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Statistical Panopticism and Its Critique

Rainer Diaz-Bone *

Abstract: »*Statistischer Panoptismus und dessen Kritik*«. The article develops the concept of statistical panopticism, thereby combining the French approach of economics of convention (EC) and Michel Foucault's concept of panopticism. The differences between Foucault's original notion of panopticism and statistical panopticism are emphasized. It is argued that statistical panopticism has been made possible by the enormous growth of quantification, datafication, linking, and centralization of numerical data production, data collection, and data analysis. This has been (mainly) realized by private enterprises and implemented in different social spheres but also in private situations. From the perspective of EC, quantification, big data, and statistical panopticism have to be related to the foundational conventions of data production (measurement) and data interpretation. Foucault has analyzed the neoliberal and indirect form of contemporary governance. Statistical panopticism works as a dispositive for this neoliberal form of governance. Its asymmetric and mainly invisible character is sketched. Also the critique and the deficiencies of critique of political and economic usages of numerical data and indicators are discussed.

Keywords: Panopticism, Foucault, economics of convention, quantification, neoliberalism, big data, statistics.

1. Introduction

Sociology of quantification has studied not only the diversity and the impact of numbers in everyday life, science and mass media. It has studied also the ideological and hegemonic effects exerted by numbers in different social fields. Nowadays, in times of the Internet, of computerization, digitalization and datafication numbers are omnipresent. Key words like "big data," "smart data analysis," or "data mining" articulate these tendencies (Mayer-Schönberger and Cukier 2013; Kitchin 2014; Japec et al. 2015). Public demand for the representation by numbers is still increasing and the public as well as individuals request for "realistic" numbers, representing social facts "as they are". Trust in numbers is mainly based on trust in institutions generating those numbers as state administrations, scientific organizations, NGOs, and enterprises, which are recognized for their reputation. Trust in numbers supports recognized legit-

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imacy of information and facilitates communication (Porter 1995) and can enhance the efficiency and the power of governance. Quantification exerted via standardization equips numerical information with the image of objectivity. Phrases like "governing by numbers" (Desrosières 2008b) or "world of indicators" (Rottenburg et al. 2015) indicate from sociological standpoints the rising power of number-based governance.

From a sociological point of view there are two important areas of research, which aim to discover problems of legitimacy and the expulsion of public deliberation about the conventional foundations of measurement and data production. First, actors are less and less interested in the principles of data construction and its conventionalist bases (as definitions of indicators, which can be conceived as conventions). This disinterest is nourished by more and more complex procedures of data production, because of involved technologies, scientific conventions and because of an increasing degree of labor division in chains of data production. These aspects enhance the necessary effort to track the statistical chain and to understand the complexity of data production. Second, more and more data production processes are invisible for the public and are run by private agencies (as enterprises). These data are used for market research, geo-tracking, consumer scoring, crime prevention, and in many other ways, which provide companies with opportunities to make profit. But also governments step by step implemented data bases to represent, analyze and track their citizens. Public recognition and usages of numbers as societal representations step by step became more and more detached from the societal control and knowledge about conditions of data production. This growing cleavage between convention-based, technically complex data production on one side and public representations, usages, and expectations on the other side results in a public misrecognition (of what data represent), because the public rejects the idea of data as "social construction" based on conventions and influenced by involved techniques and practices of measurement. The public and everyday actors do expect data to be a "true representation" of a pre-given social reality, i.e., a reality in the sense most natural scientists conceive as one physical reality (independent of conventions, measurement techniques and measurement practices). Simultaneously, huge masses of data are gathered by state organizations and by private enterprises, which exploit big data for purposes of control and profit, detached from public deliberative legitimization.[1] Especially private companies generate and collect data, which are not based on established conventions (justifiable definitions), but which are measured "ad hoc", i.e., without a controlled implementation of an exact concept of what is to be measured,

[1] "Big data" is mostly characterized only by formal aspects. A common definition of big data is data which are characterized in "volume" (depth, breadth and amount of data), "velocity" (speed and volatility of data) and "variety" (the heterogeneity of data formats), see Kitchin (2014) and Japec et al. (2015).

how it is to be measured and for which purpose. As it will be argued below, the coherence and (political) adequacy of conventions with collective intentionality and common goods are important (as economics of convention argues), because this enables the production of indicators, numbers, and data, which can support collective action in a valid way.

The argument developed here is that political and economic governance in modern societies has invented a specific form of power, which was already analyzed by the French historian and sociologist Michel Foucault. Foucault identified a constellation of dispositives, which were aligned to survey and to control individual's behavior in modern societies, stimulating normed, standardized and self-exerted behavior by these individuals. The everyday immaterial and material practical mechanisms (of observing, inspecting, categorizing and hierarchizing, sanctioning etc.), which implanted these personal dispositions and formed modern social behavior, groups and categorical identities, were analyzed by Foucault as the microphysics of power and Foucault called this form of control "panopticism" (Foucault 1995). Nowadays, the importance of numerical data as a core element of this societal control and individual self-conduct rises, i.e., data and datafication become ubiquitous. Even if data usage is mostly detached by an adequate understanding of its genealogy, the pervasiveness of figures as upcoming forms of representing social phenomena and social trends but also one's social position, one's social and individual behavior is the cornerstone of the evaluation, valuation and control of modern individuals and the governance of modern populations. Therefore, one can speak of an upcoming "statistical panopticism" as a recent and powerful dispositive for the governance of the self and of others in the sense of Michel Foucault (2007a, 2008). Datafication and quantification have invaded not only the public sphere (mass media and state activities), but also the private sphere[2] – making individuals, groups and whole populations visible for different kinds of actors as private enterprises exploiting these "personal data" for their economic interest. And this visibility of "private" activities cannot be longer conceived as restricted to the immediate personal environment, as social media and the use of apps make evident. These data are accessible by other actors (as unknown Internet users, state institutions, private companies etc.) This upcoming phenomenon will be framed in a conceptual and exploratory way and its tensions and contradictions (as identified here in a preliminary way) will be discussed, referring

[2] By technologies as social media, growing video-surveillance, digitalization of the private life and new tools for self-quantification of personal life and their interconnection (buzz words are "Internet of things", "smart cities", "smart homes").

to Michel Foucault's work and the approach of economics of convention (in short EC).[3]

This contribution will first present EC as its theoretical and methodological starting point, which is also a main foundation for sociology of quantification (section 2). Foucault's concepts of power-knowledge and of panopticism will be introduced, related to the new forms of data-based governance and the concept of statistical panopticism will be introduced (section 3). Afterwards, some problems of contemporary social critique facing statistical panopticism as a form of (neoliberal) governance will be discussed from the perspective of economics of convention and compared to Foucault's earlier notion of panopticism (section 4). Finally, the new positioning of social research and its institutions will be considered, facing the growing influence of private organizations' expertise in the field of indicators and social sciences (section 5).

