'Doing Things with Numbers': The Quantified Self and the Gamification of Health

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ABSTRACT

Software applications are changing the relationship people have with their health. There are individuals who intensively self-track their activities and physiological states. These so-called "Quantified Selfers" think that a data-driven life can enhance their health status. Indeed, recent research has demonstrated the effective utility of some apps for health. In addition, "gamification" – that is the use of game design elements in non-game contexts – can serve to increase individuals' health. Gamification facilitates and supports our pursuit of goals and appears to enhance performance. However, while apps seem to support health, there are some risks to be considered: quantification and gamification can foster a neoliberal idea of health as a personal responsibility, bracketing the fundamental role played by social determinants in shaping health status. Moreover, some health insurance companies are rewarding individuals who agree to share their self-tracking data with them. The risk is that what is an individual option today may become a social constraint or requirement tomorrow.

Key-words: quantified-self, gamification, technological solutionism, endopticon, quantification

Introduction

At present, there are about 100,000 software applications – apps – related to health and wellness (EC, 2014). In fact, digital technologies, and mainly the apps we use in smartphones and tables, can collect, store and elaborate enormous amounts of data. We can count the steps taken in one day, the distance and speed of our running, the length and quality of our sleep, and our daily caloric intake. Moreover, we can measure stress levels simply by putting a finger on a smartphone sensor and blood sugar levels on a device that can be plugged in the smartphone.

While some of this computing power is not new - thirty years ago calculators performed very complicated algebraic and statics operations and were even smaller than smartphones - the difference

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lies in the fact that today we are able to collect data on ourselves and share them on line in real time with thousands – if not millions - of other people.

In many cases, apps serve a motivational purpose. These apps invite us to achieve goals like running 10 miles, go a month without drinking any alcohol, or spending less than 20 dollars a day. Moreover, we can receive encouragement and support simply by sharing our personal data online. As a consequence of these astonishing opportunities, a self-tracking culture focused on human enhancement is spreading (Maturo 2012). There are people who self-track a large number of activities and take it quite seriously, *"quantified selfers"*.

These enhancing activities require dedication and self-discipline. In order to help individuals to maintain their self-commitments – which often are undertaken on social networks - these activities are framed, by the app, in terms of *loisir*, that is of gamification. Indeed, quantification and gamification seem to be two very useful strategies for changing some lifestyle habits like quitting smoking, eating less fat or saving money. Yet, some questions emerge: which conceptions of normality emerge from the Quantified Self and the process of gamification? How will the new possibilities of health management opened by the Quantified Self impact health policy? How will the powerful capacity of quantification captured by apps affect health behaviors? This article is an attempt to provide answers to these questions

1. Never More a Man without Quantities

Until recently, only athletes engaged in self-measurement. Today, however, this practice has spread to other social spheres. There are people who regularly track and share some common opinions about self-tracking, a population we have termed "quantified selfers." The main aspects related to the Quantified Self (QS) can be found on the site quantifedself.com. The site was developed by Gary Wolf and Kevin Kelly, at that time editors of Wired Magazine. With its slogan "Self-knowledge through numbers," the site has stimulated the creation of groups of *"quantified selfers"* in more than one hundred cities, many local conferences and an annual global "meet up." There is also a blog where quantified selfers recount their experiences with self-tracking and reflect on the effectiveness of such tracking for changing one's habits. Most of the shared data concerns running, weight loss, and caloric intake. There are also a video archive in which the self-trackers describe new experiences with self-tracking. For example, Ian B. "started with a self designed Excel spreadsheet where he manually tracked every five minutes using his own tagging system. He's since switched to even more fine-grained tracking, tagging every minute of his life to describe what he was doing and who he was with." M.B. talks about a few of his

experiments at Boston QS meet up group: "including tracking garbage and possessions, understanding social life through random photo taking, and learning about his optimal exercise."[1]

