitude, it manifests itself by its difficulty to bridge technological operation to the ethology of the present in order to become functional. Technological inventions are artifacts by materials and scientific applications of physical reality which expand the latter, but in order to be functional they have to be absorbed practically by collective intentionality. Augmented reality video games are no exception from this ground, but by evolving in an interactive, public, and most importantly global manner, which at the same time diffuses augmented reality into fields such as education, professional training, and research activities, it is meaningful to seek through a hypermodern virtue epistemology for those elements that will couple physical and virtual components of an augmented ethos.

### 3. Drone robotics, uncontrolled aviation, and virtue ethics

Drone robotics is an example of microtechnology machines that also for the first time transforms social and ethical perception of airspace environment. Similarly with the case of AR video games, drone practicing especially through private ownership might have side effects that can end up highly problematic in terms of privacy violations both in public and in a domestic environment through airspace. The drone fear regarding their private use affects the relation between civil airspace and ethics of everyday life to the extent that (a) civil airspace has not been occupied before by unmanned robots and (b) human ethics are based on biological factors of communication, perception, behaviors, and reactions that exclude aerial concentration.

The historical and practical codification of human terrestrially based ethical standards is expressed through the use of a corresponding *savoir vivre* and *savoir faire*, that is, knowledge of the codes of behavioral and communicational virtues that create a hierarchical but practical state, while avoiding chaos and social misconceptions in everyday life. Both knowledge of *vivre* (living in the existential sense) and knowledge of *faire* (social skills) are not simply codes of polite manners and aesthetic formations, which is their usual, however, superficial account, but they are active statements of order and functionality that use as their basis capacities of virtue. My argument will attempt to demonstrate that their virtue capacity is not only useful but also significant in a world that rapidly changes, and where social complexities multiply as new forms of activities and thus ethical frictions constantly emerge. This argument becomes evident when applied in the use of new technologies that is under private ownership and used in public, like micro-robotics and specifically drone robotics.

Through the IoT, we experience an interface between physical and data reality where “drones represent a part of these “things” that collect, store and process large quantities of data that are then here to be acted upon” [20]. DIYers and hobbyists become increasingly fascinated with drones that become more and more affordable for personal use globally: “A generation is growing up with robotics as a part of its engineering DNA. It is only a matter of time before that generation shocks us with what it can do—and how cheaply” [21]. Notwithstanding, according to a recent US public poll “forty-two percent went as far as to oppose private ownership of drones, suggesting they prefer restricting them to officials or experts trained in safe operation” [22]. In addition to that “64 percent said they would not want their neighbor to have a drone” [22]. The reasons behind these hesitations are fear of snooping, violation of privacy, and anxiety regarding monitoring. Since private drone use is legal, and since it is impossible to recognize and distinguish whether a flying drone belongs to a company or to a citizen, a new era concerning the above ethical fears has begun.

It is inescapable thus that drone users, both private and companies, will blend into civil airspace, with entertainment and commercial motives, respectively, and that without a previous code of ethical management, drone using will definitely confirm the ethical uneasiness of the public. First and foremost, drone offers to the user the power of invisible presence, that is, the ability to record and collect parts of physical reality from distance without being seen but through a “subjectless machine” [23]. Thereupon, if we consider that there is a behavioral problem in a person that stumbles on others or in objects, while messaging in a mobile

phone, and if we conclude that there is something alarming when a person endangers his/her existence while chasing a nonexistent virtual creature, then to expect violations of privacy by drone civil use is a concomitant event since “drones are able to fly autonomously in different altitudes and they are usually equipped with sensors to monitor the environment and communication units to exchange data with other drones or central stations” [24]. The common element in those three cases is that they all appear as massive technological trends that pervade anthropologically in daily culture.

It is obviously the beginning of a post-industrial and global form of entertainment that differs a lot from the globalization of games such as skateboarding, rollers, or anything else that operates as an analog mechanism within the perceptual and restrictive limits of physical reality. Whereas in the case of AR games, one can object that during the game the fault about whatever may happen is strictly perceptual, hence the technology itself is secure, when it comes to drones, a recent research—which is the world’s first with regard to accidents with drones—shows that there are technological defects that lead to operational misadventures: “Recently published in the journal *Aerospace*, the study found that in most cases, broken communications links between the pilot and the RPAS were the cause of the incident, leading the researchers to call for the introduction of commercial aircraft-type regulations to govern the communications systems” [25]. The study opens the question of responsibility in case of an accident regarding “Who (or what) is responsible? The drone itself? The designer of the drone? The officer who gave the order to deploy it? The commander in chief? Similar questions spring to mind in almost every application of autonomous robots we care to think of” [26].