2. Economics of Convention and Statistics

The words "state" and "statistics" share the same semantical roots. The Italian word "etatista" means "men who care about state affairs". It was Alain Desrosières (1998, 2008a, 2008b, 2011a, 2011b), who worked out the most sophisticated sociological theory for the analysis of quantification, which is related to a "political economy of quantification" (Didier and Droesbeke 2014; Bruno et al. 2016; Diaz-Bone and Didier 2016), emphasizing the political dimension of statistics, data, and big data. He also was closely related to the interdisciplinary and transdisciplinary scientific movement of the "economics of convention" or "convention theory" (in short EC), which from the early 1980s on became a new complex and pragmatist institutionalism, and which nowadays is part of the new French social sciences (Corcuff 2011). This institutionalism readjusts the two "megaparadigms" of structuralism and pragmatism in a new way. It was the close cooperation between Desrosières and the founders of EC, which made the socio-economic analysis of classification and quantification one of the starting points of EC (Desrosières 2011a). Mainly Laurent Thévenot (2011, 2016a) and Robert Salais (2012, 2016), but also representatives of the second generation as Emmanuel Didier, Thomas Amossé, Cécile Brousse, Laura Centemeri, and others continued this strand of EC's research from the 1980s to the present. Also, Alain Desrosières worked in more and more a conventionalist position until his death in 2013, so that especially his later workings are regarded as being part of EC (Diaz-Bone 2018).

[3] This article continues a line of argument about quantification, measurement, and big data from the perspective of economics of convention, which was initiated in two contributions to this journal (see Diaz-Bone 2016, 2017).

Convention theory focuses on coordination between actors, who rely on a plurality of conventions as logics of coordination, interpretation and evaluation in situations (Storper and Salais 1997; Favereau and Lazega 2002).[4] For EC, conventions are not to be confused with customs or standards only. Instead, conventions are understood as metaphysical principles, present in empirical situations as imaginary culturally established frames, actors can rely on to achieve a common goal and a common good (Boltanski and Thévenot 2006). As a pragmatist institutionalism EC acknowledges actor's competences to judge the adequacy of conventions, to adapt to conventions and to switch conventions if needed (Dosse 1998a; Nachi 2006; Corcuff 2011). EC integrates the material equipment of situations with cognitive formats and objects (Boltanski and Thévenot 2006). In recent years, EC became more and more known outside of France.[5]

One of EC's birth moments has been the analysis of statistical categories at the French *National Institute for Statistics and Economic Analysis* (INSEE). Categories, categorization and quantitative (metric) measurement are all conceived as being based on conventions, how to define categories and how to apply measurement instruments (as classifications, metric scales etc.). As Desrosières stated "to quantify is to implement a convention and then to measure" (Desrosières 2008a, 10). Desrosières and Thévenot (2002, 35) studied different ways, how the reality of indicators and quantitative information, their socially perceived "ontology" is interpreted by different actors. The conventionalist's notion of "statistical chain" grasps the different steps in the production and circulation of statistical data. For Desrosières, it is statisticians, who know well about the foundational role of conventions, needed in the beginning of the statistical chain. Quantitative measurement, indicators and classifications need a starting definition to be implemented and they need related practices, how to identify values and categories in the process of measurement. Statisticians know that this start of the data production could have been chosen differently, other conventions as foundations would have been possible, too. And in the course of data circulation and publication, the way the character of these data is valued can change, because new actors address expectations in the ontology of these data. As, for example, in case of unemployment rates, the politicians, the public, and citizens expect numbers to represent a "realist" unemployment rate, a value of an indicator which represents a social reality, which exists independently of statisticians' decisions (with conventions of measure-

[4] The most important monographs are Boltanski and Thévenot, Storper, and Salais. See for an overview the contributions in Eymard-Duvernay (ed. 2006a, 2006b), in Favereau and Lazega (eds. 2002) and in Batifoulier et al. (eds. 2016). For an introduction see Diaz-Bone (2018).

[5] In this journal, a series of special issues collecting contributions of the approach of convention theory have been published; see Diaz-Bone and Salais (eds. 2011, 2012), Diaz-Bone et al. (eds. 2015), Diaz-Bone and Didier (eds. 2016).

ment to apply). The main problem of a statistical chain is the possibility of undermining its coherence. This happens – as sketched above – when the different steps of the chain are structured by ways of measuring, interpreting and using data, i.e., conventions which are contradictory. The problem is that the figures alone do not represent the involved conventions, which is the reason why incoherence is possible. Applied to the example of measuring unemployment incoherence is possible, when politicians argue that the unemployment rate represents at the end (of the chain) a pre-given fact, unaffected by conventions invested in the beginning (of the chain). This realist argument is misleading and interprets the figures in an invalid way. Convention theory has focused on different influences, which undermine the coherence of the statistical chain. Studies identified different mechanisms as different micro-politics of involved groups of agents (Thévenot 1981), as incoherent sets of quality criteria, where the incoherence is caused by tensions between underlying conventions (Desrosières 1995) or as developing systems of categories bringing in new employment categories in statistical chains, thereby disturbing established categories and established coherences (Salais et al. 1999).

Desrosières has characterized the transformation of the character of numerical information from its conventionalist beginnings to a realist representation of a "pre-given and foregoing reality", in which statisticians play different roles.