The best account of the "philosophy" of the QS is described by Wolf in a dense article, entitled "The Data-Driven Life," published in the New York Times in 2010. The article is based on an observation and a question: "Humans make errors. We make errors of fact and errors of judgment." This is due to the fact that we take decisions on the basis of partial information. Hence, the (rhetorical) question that arises is: "We use numbers when we want to tune up a car, analyze a chemical reaction, predict the outcome of an election. We use numbers to optimize an assembly line. Why not use numbers on ourselves?" (Wolf, 2010, p. MM38). Moreover, according to Wolf (2010), there are four factors underlying the birth of the QS: First, electronic sensors got smaller and better. Second, people started carrying powerful computing devices, typically disguised as mobile phones. Third, social media has provided an acceptable platform for sharing every aspect of one's daily life. And fourth, the rise of a global superintelligence known as the cloud facilitates data collection and sharing. The basic assumption of the Quantified Self is that through the collection and computation of data regarding our own behavior – whether it be number of hours worked, miles run or cigarettes smoked – we are motivated to improve.

Ruckenstein (2014) carried out an empirical investigation on heart-rate variability measurement. The investigation was based on the concept of "double data" (Lupton, 2012; Elmer 2003), that is, the conversion of human bodies and minds into data flows that can be figuratively reassembled for the purposes of personal reflection and interaction. The study found that, after viewing the construction of their personal analytics from self-tracking data, the participants "were fascinated by the ways in which combining different data flows might deepen their bodily understanding and self-awareness." (Ruckenstein, 2014 p.75). Further, it can be said that "self-monitoring devices are often seen as benevolent and responsive, not least because it aids people in coping with prevailing moral imperatives of being healthy and becoming healthier" (Ruckenstein, 2014 p.75) – with some notable exceptions like pro-anorexia groups (Ruckenstein, 2014 p.71).

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[1] Both the quotations are taken from the description of their talks, available at the video section of http://quantifiedself.com/ (Jan 06, 2015).

The ability to quantify one's self invites us to become self-entrepreneurs that optimize our performance. The QS mentality is suggestive of a sort of Taylorism, on an individual scale and not tied to the factory – or perhaps a reframing of the individual as an individual factory. This is a pleasurable Taylorism, given the appealing designs of apps and their increasing game-like qualities, or gamification. In short, the Quantifed Self aims to reconnect what Max Weber separated. According to Weber, "The modern rational organization of the capitalistic enterprise would not have been possible without two other important factors in its development: the separation of business from the household, which completely dominates modern economic life, and closely connected with it, rational book-keeping." (Weber, 1992: p. `XXXV, orig. version, 1930). Today, we are invited to organize our domestic duties – and even our sexual life (Lupton, 2014) – with the same principles and methodologies of an enterprise: "The imposition, on oneself or one's family, of a regime of objective record keeping seemed ridiculous. A journal was respectable. A spreadsheet was creepy. And yet, almost imperceptibly, numbers are infiltrating the last redoubts of the personal. Sleep, exercise, sex, food, mood, location, alertness, productivity, even spiritual well-being are being tracked and measured, shared and displayed." (Wolf, 2010, p. MM38). Yet, it must be said that many self-measurements are not related to self-enhancement actions, but rather to biometric data capturing measures of chronic disease; therefore there are also some forms of self-tracking that are not motivational. Indeed, apps, and more generally telecommunication media, allow remote interactions between patients and medical professions that are revolutionizing health care including diagnosis, prescribing medical treatments, monitoring health parameters, safety surveillance, providing self-care instructions, patient education and psychological and social support (EC, 2014; Swallow, 2014; Belsarlo et al., 2013; Cipolla, 2013; Pols, 2012; Shermer 2009).

There are some critics who caution against enthusiastic declarations regarding the potentialities of self tracking. In fact, a recent study done on the Quantified Self discovered a general decrease in enthusiasm among self-trackers after some months of self-tracking (Choe et al., 2014). However, it can be said that the QS ideology is a positivistic one. And "positivism" here carries two different connotations. The first meaning, has to do with its etymology: positum, in latin means grounded, "given", in reality, semantically it is close to the meaning of the verb "to posit." This is also the sense attributed to postivism in the social sciences. The other meaning we can attach to the term in relation to the QS, is "optimism". As Ruckenstein observes, "The theme of optimization has become an important element of the QS movement via maintaining an optimistic and solution oriented quality to the discourse on personal analytics" (Ruckenstein, 2014 p.70). Putting together the two connotations, the result is an immense trust

on data. It is not by chance that enthusiasm for data and optimism about data are closely tied to the idea of gaming. In fact, an important component of the QS is gamification.