While the study reveals that drone industry has to promote even more sufficient ways for solving safety and operational problems, the law regulation for drone use differs from one country to the other, whereas in many countries the regulations are inexplicit and in some others they do not even exist. Technology and experimentation are historically synonymous, and the myth of Daedalus and Icarus is an ancient narrative that appears as an account of a pioneering technology that ends up in a tragedy. The account suggests that independently of the operational deficiencies in any technology, it is always the human factor that supervises and ensures its safe use. In the case of drones, apart from the legal incongruity and the operational problems one should also consider their further booming through the convergence between their price decline and the growing fascination for a fast-developing technology that corresponds in a very wide category of usages beyond entertainment, from photography and mapping, to survey and cargo systems.

The lack of a general and common post-industrial legislation shows for once more that theory comes after practice and thus always behind time, but the most important thing displayed is again the lack of a universal attitude that exposes the epistemic gap between human terrestrial biology and the occupation of civil airspace by drones. Since human terrestriality is common and since civil airspace relates to it under the same biological limitations globally, then the legislation for drones ought and should be generalized and become a post-industrial ethotechnological matter-of-course, that is, a *savoir vivre* and a *savoir faire* for robotics. But in order for this to happen, a virtue epistemology should prepare the basis for the virtues upon which legislation will further develop into laws since virtue “is a synthesis in which the law loses its universality and the subject its particularity” [27].



In other words, virtue is to be understood in the modern world as the “synthesis of personal character and the objective norms” [28]. Because when a legislation does not come under a set of virtues that connect intrinsically virtue and technology, then it progresses as prohibition or conformity that demands obedience or deference to a set of normative rules that as “technical” as they may be by setting different measures of distance from domestic areas from drones violations; they will never be able to reach neither the speed nor the magnetism that new entertainment technologies achieve either by mixing different modes of reality (respatialization through AR) or by actualizing enterprises that humans are biologically unequipped to produce by their own means (respatialization through unmanned aerial vehicle (UAV)).

Consequently, it follows that the virtues one seeks to promote for a post-industrial ethos should be able to connect the epistemic gap between historicity and functionality of virtues. In other words, one has to employ classical elements of virtuosity (citizen virtues imposed by society), and adjust them to modern or civic virtues (individual virtues exposed by the self), towards the practical needs of hypermodern freedom, where individuals create environments by the technical means of their time, like VR and AR, and understand their freedom by and through these technical objects (virtues of civic individuality disclosed in a digitally respatialized environment: technoviduality). The latter explains the anthropological and cultural gap between an era where freedom was solely an event of dialogue and face-to-face communication from the current annexation of face-to-screen discursive reception and transmission.

Technovidual becomes a receiver of otherness and a presenter of itself through different media embodiments and the progressive globalization of IoT. Within post-industrial ethics, individuals acquire the opportunity (especially the younger generations) of receiving the social realm neither through imposition nor solely by physical communication but through different interconnected devices. This is why it is essential for the individual to understand these personalized mediums as foundational part of its current conditions of freedom. Machine becomes the new fellow being because the human fellow being is present as a respatialized extension of the machine, not only technically, as it was the case since the industrial revolution, but post-industrially as a person. But even in their political struggles for freedom, for example, the Arabic spring, people consider for the first time unarmed mobile machines to be their informational “comrades.”

From an epistemological point of view, humanity is passing from a transformative stage of its technical and thus environmental and communicational status into a new one where human presence becomes an issue of respatialization through technicity, but to the extent that this is a fact, then it follows that virtues, as part of presence, become also an object of respatialization processes. On that account, one may begin to acknowledge some basic public virtues as elements that civic technological use either in the case of AR or in the case of robotics can and should attempt to engage. A possible employment of a virtue like technological *phronēsis* (prudence), composed by supplementary character traits like technical *euboulia* (deliberation) or *sunesis* (sagacity), and intellectual skills like technical *deinotes* (cleverness) and technical *gnomē* (judgment), would be beneficial not only in terms of a dialogue between virtue epistemology and technological ethics but most importantly in the understanding of practicing these technologies with social responsibility and eagerness. In other words, a postindustrial virtue analogy would connect existence (*vivre*) and sociality (*faire*) with the global development of digital culture and digital anthropology.