> In their everyday practice, statisticians are plunged into a world of conventions, which they record or shape themselves. The fact that the measurement results from this sequencing of conventional decisions is therefore self-evident to them. Later, however, they change hats without realizing it, and speak a realist language when addressing the outside world. (Desrosières 2009, 320)

Indicators are produced and distributed in statistical chains with a high degree of labor division.[6] From the perspective of convention theory there are different important questions. Is the statistical chain coherent and does it keep its integrity, which was initially implemented by bringing in a convention (or a constellation of conventions) as coordinating logic of the different steps of measurement? Does the generated numerical information finally support a collective intentionality to achieve a common goal and common good? Can the numerical representation be criticized and justified for its valid convention-based production and application? What is the spatial and temporal scope of the statistical chain? How is numerical representation integrated into more personal environments and regimes of engagement? What is the link between governance and statistics? These questions are applied as the analytical (and also critical) perspective, introduced by convention theory. EC's concept of convention can be regarded as an empirical normative foundation for indicators, because conventions represent a way of thinking what is correct and suitable. This norma-

[6] See for the concept of distributed cognition Hutchins (1995), who has been influential for EC (Diaz-Bone 2018).

tive foundation acts as frame in processes as operationalization ("defining" categories and variables), the measurement acts (e.g., handling of instruments), the interpretation and evaluation of numbers.[7] Data are always embedded in situations of coordination, interpretation and evaluation structured by conventions. These conventions work also as conventions of equivalence, enabling actors to generate comparable data (Desrosières 2005).[8] Therefore, the sole figure does not guarantee in itself a complete meaning. The perspective of a pluralist normative foundation of quantification and of the production as such characterizes EC as a pragmatist approach in two ways.

1) Conventions as foundations of indicators can be seen as an explicit or implicit element of wider and embedding social science theories or scientific world views. Conventions are the normative foundations for quantifications and conventions are orders of justification, which Boltanski and Thévenot (2006) emphasized, and these normative foundations (and orders of justification) offer a narrative semantic content, which contributes to an enhanced scope of the statistical chain (Diaz-Bone 2017).[9] EC avoids separating numbers from practical normativities and embedding situations, and also avoids a fact/value dichotomy as pragmatists like Dewey (1938) and Putnam (1992, 2002) do.
2) Because of the plurality of existing conventions, there are different possible ways, how to operationalize indicators, how to measure and how to interpret and evaluate data. All in all, the pragmatist perspective of EC differs from a positivist or Weberian position, which only accepts methodological standards as normative foundation, while pragmatism recognizes practical value systems and conventions as socio-cultural frames as being influential for quantification.

In recent years, conventionalists have addressed the impact of neoliberalism on quantification. First, Desrosières (2011b) sketched the transformation of statistics toward a dipositive for stimulating ("rational") economic behavior and the replacement of state administration by private agencies. Neoliberalism has been characterized as the intrusion of market principles into formerly non-economic social spheres. But seen from the sociology of privatization, neoliberalism can be characterized also as privatization of data production, including the privatization and invisibilization of the underlying conventions.[10]

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[7] For a classical formulation of this position see John Dewey (1938, especially chapter IX).

[8] See for commensuration of quantitative data also Dewey (1938, 202).

[9] It has been the neo-pragmatist Hilary Putnam, who worked out the interconnection of "facts" (numbers), theories, and values: "(1) Knowledge of facts presupposes knowledge of theories. (2) Knowledge of theories presupposes knowledge of facts. (3) Knowledge of facts presupposes knowledge of values. (4) Knowledge of values presupposes knowledge of facts." (Putnam 1992, 23)

[10] See for the argument in more detail Diaz-Bone (2016, 2017).

3. Power-Knowledge and Panopticism

One of the most influential social scientists since the middle of the 20th century is the French theorist Michel Foucault (Dreyfus and Rabinow 1982; Eribon 1991; Dosse 1998b, 1998c). His work on the historical reorganization of the institutional structure and the orders of knowledge in fields as health (Foucault 1973), madness (Foucault 2006) or the penal system (Foucault 1995) opened up a new perspective of agency and mechanisms of socio-historical institutional change. For Foucault, change is not driven by established explanatory principles such as technology, interests of social classes or the battle for resources. Instead, Foucault studies the mobilizations of institutional and discursive change in long-term processes, thereby outlining the constellation of new elements as dispositives, practices, strategies, discursive notions, and problematizations. Similar to new French social sciences, Foucault integrates a pragmatist approach to his analysis of socio-historical change centering processes instead of structures and substances.[11] Agency, therefore is conceived as distributed to different influential elements.[12] Here it is important to refer to Foucault's genuine concept of power and his analysis of the link between power and knowledge. Knowledge, bodies, institutions and power are not interpreted as given substances respectively structures but as simultaneously accumulated by and invested in processes. In his study of the prison, Foucault invents the notion of micro-physics of power, organized in relations of power and penetrating the social.

> Now, the study of this micro-physics presupposes that the power exercised on the body is conceived not as a property, but as a strategy, that its effects of domination are attributed not to 'appropriation', but to dispositions, manoeuvres, tactics, techniques, functionings; that one should decipher in it a network of relations, constantly in tension, in activity, rather than a privilege that one might possess; that one should take as its model a perpetual battle rather than a contract regulating a transaction or the conquest of a territory. In short, this power is exercised rather than possessed; it is not the 'privilege', acquired or preserved, of the dominant class, but the overall effect of its strategic positions – an effect that is manifested and sometimes extended by the position of those who are dominated. Furthermore, this power is not exercised simply as an obligation or a prohibition on those who 'do not have it'; it invests them, is transmitted by them and through them; it exerts pressure upon them, just as

[11] In this regard, Foucault's approach to historical social research is close to the methodologies of John Dewey and Arthur Bentley (1949) or Charles Tilly (2006, 2008).

[12] But in difference to pragmatic French sociology, Foucault's theory sticks to structuralist concepts as episteme, which is a deeper and unconscious pattern structuring discourses (Foucault 1989). One could conceive the concept of convention also as a structuralist one, but conventions are cognitive resources, which can be reflected on by competent actors (Boltanski and Thévenot 2006). See for comparison and perspectives of combination of EC and Foucault's concept Diaz-Bone 2019.