2. The Gamification of Life

Gamification can be defined as the use of game design elements in non-game contexts (Groh, 2012). Game-like mechanisms in non-game scenarios are incorporated in order "to increase influence and encourage engagement and activity" (Luminea, 2013 p.13). For example, when our smartphone screen flashes if we run faster than usual or the virtual congratulations we receive from other anonymous users if we successfully reduce the number of coffees we drink in a week, we are encouraged to continue in our efforts. We can have fun, even when saving money. At least this is the aim of Toshl, an app which functions like the old expenses notebook. Indeed, the first review posted on Google Play notes, Toshl is a "personal expense tracker made fun." More specifically, Toshl "allows us to understand where we spend our money as it tracks expenses and incomes with ease, it makes budgets for specific tags and it compares the rate of your spending with the time of the month." To sum up, "Toshl is like your personal financial advisor that is with you all the time. Except it is less awkward in bed."

According to Barber (2007) consumer society fosters the growth of an infantilistic ethos. This happens because the infantilization of the consumer is the best way to create new needs – needs to which – the market can answer through new goods and services. Now, given that neoliberism invites individual consumers to keep a portion of themselves at an infancy-level, which place will boring and challenging activities occupy in such a society? Exerting oneself and working hard are the opposite of what characterizes infantilization. Therefore, "serious" actions – that is, labor, hard work and other boring things – must be dressed up as *loisir*. Today, thanks to apps it is possible to work, to do self-care, to study but under the guise of playing a game. Thus, gamification is consistent and coherent with the infantilization promoted by consumeristic capitalism.

Games serve irreplaceable functions in socialization and in learning. As Erikson wrote in 1963: "the child's play is the infantile form of the human ability to deal with experience by creating model situations and to master reality by experiment and planning" (Erikson,1963, p. 372). In the realm of sociology, George Herbert Mead (1934) stressed the importance of playing games as children for the development of the self some decades before Erikson. These theories allow us to grasp the cognitive potentialities of games. It is not by chance, therefore, that gamification is considered the most innovative and promising marketing strategy (Luminea, 2013) and learning program (Groh, 2012). Through gamification, app designers make it easier to carry out arduous and burdensome activities. Strenghtening

our motivations, gamified apps help us to modify harmful habits. In fact, among the most popular apps there are the ones designed to help users to quit smoking or to reduce fat and junk food intake (The Economist, 2012). Some scholars are optimistic that the "ludification of culture" will play an important role in the near future. As noted by Jagoda (2013), gamification is increasingly conceived as a "cutting-edge panacea" (2013, p. 115). According to McGonigal (2011), one of the most enthusiastic proponents of gamification, thanks to gamification we will soon be able to solve the biggest problems of the world, such as cancer and climate change: "new participation platforms and collaboration environments are making it possible for anyone to help invent the future, just by playing a game" (McGonigal, 2011, p.15). However, without embracing these eschatological scenarios: "games have been shown, in a number of contexts, to activate a wide range of learning and thought styles, promote prosocial behavior, foster both cognitive and emotional empathy, model alternate modes of action, and enable players to frame problems differently through procedural interaction" (Jagoda, 2013 p. 125).