## 4. Promoting virtue through epistemological analysis

To the extent that ethical problems become practical as I have shown in Sections 1 and 2, and based on the fact that augmented technologies and robotic engineering as globalized trends in entertainment will inevitably continue to develop, virtue epistemology has to address the problematic character of the discussed practices by focusing between the cognitive capabilities of the augmented gamer or the drone user (reliabilist approach) and their corresponding intellectual traits (responsibilist approach). In this section, I develop an argument that will incorporate elements both of the reliabilist and of the responsibilist approach in order to show that both of them are equally important and interdependent for the development of a post-industrial virtue approach toward the public use of AR and robotic technologies.

The distinction separating the reliabilist and the responsibilist approach consists in two different classes of cognitive and intellectual traits correspondingly that provide a person with the ability to qualify intellectually and/or as a character: “‘Virtue responsibilists’ conceive of intellectual virtues as the intellectual counterpart of moral virtues. These include traits like fairmindedness, open-mindedness, intellectual carefulness, intellectual courage and the like. ‘Virtue reliabilists’ conceive of intellectual virtues as any reliable or truth-conducive quality of a person. They cite as paradigm cases of intellectual virtue certain cognitive faculties or abilities like vision, memory, introspection and reason” [29]. I further argue by using four Aristotelian “secondary” virtues like *euboulia* (deliberation), *sunesis* (sagacity), *deinotia* (cleverness), and *gnomê* (judgment) that it is possible to formulate a postindustrial *phronêsis* whose target would be to

- a. bridge the epistemic gap between spatialized and respatialized realities in terms of social responsibility and public rights (e.g., physical and virtual in the case of AR, or terrestrial and aerial in the case of drones);
- b. provide the ground for a psychologically safe and easy-going approach of practicing technological entertainment;
- c. ensure responsibility without minimizing the skill competition and the enthusiasm for these technologies; and
- d. refresh and regenerate the importance of *savoir vivre* and *faire* in the digital era as a guarantee of technical intellect based on virtue (both moral and cognitive).

Since we deal with problems that are first and foremost practical and it is through their social practicability that they become ethical, and since the reasons of our inquiry deal with public and consequently civic virtues, the aim of the chapter is not to isolate the knowledge of the good from practicing the good, which corresponds to the Aristotelian notion that “the science of the human good is politics” [30] and in particular social policy regarding public games and robotics. However, a postindustrial social policy of this kind should not be framed upon a plan that connects policy with the exercise of a corresponding law wherever the latter exists or whatever it may concern, but with the exercise of policy based on virtues. The main problem with law or legal pressure for safety reasons regarding personalized technologies and micro-/nanorobotics like AR games and drones is that their mobility along with their

increasing effectiveness regarding respatialization makes legal intervention a complicated and insufficient tool, from both a regulative and an operational point of view, which as experience from other cases shows, when it cannot intervene drastically, it becomes more disciplinarian and prohibitive.

According to Bent Flyvbjerg, it is possible to connect virtues such as *phronēsis* to contemporary social policies, since “Aristotle saw not only as the necessary basis for social and political inquiry, but as the most important of the intellectual virtues. *Phronēsis* is most important because it is that activity by which instrumental rationality is balanced by value-rationality, and because such balancing is crucial to the sustained happiness of the citizens in any society” [31]. *Phronēsis* in a post-industrial context is the virtue that is able to intellectually connect the epistemic gap caused by technological inventions to the problems caused by the users of these technologies, that is, between *episteme* and *techne*. In particular, by using four supplementary virtues, like *euboulia* (deliberation), *sunesis* (sagacity), *deinotia* (cleverness), and *gnomē* (judgment), I will explain why they can sufficiently correlate with the four targeted propositions of a postindustrial virtue epistemology. The first two of these intellectual virtues can be described as assimilative in their characteristics, whereas the other two as enterprising. By assimilative, I mean that character-trait virtues like deliberation and sagacity have absorptive capacities that contribute in the closing of the gap between *episteme* and *techne*, whereas by enterprising, intellectual virtues like cleverness and judgment innovate these new fields to move beyond the gap by organizing the ways through which these practices will remain exciting while prudent and sensational while safe.