> they themselves, in their struggle against it, resist the grip it has on them. This means that these relations go right down into the depths of society, that they are not localized in the relations between the state and its citizens or on the frontier between classes and that they do not merely reproduce, at the level of individuals, bodies, gestures and behaviour, the general form of the law or government; […]. (Foucault 1995, 26-27)

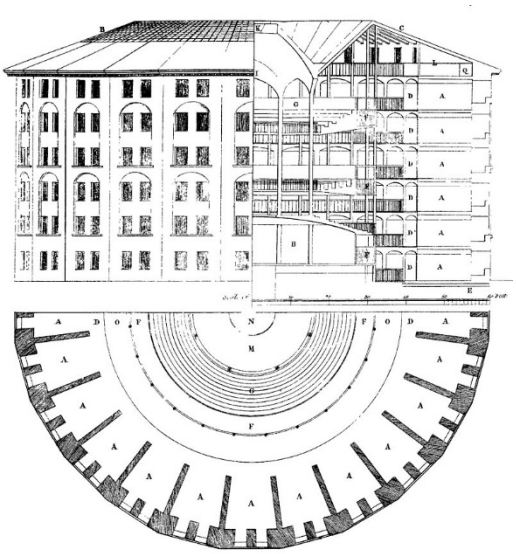
Power cannot be localized in state institutions or positions of social leadership. Foucault emphasizes the generating and productive effects, which are induced by power and in power relations. This opens up a new frame for the analysis of knowledge, which is not seen as the negation of power or regarded only as starting point to exert or to multiply power, but which is also generated by power and emerges out of power relations.

> […] we should abandon a whole tradition that allows us to imagine that knowledge can exist only where the power relations are suspended and that knowledge can develop only outside its injunctions, its demands and its interests. Perhaps, we should abandon the belief that power makes mad and that, by the same token, the renunciation of power is one of the conditions of knowledge. We should admit rather that power produces knowledge (and not simply by encouraging it because it serves power or by applying it because it is useful); that power and knowledge directly imply one another; that there is neither any power relation without the correlative constitution of a field of knowledge, nor any knowledge that does not presuppose and constitute at the same time power relations. These 'power-knowledge relations' are to be analysed, therefore, not on the basis of a subject of knowledge who is or is not free in relation to the power system, but, on the contrary, a subject who knows the objects to be known and the modalities of knowledge to be regarded as so many effects of these fundamental implications of power-knowledge and their historical transformations. In short, it is not the activity of the subject of knowledge that produces a corpus of knowledge, useful or resistant to power, but power-knowledge, the processes and struggles that traverse it and of which it is made up, that determines the forms and possible domains of knowledge. (Foucault 1995, 27-28)

In EC, power has long been an underdeveloped notion. Only recently, conventionalists have worked out a conventionalist perspective on power (Thévenot 2016b) or have applied Foucaultian concepts, which are closely linked to Foucault's concept of power as Favereau's reference to the Foucaultian concept of dispositive (Favereau 2014).

An architectural principle, which aims to multiply discipline and power effects, was developed by the British philosopher Jeremy Bentham. Bentham designed a building as a rotunda. Bentham aimed for architecture efficient to survey workers in a fabric or prisoners in a prison. In the center, Bentham placed the position of an individual in task of control and surveying, as an officer. This architectural principle is called "panopticon". At the end of the 18th century, Bentham (1791) presented his consideration to effectuate the surveillance of workers or prisoners and he also sketched the architecture of such a building (see Picture 1).

Picture 1: Panopticon (Jeremy Bentham 1791)



In the architecture of prisons, a tower in the center made a permanent and effective surveillance of the prisoners possible. Foucault's famous study about the development of the modern prison identified the circular architecture of the prison building with a surveying tower in its center as a paradigm for the organization of power in modern societies. This architectural principle is generalizable to organizations in others spheres of society by Foucault, such as factories or schools. He introduces the notion of "disciplines" as methods to exert power on the subject's body.[13]

> Panopticism is the general principle of a new 'political anatomy' whose object and end are not the relations of sovereignty but the relations of discipline. The celebrated, transparent, circular cage, with its high tower, powerful and knowing, may have been for Bentham a project of a perfect disciplinary institution; but he also set out to show how one may 'unlock' the disciplines and get them to function in a diffused, multiple, polyvalent way throughout the whole social body. These disciplines, which the classical age had elaborated in specific, relatively enclosed places – barracks, schools, workshops – and whose total implementation had been imagined only at the limited and temporary scale of a plague-stricken town, Bentham dreamt of transforming into a network of mechanisms that would be everywhere and always alert, running through society without interruption in space or in time. The panoptic arrangement pro-

[13] "These methods, which made possible the meticulous control of the operations of the body, which assured the constant subjection of its forces and imposed upon them a relation of docility-utility, might be called 'disciplines'." (Foucault 1995, 137)

> vides the formula for this generalization. It programs, at the level of an elementary and easily transferable mechanism, the basic functioning of a society penetrated through and through with disciplinary mechanisms. (Foucault 1995, 208-209)

Although Foucault was interested in the disciplining mechanism as well as in the social processes of forming modern individual subjects, this concept is also closely linked to knowledge and knowledge production. Visibility of individuals' behavior is therefore one core element of panopticism. For the argument developed here, it is important to recognize that visibility is an asymmetric property. It comprises prisoners and workers, who are visible for the person watching them but not vice versa. The inside of the tower in many of the prisons, built after the panoptic principle, normally cannot be seen by the surveilled individuals. These individuals shall develop knowledge of being permanently surveilled. The panoptic architecture itself becomes the dispositive of surveillance; it is not a single individual which is important as observer. The consequence of this asymmetric situation is that the tower could be empty and unmanned.

Linking the introduced notion of power-knowledge to panopticism, opens the possibility to think of knowledge-production based on practices and panoptical dispositives. Power-Knowledge is generated for purposes and as result of the implementation and proceeding of panoptical dispositives. In fact, there are only a handful of buildings, which are perfect realizations of Bentham's panopticon. The architecture of panopticism, as sketched by Bentham, is a more general principle and nowadays it is extended by technologies as video surveillance and computer-based forms of surveillance. Here, the asymmetry of being tracked but not being able to recognize who is observing and what is done with the collected data is enforced by technology. The new quality, which multiplies the power-knowledge effect, is one of the features of technological centralization, storage and analysis of data.