In the realm of health-care, using gamification is promising. For example, some good results have been achieved in increasing patients' adherence to prescriptions and therapies (Cummings et al, 2013). As mentioned previously, there are a conspicuous number of apps that are designed to reinforce motivations, specifically concerning self-care and patient compliance: "One way gamification addresses this challenge is by creating a virtual environment that encourages the user to have fun and feel a sense of empowerment: winning points, badges or status and advancing through a hierarchy of different levels (think Angry Birds). By creating an enjoyable gaming experience, patients are more likely to engage and improve their self-care" (Drell, 2014, p.24). Moreover, gamification may offer very useful tools for professionals involved in the care of patients suffering from Alzheimer's disease (Roberts and other, 2014). Hence, gamification appears to facilitate and support efforts to achieve our goals and enhance our performance. A strenuous activity is translated into a playful experience and therefore making it less onerous . At this point, it should be noted that games not only enable individuals to understand or get socialized to new situations – they also provide a way for us to alter reality. Gamification has a performative aspect. This performative aspect can be connected to other conceptions of games not yet discussed. Without delving too far into speculative philosophy, we can observehow also Wittegestein's theories of language transformed our understanding of language as a faithful mirror of empirical reality to a less rigid conception of language as made up of communicative actions called "linguistic games." In other words, with his concept of linguistic games, Wittgenstein (1967, or. vers. 1921) shifts away from his previous concept of logical language expressed in the Tractatus logico-philosophicus (1961, orig. vers.

1917). For this "second" Wittgenstein, the meanings of communicative actions should not be found in their relationships with the objects of the world, but rather emerge from the linguistic contexts in which they are enacted.

On the basis of Wittgestein's theory of linguistic games, Austin (1962) stresses the importance of the perlocutionary aspect of linguistic acts, along with the semantic aspect. That is, linguistic acts not only say something, but they *do* something. Linguistic acts have real effects. Through linguistic acts, we can make promises, declare two persons husband and wife, or give a name to a boat. The (linguistic) game not only allows us to represent and to understand new aspects of the world – as described by Erikson, Mead, Freud – but makes it possible to do things. It is not by chance that Austin titles the book in which he proposes this theory *How to do things with words*.

3. Glamorizing Numbers

Quantification has never been so intensively central in our society as it is today. Perhaps it is so important that we take it for granted. In this context, Espeland and Stevens (2009) propose a sociology of quantification. Quoting Austin (1962), Espeland and Stevens (2009) affirm that "we can do things with numbers."[2] A sociology of quantification is well suited to the question of gamification, as the main trait of gamification is quantification: "Gamification practices, operating under the umbrella of play, foster a quantification of the self; collecting, collating and analyzing minute data and providing feedback on how to better care for one's self." (Whitson, 2013, 167). In order to sustain their proposal about the performative strength of numbers, Espeland and Stevens provide some convincing examples of the role played by census data in order "to inform social policy, assess business opportunities, report news, measure progress" (2009, p.406).

Yet another case from the realm of health demonstrates the power of numbers: the Diagnostic and Statistical Manual, or DSM. The Diagnostic and Statistical Manual of Mental Disorders is the basis of any mental disorder diagnosis. While the first two editions of the DSM were characterized by a strong theoretical view, mainly based on psychoanalysis, the DSM-III and, even more, the DSM-IV and the DSM V try to be atheoretical and symptom-based (Horwitz, 2010). To define an illness the emphasis is put on the numbers and length of symptoms while causes are neglected. The focus has therefore shifted from

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[2] I would like to thank Espeland and Stevens for the inspiration for the title of this article.

illnesses to disorders and syndromes – the latter being a specific *number* of symptoms occurred for a specific *number* of weeks (Maturo and Barker, 2010). The key assumption of diagnostic psychiatry is that overt symptoms indicate discrete underlying diseases. Whenever *enough* symptoms are present to meet the criteria for a diagnosis, a particular mental disorder exists' (Horwitz, 2010). There are not any explanatory aims in the last versions of the DSM: symptomatology takes the place of etiology.

The syndromization of mental illness has multiplied the number of mental disorders and increased the chances a patient will receive a diagnosis (Horwitz 2010; Williams, Gabe and Davies 2008). What once was considered something located in the depths of our unconscious – mental illness – is framed today as an observable and measurable phenomenon. Moreover, "Commensuration creates a specific type of relationship among objects. It transforms all difference into quantity. In doing so it unites objects by encompassing them under a shared cognitive system" (Espeland and Stevens, 2008, p. 408). Therefore, quantification allows standardization, that is: "a process of constructing uniformities across time and space, through the generation of agreed-upon rules" (Timmermans and Epstein, 2010, p. 71). Standards characteristically sink "below the level of social visibility, eventually becoming part of the taken for granted technical and moral infrastructure of modern life" (Timmermans and Epstein, 2010, p. 71).