Both deliberation and sagacity are virtues that inherently act as filters in that they process thinking in order for someone to arrive at a conclusion or take a decision: “Aristotle thinks that deliberation is the principal manifestation of the practical effectiveness of intelligence” [32]. Deliberation (*euboulia*) in the context of a post-industrial *phronēsis* regarding AR games and drone use in public means to think, and carefully decide about the ways through which a technological entertainment practice may or may not cause discontinuities in the function of public life. Public function is based on a set of globalized social rules, which are empirically tested and verified as appropriate and legitimate, and they include safety of the others and ourselves, respect of their presence and activities, and reciprocal understanding of what needs to be done in order for the others to carry out whatever they are doing.

The negative effect of the industrial revolution was that for economic reasons equipment and machines brought in a person’s everyday life phenomena like noise and pollution. The danger of postindustrial and personalized media is for a person the loss of touch with public sense in favor of his/her own entertainment and fall into escapism: “Pokémon Go is a new distraction for drivers and pedestrians, and safety messages are scarce. Delayed reaction to mobile phone distractions has hampered public safety” [33] Deliberation is a character trait for anticipating these consequences between public rights and technological rights.

Social rules of public life are not only empirically tested but through their diachronic use they acquire their own historicity, and through that, public life introduces itself in our mind as a sheltered sphere of multiple activities where one can feel safe and respectable, independently of race, gender, taste of fashion, or social class. This historicity (of safety and respect), which is

based on public performances of social behavior, connects the existential to the public sphere in the most rhythmic manner possible and through that it achieves this transition with the less possible production of anxiety. Hence, sagacity (*sunesis*) through self-control represents a form of perceptiveness that would be able to understand the technical discontinuities caused by the epistemic gap between physical and virtual, terrestrial and aerial, and apprehend the anxious results this gap can motivate to a number of people that may bewilder or feel alienated by a senseless exercise of technological entertainment practices in public. Sagacity secures psychology of the public life from such events since it guarantees that existential and psychological factors are equally important with external social rules of behavior.

Cleverness (*deinotia*) is the first of the two enterprising intellectual skills and its role is to produce ways that based on the two previous trait virtues can ensure that both robotic and AR entertainment will be further developed and expanded. Cleverness with its inventive ethos is able to create new forms of crossroads between physical and virtual, terrestrial and aerial technologies, which will introduce this increasingly innovative and global practice through the public sphere via multiple interplays of activities and related themes in order to develop and organize the intensified interest for these technologies. It is crucial to understand cleverness as an extended continuation of the two aforementioned character virtues (deliberation and sagacity), since without them, cleverness regarding these practices can easily turn through marketwise processes into merchandized services that by “exploiting” the epistemic gap and its social consequences create specialized environments either for AR games or for drone flights: “If a company decides to use *Pokémon Go* for developing a layer of commercially relevant interests, there is little in terms of conventional laws and regulations to stop them. This erodes the commons, and instrumentalizes for private profit a space originally open and regulated for the benefit of the many” [34]. When intellectual virtues like cleverness grow without character virtues that would assimilate the collision between different virtue motives (e.g., physical motive vs. virtual motive) as it has been discussed in the first section, then strict laws and merchant thinking are taking over, the first the safety of the social regularity and the second the “sheltered” defense of entertainment practices through the creation of corresponding products and services.

Finally, judgment (*gnomē*) represents the completion of *phronēsis*, since it is in judgment where the accuracy or the weakness of a behavioral performance approximates or diverges from *phronetic* virtue. Through judgment, the three previous character traits and skills are exposing themselves as *phronetic* or *aphronetic*. The incidents, accidents, and concerns of the first two sections regarding AR technologies (i.e., *Pokémon Go*) and drone robotics can be described as the result of *aphronetic*, that is, imprudent approaches of technological uses in the public sphere. But what *aphronetic* means in practice is that one or more of the aforementioned traits or skills has not been adequately preformed or included in the *phronetic* process. Hence, even if there is a virtue motive in every technological performance that got in conflict with other (physical) motives in the social sphere, technical *phronēsis* has not been achieved in all these problematic cases: “Skills are teleological in that they have a goal or a purpose and the general principles of solving the problem of attaining goals are constituted as *phronesis*. *Phronesis* itself is not a skill, for it has no logos of its own. Rather, it is embodied within the logos of each skill” [35]. Hence, post-industrial *phronēsis* should be able, unlike traditional virtue epistemology