4. Statistical Panopticism

Extending Foucault's concept of panopticism, one can introduce the concept of statistical panopticism.[14] There are some differences between these two concepts.

[14] This concept has many aspects in common with Zuboff's concepts as "information panopticism" (Zuboff 1988) or "surveillance capitalism" (Zuboff 2015). The main difference should be seen in the conceptual integration with EC which brings in a substantial theoretical approach for measuring and value, which is missing in Zuboff's approach. In difference to "information panopticism" the notion of "statistical panopticism" also emphasizes EC's interest in the analysis of economic coordination and valuation. See for an overview of sociological

(1) In contrast to the Foucaultian notion of panopticism (in which numerical information is only one form of cognitive representation), statistical panopticism as dispositive is based essentially on *numerical information* and especially on the new digital technologies and the growing pervasiveness of these technologies, which produce numerical data on individuals (their behavior, performance, their rankings etc.). An exemplary field in which cognition, knowledge, and information are transformed numerical data is health, one of the most rapid changing and commercializing fields. The reason for the speed and impact of this transformation (not only in the example of health) is the preparation of social spheres, which where reorganized by standardization, metrics and economization (which has brought in prices as another numerical standard).

(2) Also numerical information is more and more essential as *societal and private representation* of "knowledge", "facts", "trends", "evidences", "proofs", "values" etc. Foucault developed his concept while focusing on the organization as unit as the prison (as well as viewing on other organizations as fabrics or schools, see Foucault 1995). It is important to *transgress this unit of the organization* and to include individuals' situations, "private environments", as well as the situation of the society as a whole (or even globalized situations).[15] The neoliberal life-world has been transformed into a more and more numerically organized sphere, in which for individuals the frontier between private and public life more and more dissolves.[16] The reason is not only because individuals bring in their private life into the electronic, but vice versa, the workplace, private situations, and the public, as perceived by individuals, are more and more cognitively organized as numerical information. For example, individual's knowledge about health is represented by health apps and many individuals nowadays orient themselves towards benchmarks implemented in health apps and communicated by mass media as numerical information. Many individuals have begun to feel as active subjects by reorienting their eating and sport behavior in accordance to these new devices. From a convention theory's perspective and also from a Foucaultian perspective, these devices, benchmarks, and mobilized practices also mobilize a specific concept of what "health" is. From EC's perspective, it is evident that the *statistical chains involved apply different conceptions* of what is to be measured (and why medics have other concepts and strategies to calculate as ordinary insurants), which is the reason why health data co-produced by developers of apps in health

receptions of panopticism and the discussion of post-panopticism the contributions in Brunon-Ernst (ed., 2016), Boyne (2000), and Gane (2012).

[15] This is one critique of Foucault's notion of panopticism (Brivot and Gendron 2011).

[16] From a conventionalist perspective different logics of coordination, which convention theory has identified (Boltanski and Thévenot 2006), are *combined* with these new strategies of quantification. As one can see in the case of Airbnb, the combination of the domestic convention and the industrial convention is enabled by establishing booking services for apartments as an Internet business, quantifying and "datafying" personal relationships.

insurance companies, self-quantifying individuals, and interpreting medical data will presumably result in invalid data not suited to realize common goods (as the improvement of public health).

(3) In difference to Foucault's description of panopticism as a strategy to discipline modern subjects in a more direct form (by disciplinary action as in prisons, the "disciplines" see above), statistical panopticism should be conceived as a dispositive, which exerts power effects in an *indirect form*, implementing statistical criteria of valuation and evaluation, generating quantified forms of knowledge in personal and social representations, present in situations of actors, in which individuals try to become subjects by fitting to these representations, i.e., by conforming to numerical values, improving scores, achieving ranks etc. As Foucault has argued in his lectures on governmentality, neoliberalism can be described as the implementation of situations, which are coined by competition and market-like conditions of evaluation and valuation, in which subjects become "entrepreneurs of themselves" (Foucault 2008; Gane 2012; Laval 2018). Neoliberal governance is exerted by controlling the relevant aspects of competition and numerical information, which represent market-like (cognitive) structures. In regard to health, individuals' behavior is influenced not only by public debate about public health issues and individuals' health issues, but also by incenting individuals to apply health apps and to get reduced health insurance tariffs for this (as it is the case in Switzerland). The private situations of individuals are influenced by strategies of health insurance companies, but also employers try to influence the health orientation of their employees nowadays by offering sport activities funded by the enterprise and by offering incentives for participation. These strategies generate data for the companies and insert elements of market-orientation by the insured person's resp. by the employees, who realize possible negative consequences in case of not participating.

(4) By speaking of statistical panopticism it is important to highlight its specific character which results in the generation and accumulation of huge masses of data as well as its *centralization and marketization*. Surveying social processes by new informational technologies (as smart phones, computers) and behavior tracking sensors (in industrial machines, personal devices as smart phones but also in domestic devices at home) which are linked to the Internet, continuously generate huge masses of data. In first instance it is private enterprises as insurances, producers of consumer goods, advertising companies, financial analysists, energy providers, Internet companies and e-commerce enterprises, communication and transport services, which collect data. The Internet could have been seen once as a chance to democratize markets and the public sphere, because of its open network structure. But some Internet companies (as Google, Amazon, Facebook, Alibaba, Airbnb, Uber etc.) have achieved quasi-monopolistic positions and centralized the evaluation of actors. The way they calculate these evaluations is part of their business model and will not be

made public. These companies advance the centralization of data processing, thereby possibly misusing their quasi-monopolistic position (as Google's search engines have for information retrieval, which is biased for commercial reason by Google). For some decades now, enterprises started to analyze these data to identify patterns and information, which could be exploited for commercial purposes. Nowadays, companies specialize in the collecting, matching, analyzing, and trading of huge data sets as service for other companies. Today, there are almost no parts of everyday life, in which individuals do not leave digital traces. The announcement of these data traders and data analysists is to offer a fine-grained profile of individuals, to score their purchasing power, creditworthiness, health status, consuming preferences etc. To pick up the health example, it is interesting for health insurance companies to buy data sets offered on the market for data. Data generated by supermarket chains, travel agencies about consuming behavior or geo-data generated by telephone companies or car producers can be statistically linked to "big data" and produce a more complete and fine grained analysis of the insured person. Afterwards, scores (for risks or tariffs) can be recalculated, incentives adjusted etc. Fourcade and Healy 2017 [2013] have demonstrated that this concentration of data and the applied classification practices exert power and cause new inequalities not only in insurance tariffs but also in life chances (when medical treatment is given or denied on the basis of big data analysis and profiling of individuals behavior).

