

BIO-OBJECTIFICATION AND BIOBANKS

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Bio-objectification is presented in this paper along with a discussion about the boundaries of life in the biomedicalization paradigm, including the biobanking processes that are crucial to the emergence of bio-objects. Regarding methods and materials, STS methodology is implemented and the actor networks that play a significant role to bio-objectification are investigated. The discussion follows through these lens on how bio-objects are co-produced through a multitude of sociotechnical factors, reflecting on how the emergence of bio-objects and the concept of life that stems from them are socially constructed. The standardization of biobanks, population construction through a co-production of technosocial factors, the momentariness of bio-objectification, and the concept of bio-identification are presented and critically reflected upon. The main purpose is to combine a philosophical perspective with an STS one regarding the issue of shifting the boundaries of life through the concept of bio-objectification.

Keywords: bio-objectification, STS (science and technology studies), biobanking, co-production, bio-objects

Introduction

This paper critically reflects on how bio-objectification occurs through processes within the structure of biobanks. Initially, an attempt to define bio-objectification is presented along with a discussion about the boundaries of life in the biomedicalization paradigm. An analysis of the biobanking processes, which are crucial to the emergence of bio-objects, follows. Using STS methodology, this project explores the actor networks that play a significant role to bio-objectification. It also focuses on how bio-objects are co-produced through a multitude of sociotechnical factors. In the same vein, it reflects on how the emergence of bio-objects and the concept of life that stems from them are socially constructed.

Some key issues related to bio-objectification and how it is manifested through biobanking processes will be presented. These include the standardization of biobanks, population construction through a co-production of technosocial factors, the momentariness of bio-objectification and the concept of bio-identification. The purpose of this study is to combine a philosophical perspective with an STS one regarding the issue of shifting the boundaries of life through the concept of bio-objectification. Given the limits of this exercise one can only expect to scratch the surface of this issue. However, it is important to present the framework within which concepts such as bio-objects and bio-objectification can challenge in concrete to our conceptualization of life.

Materials and methods

Bio-objectification and the concept of life: shifting boundaries

Within the biomedicalization paradigm, bio-objectification procedures are of interest as they can provide a reconceptualization of "life". A brief analysis of these procedures from an STS perspective will be presented here. At the same time, we attempt to provide an overview of the philosophical implications for the definition of "life" as a concept. A definition of bio-objects is suggested by Webster, who argues that a bio-object is "a useful conceptual device or heuristic to refer to socio-technical phenomena where we see a new mixture

of relations to life or to which 'life' is attributed" (Webster, 2012). Bio-objectification refers to the "process" through which "different life forms are created and are given life, and perhaps, multiple lives" (Webster, 2012).

To begin with, considering bio-objectification as a process through which a bio-object is constructed, it is crucial to analyze the creation of bio-value insofar as it shapes our understanding of the concept of "life". More specifically, in discussing bio-objects within the biomedicalization paradigm, life becomes the object of research. Undoubtedly, there are significant peculiarities related to this research "object". As Canguilhem pointed out, life demonstrates a *sui generis* specificity, which makes it notoriously difficult to categorize and put within concrete boundaries. His special kind of vitalism focuses on how the organism, or for our purposes living matter, expresses itself always in relation to its milieu (Canguilhem, 2008). What distinguishes living from non-living matter is a vitality that makes the former dynamic. Even within this simply described theoretical framework, one can understand why bio-objects are notoriously difficult to categorize and should be viewed as dynamic, evolving entities.

Before moving to the social co-construction of bio-objects, one more point should be considered, which is closely related to the above. Pickering talks about an "unstable ontology" when he refers to bio-objects (Webster, 2012). To reach this assertion, he supposes that materiality has agency or, in other words, it demonstrates performativity. Given the above statement about how life expresses itself, one can make the connection with the concept of performativity. Living materiality gains its ontological status through its "actions", though its performance as such (see: Lennon, 2019). Although the concepts of agency and performativity are closely linked with intentionality and teleological concepts still pervasive in biology (see: Allen and Neal, 2020), the limited space of this exercise prevents us from proceeding further in this vein. Also, ascribing agency to any type of matter is a rather dubious and expansive concept. For all intents and purposes, we accept the ascription of agency and performativity to living matter. In this case, the "unstable ontology" of bio-objects refers to a conception of their ontological status as fluid and dynamic. This is a very important point for our discussion of bio-objects. However, in my view it is not about an "unstable" ontology. It would be better to talk about a dynamic ontology with an object,

life, which is not actually unstable but ever challenging the boundaries we ascribe to it.