which is based entirely upon hypothetical arguments to clarify through technological praxis, that character traits like deliberation and sagacity facilitate intellectual skills in order for them to transform and become *phronēsis*: “Longterm, rigorously designed studies should look at mechanisms of effective Internet-based interventions such as cooperation, competition, nostalgia, intermittent reinforcement, sense of control, and augmented reality” [36]. At the same time, character traits are also unable to distinguish as *phronēsis* by themselves unless they intermingle with intellectual skills like cleverness and judgment.

Conclusively, the suggestion of this model for a post-industrial *phronēsis* used two different forms of virtue elements, the first two were character-trait virtues and the second intellectual skills. I have described the first two as assimilative to the extent that they both include elements of perceptiveness of an environment which in this case is composed by social, psychological, and historical factors of behavior that needed to be understood by the appropriate character traits like deliberation and sagacity. This understanding, executed by these character traits, composes a field of knowledge, which is practical and social, and since the performances of both AR games and drones are public, knowing the field and the conditions that compose it is a prerequisite of the game rules. Therefore, public sphere and its corresponding *savoir vivre* and *faire* social rules should be seen as an essential part of the game/flight entertainment. But by being part of these processes and in order to be a virtuous player or pilot means to have knowledge of these rules and respond to this knowledge appropriately. When the latter occurs in technological processes of respatialization, post-industrial *phronēsis* takes place.

## 5. Technological epistemology and postindustrial intellect

By arguing epistemically about the ethical basis of “know how to play” and “know how to use,” virtue epistemology not only introduces present and future generations into an epistemic ethics of technological responsibility in a field of unexpected dangers and side effects but also updates our epistemological understanding by redefining the boundaries across which socially and ethically—but most important practically and thus functionally—philosophical inquiry can draw the line between technological character and intellect liability on the one hand and technological irresponsibility and senselessness on the other (i.e., the systematic repetition of a mistaken *savoir vivre* and a mistaken *savoir faire*). Technology updates the conditions of living [37] and therefore the conditions of knowing and accordingly acting. Based on this fact, virtue epistemology is necessary, in order to create the epistemic basis of ethical conduct between technological order and conditions of living.

The argument of the third section attempted a synthesis of four supplementary virtues in Aristotle that I have used, by distinguishing them into character traits and intellectual traits. The argument suggested that each group of traits is unable by itself and solely by itself to formulate the virtue of *phronēsis*, but instead in order for this to be achieved, the two groups should associate in order for the assimilative traits to absorb the gap between physical and technological respatialization with responsibility, whereas the enterprising to achieve skill competition and develop further the technical characteristics of these new global



entertainments. This analysis, persuasively or not, has targeted to present a new possibility where virtues and postindustrial intellect can and should interweave in a world that does not go global and digital only materially but from within, where within means socially and anthropologically.

In such an internal transformation, daily and historical human phenomena and concepts such as friendship, workplace, love, society, university, and even the concept of truth are under alteration. Since all these concepts are related with one way or another with human intellect, it becomes necessary to examine what are the consequences of a post-industrial intellect that acts imprudently with (nano)technological strains that move from virtuality to reality and from terrestrial to aerial functions. In specific, one needs to consider how this intellect can be developed if virtue adoption fails: "The clear implication is that immersion in a vulgar, degrading mass culture cannot have any such effect. If anything, it is likely to have a brutalizing effect, making one more mean-spirited, self-indulgent, less open to loftier feelings, and hence less given to the pursuit of virtue" [38].

According to Bernard Stiegler: "To live in the extremely complex milieus that deploy this industrial and planetary technical system, a system capable of unleashing colossal power at any instant, requires of the people traversing them that they maintain a blind trust" [39]. There are at least two crucial factors that one has to underline in order to penetrate into a very possible dystopic scenario: the first one is the miniaturization of technicity via nanotechnology and the second is the liquidation of ethics [39], through narcissism that expresses itself as total ignorance of applied virtues (stupidity) or in an even worse scenario as a disbelief in the value of virtues (cynicism).