(5) To realize the structuring power, statistical panopticism also has to implement the *asymmetry in communication and power*, which means that actors have to admit quantifying dispositives (apps, rankings, indicators, etc.), to recognize scores as norms and values, and to *accept them as dispositives* without questioning them (Beer 2016) and without questioning (or identifying) their basic conventions.[17] The indicators proceeded by statistical panopticism as dispositives could be without substantial conventions, they could originally be implemented "ad hoc" (as by fiat-decisions of politicians) and without being part of coherent statistical chains. Here, a center of statistical panopticism (which in the panoptic architecture is the tower) can be "empty", without any substantial foundation as the tower could be unmanned and empty in the panoptic architecture of a prison or a factory. Therefore, centralization as aspect of statistical panopticism does not refer to a single person, party, social class or organization, which resides in the center.[18] Statistical panopticism is asymmet-

[17] Berns argues that statistics can exert directly and immediately influence on the moral of social collectives (Berns 2009, 81).

[18] This is one reason, why the concept of statistical panopticism is different from George Orwell's "1984" dystopia (Orwell 1949). Also, statistical panopticism as portrait here for western societies, is not driven by a single totalitarian state and not based on a totalitarian ideology. This is the difference to the social credit point system in China, which could become such an Orwellian dystopia (Botsman 2017).

ric as a one way mirror, because the "quantified individuals" and the actors underlying the influence of statistical panopticism can only see their own numerical representations but not the "other side" of quantifying practices, which is the quantifying agency generating these numerical representations. In Foucault's analysis of panopticism, the disciplinary effect raised because individuals knew that they were observed in the panoptic architecture of the prison, but also in institutions as the factory, the school, etc. Nowadays, it could be argued that individuals do not (at least not completely) perceive surveillance by the Internet and computer-based processes of data production, analysis and by the feedback, in which the numerical representations in individuals' situations are computed. The asymmetry could become (mostly) unconscious and one could argue that the disciplining effect should vanish.

> In the panopticon the occupants are constantly aware of the threat of being watched – this is the whole point – but state surveillance on the internet is invisible; there is no looming tower, no dead-eye lens staring at you every time you enter a URL. (McMullan 2015)

Individuals as insurants could know well that data is gathered about their health condition, beginning with a questionnaire when entering the contract relation. Also medical examinations and counselling, clinical report after operations etc. should be known to be gathered by health insurance companies. But normally individuals do not know about the active big data analytics as described above. This analytical practice is mostly invisible to insured persons and usually not known by them.

(6) For years now, mass media have reported about the tracking of behavior, about new technologies of surveillance, about computer software, cookies, and apps secretly collecting data. Paradoxically, public awareness on this panoptic situation came up by public critique, criticizing the disregard of individuals' rights of privacy and individuals' control of personal data. Today, individuals could know because of their different roles, e.g., as consumer, insurant, credit user, internet user, tax payer, account owner, car driver, smart phone user that their activities are tracked and the data traces they generate are collected and analyzed. Companies started to implement incentives and rewards for individuals, which are based on their behavior and the collection of data, a practice, which individuals now realize and admit. To continue the reference to the health example, health insurances offer reduced tariffs for insurants, who offer additional personal data via apps and who actively adopt their way of living to criteria defined by the health insurance. As a consequence, individuals step by step begin to *conform to recognized evaluation criteria* and to perform their live in accordance with the way, they hope appropriate for being valued and evaluated in a better way by these organizations and to receive better contract conditions or incentives. As a new phenomenon, there is an *upcoming culture of numbers* delivered to private companies as a result of self-quantifying by apps and the awareness of indicators which are related to individual behavior as

"performance indicators", as numbers of visitors on social media sites, number of followers and so on. For scientists, nowadays, indicators as the h-index or Google scholar scores are established as criteria for recognition and evaluation in the scientific community. Espeland and Sauder (2016) recently argued that this form of conforming to numbers in science, can also be observed on the level of scientific departments and universities (the focus of Espeland and Sauder is the US NEWS ranking of law schools), which are reorganized due to the rankings of their internal professional structure, their power relations, career opportunities and so on. For the national level another important example is this: For some years now, the People's Republic of China has been implementing a national scoring system, to evaluate the conformity of its citizens' behavior. The Chinese social credit system combines big data with big data analytics, now driven by the Chinese state.[19] What is astonishing here is that the Chinese state administration aims to make the scores of individuals (and other legal entities as enterprises) public information from the year 2020 on as scores of "trustworthiness" (Economist 2016; Botsman 2017).

5. The Deficiencies of Social Critique

The mechanism of panopticism, described by Foucault, unfolds by the way actors conform to these developments and change their behavior according to these indicators, which are related to individual behavior and performance. This way, statistical panopticism establishes itself as a form of neoliberal governance. Here, indicators exert governance, without political deliberation of the principles (i.e., conventions), indicators (as well as their representation, application and publication) are built on. From a pragmatist perspective, it is evident that actors reflect their situation in times of digitalization and the Internet. They have a good sense of the real agency, which does not influence single individuals but algorithms and their outputs, which are figures. The "panoptical moment" rises, when actors realize this condition as important of their situation: a digital life world, offering more and more indicators on individual performance (Beer 2016). For individuals, the (scientific) validity of these indicators does not (!) matter first. What matters is the perceived impression that individuals will be rewarded or sanctioned by these indicators and that other individuals as well as the public will care also about these figures.

[19] In Germany, one of the first state-driven forms of big data analysis was the computer-based dragnet investigation ("Rasterfahndung"), which was applied by the Federal Criminal Police Office ("Bundeskriminalamt") to find the members of the West German terrorist group RAF in the 1970s. Therefore, different and huge data bases were compiled to detect suspect patterns of civilian behavior (Bergien 2017).