Espeland and Stevens also remark that "Rigorous, defensible and enduring systems of quantification require expertise, discipline, coordination and many kinds of resources, including time, money, and political muscle. This is why quantification is often the work of large bureaucracies." (Espeland and Stevens, 2008, p. 411). This was appropriate and true in 2008 and also for the 150 years leading up to 2008, but the situation has changed in the years since they wrote. Numbers can be captured, created, elaborated and stored by individuals. Quantification, even sophisticated quantification, can occur at an individual level. At first, this appears to be a great achievement, a democratic blow for everyone. Anybody can self-quantify his or her own activities. Yet, the use of such tools on an individual level can also lead to social constrains. Two examples can clarify this concern.

First, Facebook and Apple are offering their female employees the "option" to freeze their eggs in order to better plan their professional careers. But will those who do not take advantage of this option and decide to take a maternity leave have the same career opportunities enjoyed by those who chose to delay childbearing? What if the majority of female employees of FB and Apple choose to freeze their eggs? Would the minority be considered less devoted to their employers? Who will get promoted?

Second, "Pact" is a motivational app which is very famous because it is an app that "pays you" for working out and for keeping to a diet: "To use the app, you can chose to make a "pact" to exercise, log

your meals on MyFitnessPal.com or eat vegetables for a certain number of days. When you sign up for a pact, you select a certain amount – $5 or $10 – that is deducted from your credit card or PayPal account for each day you miss. If you hit your goal, then you get paid a reward ranging from 30 cents to $5 per week until you accumulate $10. That payout comes out of the pool of money collected from people who did not fulfill their pacts.[3] Pact is also the first app that was used as a tool by insurance companies. In October 2014,

> the health tracking app Pact became the first, freely available smartphone application to launch its own health plan for employers, called Pact Health. It's an insurance service in all but name since Pact can offer extra coverage the more you exercise, but the 15-person startup is calling it a health "plan" to avoid the extra regulatory scrutiny. Acting as a layer on top of a current policy, people working at companies who buy Pact Health can gain or lose $5 off their deductible coverage based on how faithfully they stick to workouts — all tracked by their smartphones and health monitoring devices like the Jawbone Up or Fitbit.[6]

Punishing insurance members for unhealthy metrics is nothing new. *Safeway*, the grocery chain, has famously reduced its health care costs by taking away premium discounts from staff who don't do well on regular biometric scans. But "that's a very crude way of using negative incentives," says Zhang" – the 26 years CEO of Pact - There is, in other words, a subtle art to effectively punishing people. Pact has learned you have to give people a chance to redeem themselves. Once its users lose $5 for not fulfilling a workout, they have two weeks to recover that money back along with any extra rewards."[4]

The effects of gamification can be understood using the Foucauldian concept of governmentality, that is the idea of a disciplinary power that promotes life, which comes not from above or from a center but is diffuse and penetrates our bodies and is everything but repressive (Foucault, 1977). It is a soft power enacted and strengthened by the actions, the attitudes, and the wishes of the individuals it influences. The only lingering influence of modernity is the idea of a punishment. However, this is just a semantic misunderstanding: the punishment is not a "pastoral" one (one inflicted by the good shepherd) nor it is a juridical one. It is more akin to a missed bonus in a videogame or losing points in a game we play on our smart phones. And yet this does not mean that consequences cannot be serious.