Post-industrial intellect suffers first and foremost ethically and then intellectually, to the extent that it fails to synthesize and then follow and perform in a virtuous order. Technological miniaturization of personalized technologies on the one hand and the globalization of narcissism through videographic entertainment on the other disregard when they do not flirt with phenomena of stupidity, whereas they silently approve cynicism as a cultural extension and a necessary evil of a competitive lifestyle: "The technology to produce a destructive nanobot seems considerably easier to develop than the technology to create an effective defense against such an attack (a global nanotech immune system, an "active shield". It is therefore likely that there will be a period of vulnerability during which this technology must be prevented from coming into the wrong hands. Yet the technology could prove hard to regulate, since it does not require rare radioactive isotopes or large, easily identifiable manufacturing plants, as does production of nuclear weapons" [40]. Both Bostrom and Stiegler refer to dangers, the first by highlighting miniaturization and the second narcissistic cynicism and stupidity. The first analysis refers to long-scale effects of an imprudent performance and the second to a short-scale daily basis behavior based on the lack of *savoir vivre* and *faire*.

Technical prudence and technological education go hand in hand and it is obvious that the late twentieth century's educational systems did not manage to supervise what was to become the twenty-first century cultural addiction, screengazing: the cultural phenomenon where communication, observation, and human interaction are substituted by the digital videographic alphabet of Youtube and Facebook, "where most people are independently staring at their own

individual screens in parks" [41]. Repetitive senselessness regarding technological misuse, especially in the form of entertainment, that expresses itself intellectually either as stupidity or as cynicism represents the mental consequences of the screengaze phenomenon: "Screens are evolving at a speed that dwarfs the ability of the research community's ability to follow their deleterious effects. Public health researchers, practitioners, and policy makers are left with two options: admit failure, or strive for adaptability when messaging to the public" [42]. Apart from that, there are biological reasons like "the limitation of our observation capacities to only one level at a time" [43], which need to be stretched as part of a postindustrial virtue epistemology that can and should be developed further philosophically and incorporated in educational systems: "With the inevitable future growth in software that bridges the virtual world with the real world, guidelines to prevent potential adverse consequences should be arranged" [44].

## 6. Conclusions

The discussion about the possibilities of a post-industrial *phronēsis*, which is based on a technical prudence, composed by supplementary traits and skills concerns the present and the future use of daily personalized technologies in public space. The basic argument of the chapter was that AR games and the use of robotics in public while globalizing the local create objective dangers that emanate from processes of respatialization. In AR games, respatialization is taking the form of an interplay between virtual and actual, whereas in drones between terrestrial and aerial occupation and movement. That causes ethical and social consequences as a result of an epistemic gap, between physical spatialization and technical respatialization. The main difference from older forms of respatialization (cinema and airplane) lies in the representational and ontological intersection (AR games), and private microtechnologies flights. Since both of them become digitally personalized, then the main argument of the chapter was that an ethical approach should be based upon a connection of virtue epistemology with post-industrial use of these technologies. In other words, that there must be a set of virtues that would correspond to the four basic components that would ensure the transition of a *savoir vivre* and a *savoir faire*, from physical to digital devices use and public behavior.

The latter would consist of (a) the bridging of social responsibility with public rights, (b) setting up the ground through perceptiveness of public psychological factors such as anxiety caused by these uses, (c) ensuring responsibility while increasing skill competition and enthusiasm, and (d) setting and evaluating in practice the formation of a technical intellect from a moral and cognitive perspective. The argument proposed four components, two of which are assimilative character traits, like deliberation and sagacity, whereas the other two are enterprising intellectual skills like cleverness and judgment. The argument suggested that it is only through their mutual incorporation that a post-industrial *phronēsis* becomes achievable, since neither character traits nor intellectual skills are adequate for the completion of a phronetic process by themselves.

Finally, the chapter presented the view that imprudent or aphronetic performance multiplies the danger caused by miniaturization of devices leading to great catastrophes (long-scale effects of imprudent performances), or by narcissistic cynicism and stupidity leading to an insecure and disturbed public life by inappropriate practicing.

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