The paradox of statistical panopticism as a form of political governance is that its inner core, the collective foundation of indicators on conventions, which support the collective achievement of a common good, is empty. The argument here is that statistical panopticism is characterized by its inner void, which centralizes power effects and knowledge, thereby avoiding participation and deliberation. This makes statistical panopticism a neoliberal governance structure.[20] Conformity, discipline, and competition between individuals is implemented by generating numerical benchmarks (scores, ratings, rankings, etc.), without offering to collectives and to the public insight, transparency, intelligibility and this way a full understanding of what figures represent. Thomas Berns (2009) has interpreted this situation as "governing without governing" (*gouverner sans gouverner*). The neoliberal governance aims for private profits not for common goods. Statistical panopticism is part not only of centralization and invisibilization of data generation conventions, but also part of strategies of extending the influence of private agencies (privatization). Christian Laval (2018) has systematically presented Foucault's contribution to the analysis of neoliberalism. For Foucault, the neoliberal form of governance is characterized by implementing market-like conditions in situations actors have to adapt to. More and more situations are characterized by competition as social logic of behavior. Power is exerted in an indirect way, by structuring situations in which actors behave accordingly, instead of disciplining actors directly. Power in statistical panopticism loses its character of directly accessing individual bodies and behavior. Instead (1) actors are equipped with the idea of being subjects who maximize their own utility in terms of labor market value and (2) actors' environments are transformed to market-like situations in which individuals act as self-entrepreneur (*entrepreneurs de lui-même*). Markets become the normative "milieu" for subjects. Neoliberal power is exerted by the coordinated influence on actor's orientation and on situations (Laval 2018, chap. 3; Foucault 2008). Quantification plays a fundamental role for this power effect by simultaneously penetrating situations with numerical representations and structuring actors' cognition and orientation to impose competition and self-control. Statistical panopticism emerges as the new condition of living also from the viewpoint of ordinary actors. But, even if actors experience self-quantification as a form of self-control, this neoliberal form of governance should be interpreted as *self-control without control* (echoing Thomas Berns) and as *governing situations by numbers* (echoing Alain Desrosières), structuring representations, and cognitive structures. This is the neoliberal articulation of Foucault's notion of power-knowledge. As a neoliberal form of governance, statistical panopticism can avoid legitimation and critique by avoiding transparency of its power-knowledge effects. It is this camouflage or the lack of

[20] See for a discussion of panopticism as a dispositive of (neo)liberal governance Gane (2012).

publicly visible, criticizable, and justifiable conventions (in this sense: its void – comparable to the unmanned tower in Foucault's concept of panopticism), which characterizes statistical panopticism from EC's perspective.

Critics of big data analytics have argued that predictions on the bases of "big data analytics" cannot claim to be a valid assessment (O'Neil 2016). In the case of predictive recidivism, it has been empirically shown that the software, used by judges to evaluate the risk of recidivism, was not able to deliver predictions, which performed better than the estimates given by laymen (Dressel and Farid 2018). Big data-based predictions or indicators, applied to self-quantification, are not questioned by everyday actors, who use them. The results create influential social facts, although they cannot be regarded as valid measurements per se. To variegate the classic Thomas-theorem, one could state that indicators have real consequences, when individuals take them for real, which is pragmatically to take them as relevant cognitive reference points.[21]

Contemporary societal and individual representation is more and more pervaded by statistical information which actors, organizations, nations rely on (Zuboff 1988; Beer 2016). As mentioned, the demand for quantifying more parts of social spheres and social behavior is increasing, while skepticism against quantification is rising also (Desrosières 2015). Criticism has developed two main strategies, which both seem to be deficient. (1) One form of critique against quantifying and the power-knowledge effects of statistical panopticism at all is to argue that numbers, figures and statistics are invalid formats of knowledge and evaluation. This strategy of criticism fails to develop institutional and societal power because it does not offer an alternative to modern needs of far-ranging forms of knowledge, formats enhancing comparisons, descriptions and communications of huge amounts of individuals, goods, decisions, and so on. This is the reason why quantification is the most powerful cognitive format in modern times (Porter 1995; Beer 2016). The strategy which is applied here is to resist quantification, not to take part in surveys, not to leave data traces in the Internet, etc.[22] This way actors try to become "invisible" for tracing and surveilling technologies, in short, actors try to symmetrize the asymmetry of panopticism enforcing invisibility on both sides.[23] The perfidy of statistical panopticism is to offer individuals the illusion of self-deciding about their data production. (2) The other strategy is to criticize statistical panopticism for not conforming to the expectation that indicators have to have a sub-

[21] The original Thomas theorem stated "If men define situations as real, they are real in their consequences" (Thomas and Thomas 1921, 571-2).

[22] Desrosières (2015) has named this kind of resistance, arguing against the power effects of social research and national statistics also "retroaction". See also Foucault's notion of critique, familiar to Desrosières' concept of retroaction, which is based on a concept of resistance (Foucault 2007b).

[23] This strategy is known to economic sociologists, because it is important for informal economies as described by Porter and Haller (2005).

stantial definition as a basis, i.e., indicators have to be grounded on conventions, which were deliberated by experts and can be justified in the (scientific) public. From a conventionalist perspective, this critique is based on the industrial convention and the civic convention, which assume an inner rationality of indicators that can be criticized by experts and citizens and which can be justified publicly also. But, if the center of statistical panopticism is a void, then critique will fail, because there is no publicly visible and/or foundational convention residing to be addressed. The critique will find no target. Statistical panopticism does not correspond to the logic of industrial coordination and civic coordination, because it does not pursue a common good. Correspondingly, it does not aim for scientific purposes or standards but for private purposes. Therefore, one could argue that statistical panopticism is close to the domestic convention.[24] But for EC the domestic convention has a semantic core, an inherent narration which grounds quality and justice. All in all, this second strategy of criticism fails because it addresses its critique to the level of conventions, which can be criticized and justified publicly, as Boltanski and Thévenot (2006) have argued for conventions as the industrial, the civil or the domestic convention. These conventions do govern statistical chains of national statistical institutes or social research organizations, but not the areas of data production and distribution, which are run by private companies.