After this brief discussion of the theoretical framework related to the concepts of “life” and “bio-object”, we turn to a sociotechnical analysis of how bio-objectification as a multifaceted procedure leads to the construction of bio-objects. Up to now, the vitality of life manifesting through bio-objects was presented. Now, we will explore how bio-objectification reshapes the concept of life. Our point of focus is bio-objectification through biobanks, as we attempt to map the processes through which bio-objects are co-produced (Stephens et al., 2018).

Bio-objectification through biobanking

In this section we explore the biobanking processes that shape bio-objectification, constituting and assigning value to bio-objects. We will focus on some major issues regarding the interplay of biobanking and bio-objectification. More specifically, these include standardization, the construction of population, i.e. the bio-objectification of populations through biobanking, the momentariness of bio-objectification and the concept of bio-identification. From a sociotechnical perspective, all of the above involve multiple actors and are co-produced at the junction of biological, social, technoscientific, political, economic and institutional regimes.

To begin with standardization in biobanks, we draw from Tamminen’s article on EU’s policy concerning the creation of the Pan-European collaborative initiative called “Biobanking and Biomolecular Resources Research Infrastructure” (BBMRI) and the “Minimum Information About Biobank Data Sharing” or MIABIS information model that stems from it (Tamminen, 2015). In the digital era, the biomedicalization paradigm shifts towards bioinformatics. In order to become “big-science”, biology needs to utilize the large databases which can be digitally accessible on a global scale (Tamminen, 2015). The implications of this tendency for biobanking and bio-objectification are quite evident. Biobanks aim to break national boundaries and the bio-objects created get to be viewed as supranational entities. Undoubtedly, this process expands bio-objectification to unprecedented levels and apart from challenging the boundaries of “life”, it also brings forward new sociotechnical, legal, and ethical issues, which call for a reshaping of current governance regimes. Additionally, this tendency to internationally standardize biobanking processes is by no means neutral. Political, cultural, social, and institutional issues are embedded into it (Tamminen, 2015). Given that it is not possible to open the blackbox of biobanking standardization here, we just point to how, in the bioinformatics era, a global population is being bio-objectified. Additionally, Brown & Williams explored the concept of immunity in relation to bio-objects such as cord-blood transcended communities, leading to a new conceptualization of bio-objects (Brown and Williams, 2015). In this case, bio-objectification is co-produced through standardization procedures resulting in the creation of bio-objects, such as the products of cord blood or digital artifacts and data, using technoscience to transcend geographical frontiers. The actors involved include a global biobanking network, sociotechnical, and political key players.

Discussion

Is the framework presented above enough to explain how populations are constructed in biobanks? What we call “bio-objectifying the population” here, refers to “the construction of populations, whereby specific nationalities, communities, societies, patient groups, and political systems become imbued or bio-objectified with particular characteristics, such as compliant, distant,

positive, commercialized or authoritarian” (Tupasela et al., 2015). This process of co-construction of identity is reciprocal. On one hand, biobanks construct populations and on the other they are shaped by the populations they use as their database. This can also be understood as a form of bio-objectification whereby the very governance of biobanks leads to “popular conceptualizations of the population they draw their material from” (Tupasela et al., 2015). Bio-objectification can be seen as “an iterative process between historical, political and scientific activities where these different spheres interact with each other in different configurations” (Tupasela et al., 2015). The study of three different biobanks, in Canada, Spain, and Finland, is indicative of how biobanks bio-objectify the population. Briefly, in Canada the national structure of biobanks that aimed towards the common good shifted towards a more individualistic and international perspective. The direct engagement of the public co-produced this shift, from an initially depicted as content public to a more and more discontent one regarding biobanking processes. In Spain, data was mostly gathered through intermediaries, such as clinics, putting some distance between the biobank and the population which constituted its database. The Finnish welfare state mindset dominated biobanking processes pointing at the public benefit of such processes (Tupasela et al., 2015). From this study, it becomes apparent that the internationalization of biobank databases is only one of the ways in which bio-objectification occurs. Despite the tendency for standardization being the norm, “the process of bio-objectification gives rise to forms of legitimation through which local, regional, national, and supranational actors seek to leverage and utilize samples in a more efficient way” (Tupasela et al., 2015). In other words, “certain specificities” regarding “national, regional, and institutional contexts” are co-constructing and bio-objectifying “populations and publics in relation to biobanking” (Tupasela et al., 2015). The public’s “engagement is understood in a very diverse manner” which is closely related to the “individual context of a given biobank populations” (Tupasela et al., 2015). These populations have become the target of bio-objectification processes through which they are ascribed various characteristics that biobanks and policy makers utilize in order to achieve legitimacy. The public is co-producing science and science is continually constructing the public as well. One can see the latter, through the ascription of characteristics, “as contributing to the bio-objectification of populations, which can also be understood in some respects as a form of population branding” (Tupasela et al., 2015). On one hand, the very populations are segmented and reconstructed as bio-objects, as databases for the production of bio-materials and bio-information. On the other hand, their products are the bio-objects of interest to be deposited in biobanks.