As noted by Deborah Lupton, while commenting the use Foucault (1977) made of Bentham's concept of panopticon: "The concept included the idea not only that prisoners should be observed by

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[3] Shu C, GymPact, The App That Pays You For Working Out Relaunches As App With New Dieting Features http://techcrunch.com/2014/01/01/pact/ (07/12/2014).
[4] Olson P., Pact Is First Health App To Become An Insurance Plan, Forbes 10/14/2014, http://www.forbes.com/sites/parmyolson/2014/10/14/pact-health-app-insurance-plan/ (08/12/2014)

those in authority, but also that they should ideally develop self-surveillance and disciplining strategies in the effort to improve themselves" (Lupton, 2012, p. 235). In the realm of health, this includes self-management skills in order to stay healthy. Indeed, with self-tracking and the quantified-self we are relocating surveillance within ourselves, as Foucault suggested: "The panoptic schema, without disappearing as such or losing any of its properties, was destined to spread throughout the social body (…) its vocation was to become a generalized function" (1977, p. 207). Today, there is not a centralized observer (or someone pretending to observe): on the contrary, every self asks to be controlled or, better, "liked" by the many. Whitson (2013), commenting Albrechtslund (2008), observes that it would be more appropriate to talk about *participatory surveillance* based on social and playful aspects of surveillance "that are otherwise ignored by the hierarchical (i. e. panoptic) model of surveillance" (Whitson, 2013, p. 172). This changes the role of the user from passive to active, "since surveillance in this context offers opportunities to take action, seek information and communicate" (Albrechtsund 2008, cit. in Whitson, 2013, p. 172). But at the same time self-tracking technologies permit also self-surveillance in the most intimate spheres: what is more private than our physiological states? As such, perhaps it is more appropriate to discuss the *endopticon* than the panopticon in this mass-intimacy society.

Apps create digital-based narratives of health that imply that individuals can choose whether or not stay healthy. Moreover, individuals make their health data "social" (that is, public). On a social level this option has consequences, as noted by Morozov (2013, p. 239): "If I choose to track and publicize my health, and you choose not to, then sooner or later your decision to do nothing might be seen as tacit acknowledgement that you have something to hide." Thus, going further with this way of reasoning, Morozov concludes that "when some members of society choose to self-track and self-disclose – and presumably those who do choose to self-disclose have little to fear from disclosure – it becomes much harder, if not outright impossible, for everyone (including those who'd rather keep their data from themselves) not to self-disclose" (2013, p. 240).

In sum, this perspective emphasizing health self-management – which in some ways is a valuable approach – conceives an individual as totally responsible for her health status. While it is true that apps can help individuals to improve lifestyles and therefore reduce their risk factors, social conditions, which sociologists know are the origin of health disparities, should not be bracketed. According to the fundamental cause theory, social conditions powerfully shape individuals' capacity to modify or eliminate

identified risk factors, "rendering less than fully effective an approach that addresses only risk factors

mechanisms" (Link and Phelan, 2010, p.4). In other words, the social cohesion of a community and

individual lifestyles are strongly affected by work, income and level of education (Ross & Mirosky, 2010).

The de-politicization of health and its reduction to an individual issue managed by apps deny the need for

any state intervention for the welfare of the community. It brackets the importance of social policy and

social justice issues (Maturo, 2012; Maturo 2014).

4. Conclusions: The Virtues and Perils of the 'Endopticon'

The quantification and gamification of health promoted by apps presents advantages and

disadvantages. The main advantage emerges from the behavioral-performative aspect: apps support

behavior change and the achievement of healthy lifestyles. This is undoubtedly a central priority for

individuals and health care systems. Healthier lifestyles would improve population health and reduce

health expenditures. As stated in the Green Paper on Mobile Health edited by the European Commission

in 2014: "Through sensors and mobile apps, mHealth allows the collection of considerable medical,

physiological, lifestyle, daily activity and environmental data. This could serve as a basis for evidence-

driven care practice and research activities, while facilitating patients' access to their health information

anywhere and at any time (…) mHealth has the potential to play a key role in transforming our lives for the

better" (EC, 2014, p.3-4).

Among a few problematic aspects, there is the risk of the extremization of a neoliberal conception

of the self by which health comes to be considered an individual issue disconnected from social inequality

and other socio-economic factors which heavily affect the individual's chances to stay healthy (Link and

Phelan, 2010). This would likely result in a society which considers health a commodity like all others, and

not a social right that the State should protect and promote. There is evidence suggestive of this trend.