From the perspective of EC, these data (as formats, data as knowledge and dispositives), generated and analyzed by private companies can be conceptually linked to *regimes of engagement* below the level of critique and justification. Laurent Thévenot (2014) has identified these *regimes of engagement* as the "engagement in a plan", the "engagement in familiarity" and the "engagement in exploration". The concept of regimes of engagement much better grasps the power-knowledge effects, which are mobilized by statistical panopticism. Individuals become subjects in the Foucaultian meaning of the term, by structuring their everyday life, their privacy (social network, leisure activities), and their working environment by numerical representations which are offered by quantifying devices and other services of private companies (see above). Thévenot's regimes of engagement emphasize actors' capacities to cope with a personal environment equipped with objects and cognitive forms. Thévenot focuses on agency, not on dominance. In fact, the strategy applied by many individuals here is to dismiss collective critique, to adapt to the situation of quantified lifeworlds and to regard the new quantifying technical devices and data as tools to manage their personal environment in a more sovereign, i.e., in a data-based and this way by a (presumably) "scientifically informed" mode of realizing individual goals (personal fitness) or common goods (reducing health care costs) by individual engagement. It is Foucault, who interpreted the two sides

[24] In fact, some arguments of Thomas Berns link governance based on numbers (statistics) to the domestic style of governance (see for example Berns 2009, 12).

of individuals' agency as a capacity for self-governance (Foucault 1988). The perfidy of statistical panopticism is to offer individuals the illusion of self-controlling their personal environment. In fact, the data generated are based on opaque procedures, defined ad hoc (without conventions) or possibly on conventions (definitions), which are not transparent to the users in their personal environments. The illusion of self-control is mobilized, when users add meaning to and interact with these data by "improving" them (e.g., trying to reduce cholesterol levels, raise numbers of steps per day etc.) without knowing how these indicators are measured by technical devices and – more important – without knowing if these criteria are validly related to personal goals (as personal health) or collective goals (as growth of welfare) at all. Power is exerted in different steps: (1) (cognitively) structuring situations by numerical data,[25] (2) making actors recognize and accept data as meaningful and valid representations and (3) influencing actors' behavior by incenting actors to "improve" data. As Laval (2018) has shown, this is the Foucaultian (and more indirect) power effect in neoliberal societies and their situations, when competition is implemented in situations by individual self-management based on quantitative information.

6. The Coming Crisis of Scientific Knowledge or Bringing Social Sciences Back In?

Nowadays, the politics of indicators, the intransparency of indicators, indicator-based political governance and power are criticized by many social scientists and sociological approaches as EC. Today, statistical panopticism is mainly discussed under the heading of "big data" and their problems. Big data processes nowadays are based on distributed technologies and distributed as well as presumably incoherent algorithms (Dourish 2016). In addition, many mediating technologies are involved, undermining the coherence of statistical chains also. Incoherence along the statistical chain invalidates the meaning of data and undermines the validity of indicators, constructed to achieve a common good. Coherent and visible statistical chains should be expected to unfold powerful forms of data generation when perceived as valid (legitimate). In this case the statistical chain will be recognized, inspected and deliberated as a whole. Its legitimacy can only be questioned in public be questioning the whole chain.

But statistical chains can exert power even if they are burdened by incoherence and are opaque to actors. This power is then not exerted on the basis of valid data or their valid interpretation, but in this case on the basis of misrecog-

[25] Here, EC's concept of "investment in form" is an example for this structuring effect (Boltanski and Thévenot 2006; Diaz-Bone 2018).

nition and misinterpretation of data, in this case the statistical chain will be recognized and deliberated only by its parts. Power effects, here, can hardly be efficiently criticized, because of this opacity of the incoherence of the whole chain. The privatization and invisibility of conventions along the statistical chain, the opacity of some of its elements and the illegitimate power effects based on this are EC's critical perspective on big data (Diaz-Bone 2016). Roger Burrows and Mike Savage have argued that there is a coming crisis of traditional research methods of social sciences, because they are not designed to cope with the new type of data, represented by big data (Savage and Burrows 2007; Burrows and Savage 2014).[26] However, the more important problem, which Desrosières (2011b) already indicated, is to have private agencies, international NGOs and enterprises as institutions, which generate and analyze big data but also implement their own indicators for objects as counselling, reporting, evaluation and valuation. Indicators are step by step privatized as the power-knowledge production is.[27] The coming crisis is not a crisis of methods first and foremost, it could be a crisis of social sciences and their position in society in total, supplanting public (funded) institutions devoted to aim for common welfare and common goods.

The real challenge for social sciences nowadays is to cope with privately generated quantifications as business knowledge as an upcoming rival, competing with traditional science (and its institutions) for the definition not only of assets, but also social facts, public problems, and policies, and as bases for governance. The developments and the statistical panopticism sketched in this contribution should not result in a fundamental skepticism about quantification and indicators. Without numbers and quantification no modern society, economy or organization would be possible. Instead, agreements and institutional cooperation between social research infrastructures (as GESIS in Germany, FORS in Switzerland), national state institutions, international agencies, NGOs and global operating enterprises will be needed to occupy the void of statistical panopticism and to transform its empty center to a democratic dispositive aiming for common goods and public interests. A first step for this could be the implementation of an institutional structure for the deliberation of conventions indicators are based on, between scientists, public actors and other stakeholders, and a pragmatist monitoring of public policies, based on indicators, making indicators and indicator-based policies an experimental public domain aiming for societal amelioration and advancement – as it was sketched already by the

[26] Also, social scientists teaching and researching in institutions as universities won't have access to many data bases. The exception is the analysis of publicly accessible Internet data via scraping technics (see Foster et al. 2017). Most big data are produced by the privately owned technologies and technical infrastructures of enterprises – inaccessible for "ordinary" social science research.

[27] This trend is in line with the privatization of science itself as well as the privatization of its results, contributions (as patents) in the era of neoliberalism (Mirowski 2011).

classical pragmatist John Dewey (1938) or as it is nowadays proposed by the economist Amartya Sen (Salais 2016).

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