Some health insurance companies have started to offer a discount on premiums to members who agree

to collect and share self-tracking data with them. Clearly, the discount is given only to the workers who

have healthy habits. At first sight, this can seem as a win-win trade off. Yet, what today is presented as an

individual option can easily become a requirement. It is entirely possible that, in the future, refusing to

share such data would be considered a deviant behavior in and of itself.

We have proposed the neologism *endopticon* to capture the trend towards sharing and making

public one's own internal physiological states. In this way, the panopticon turns into self/mutual

surveillance. This concern is tied to issues of privacy. Obviously, this is a crucial problem. For example,

The "Angry Birds" app was suspected of sending private data to marketing firms after it was discovered

that the app tracked users' locations and device IDs[5]. At this point. it should be evident how quantification

and self-tracking accelerate and foster the "conceptual" medicalization of society (Conrad, 2009). We increasingly view ourselves as individuals that are determined by our biological makeup. Somatic individuals, or "beings whose individuality is, in part at least, grounded within our fleshly, corporeal existence, and who experience, articulate, judge, and act upon ourselves in part in the language of biomedicine" (Rose, 2008, p. 26). This is caused also by the role played by healthization in our lives: "The promotion and celebration of health as the paramount value of Western society has encouraged people to interpret a variety of human activities through the vocabulary of medicine" (Furedi, 2006, p. 14).

Quantification – that is data, measurements, the translation of life into numbers is a powerful – is a powerful engine for the medicalization of society. It supports the construction and reconstruction of the biologization and technoscientifization of language, that is the autopoiesis (Luhmann, 1995) and the self-legitimation of the medicalization of society. As discussed previously, the standardization of diagnosis resulting fromthe last versions of the DSM can provide an example of the link between medicalization and the quantified self. In both the phenomena, health is reduced to an algorithm. Health is no longer a complex issue, it is a complicated one. Complexity has to do with a system whose actions and states cannot be predicted; complication is closer to an elaborated device, even hyper-elaborated, but this device can be analytically described and reconstructed. A soccer game in the Champions League is a complex event; a piece of Ikea furniture is a complicated device. With the new iterations of the DSM, mental diseases become increasingly framed and constructed as syndromes which transforms complex diseases into complicated but standardized sets of co-morbidities. Therefore, the Quantified Self is an example of what Morozov labels "technological solutionism," or the inclination, fostered by internet, to look for the solution of extremely complex problems by relatively simple algorithms. For example, losing weight becomes a matter of caloric intake. Focusing on calories because they are easy to quantify is a limiting way to think about nutrition. This one-dimensional measuring is welcomed by corporations: "There is no reason why the food industry would feel threatened by self-trackers: as long as such schemes are tied to just one popular indicator, both the manufacturing and the marketing processes can be reconfigured accordingly" (Morozov,2013, p. 252).

More broadly, quantification transforms complex problems into a set of simpler issues for which it is easy find a (partial) solution. Of course, this is not a bad thing per se, yet when applied to dramatic

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[5] Murray R. (2013), Smartphone apps tracking location might shock you: Angry Birds, Brightest Flashlight app among most surprising offenders, Daily News, Jan 16th.

social problems it can produce false answers. To summarize, "The flight from thinking and the urge to replace human judgment with timeless truths produced by algorithms is the underlying driving force of solutionism" (Morozov,2013, p. 252). Using scientific terms to describe everyday life events is often tempting, but it can lead to the "fallacy of misplaced precision", which illustrated by the beginning of the famous book *The man without qualities* by Robert Musil:

> A barometric low hung over the Atlantic. It moved eastward toward a high-pressure area over Russia without as yet showing any inclination to bypass this high in a northerly direction. The isotherms and isotheres were functioning as they should. The air temperature was appropriate relative to the annual mean temperature and to the aperiodic monthly fluctuations of the temperature. The rising and setting of the sun, the moon, the phases of the moon, of Venus, of the rings of Saturn, and many other significant phenomena were all in accordance with the forecasts in the astronomical yearbooks. The water vapor in the air was at its maximal state of tension, while the humidity was minimal. In a word that characterizes the facts fairly accurately, even if it is a bit old-fashioned: It was a fine day in August 1913.

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