When considering biobanking processes within the framework of bio-objectification and the co-production of bio-objects, it is important to acknowledge the momentariness of bio-objectification. Through an analysis of an anonymous biobank (Xbank), Stephens & Dimond explored how institutional practices of biobanking played a crucial role to bio-objectification (Stephens and Dimond, 2015). Their research focused on how bio-value is assigned to objects through unexpected events and issues with biobanking institutions. More specifically, a 100-year-old database of bio-objects was found and saved by Xbank just before it was about to become biowaste, because the hospital in which it was deposited could no longer provide space for it. However, curating this database required funding which was cut off from this biobank leading to its eventual closure. Another biobank would then make use of some of Xbank’s database (Stephens and Dimond, 2015). This schematically presented case shows how unexpected events, infrastructure issues, and economic factors play a significant role in the conceptualization of bio-objects, along with the precariousness of biobanking. Bio-value was previously ascribed to the aforementioned bio-

objects. It was taken from them when economic factors took precedence and it was reestablished with the prospect of utilizing them from a biobank perspective. Momentariness can be seen “as a way of grappling with the related temporariness and perpetualness of biobanking activities, both anticipated and unanticipated” (Stephens and Dimond, 2015). On one hand, the status of bio-objects is temporary as they are regarded as such in a specific point in time. Conversely, bio-objects are perpetual in the sense that they can be reassigned bio-value given the circumstances. Thus, bio-objects created through bio-objectification are fluid and ever-changing as opposed to steady states and they “can contest and reconfigure the notion of life” (Stephens and Dimond, 2015). Moreover, “bio-objectification processes are not linear or have a specific path-dependency” (Holmberg et al., 2014), as they are subject to a multitude of sociotechnical factors, affected by the involvement of various actors and contingent on the sociopolitical and technoscientific paradigm. For instance, in the case of Xbank institutional, sociotechnical, and political key actors and arising necessities assigned the status of “bio-object” to materials previously regarded as bio-waste or simply waste and the opposite.

Finally, the process of bio-identification provides a crucial framework for understanding bio-objects, the manifestation of life’s objectification. Various sociotechnical factors, an expansive network of actors and “connectivities between biological material and the broader economic, social or political contexts, are co-produced with the biological phenomenon through a process of bio-objectification processes”, which lead to the bio-identification of bio-objects (Stephens and Dimond, 2015). A bio-object is identified as such through a reciprocal relationship with the concept of “life”, pushing and shifting boundaries to both directions. Another important issue related to bio-identification has to do with “the generative relations” which are co-produced by all the factors mentioned above (Stephens and Dimond, 2015). These relations do not only signify what the bio-object is, but they are also “premised upon what the bio-object could become” (Stephens and Dimond, 2015). Moreover, bio-objectification blurs the boundaries between various life forms, visible or otherwise, leading to “new ‘epistemic objects’ which mediate between practices of research and clinical care” (Boeckhout and Douglas, 2015), making bio-identification relevant on a practical level. To elaborate a bit, clinical practice may be based on the conception of a bio-object as such. Where the boundaries of this bio-object are drawn, in the case of human tissue or data for instance, clinical practice will follow. However, bio-objects within the biomedicalization paradigm arise through a co-production of clinical practice or care and medical research, which implies that the “integration of care and research at the level of data and tissue does not just involve changes in the ways in which data and tissue are collected for research; rather, it also implies changes in the uses of tissue and data for purposes of care” (Boeckhout and Douglas, 2015). This bio-objectification process that creates new epistemic products, i.e. new bio-knowledge, new bio-objects with broadened boundaries, is clearly reflected on clinical practice.

Conclusion

In summary, bio-objectification is a fluid and expansive concept which challenges the boundaries of our conceptualization of life. It is quite interesting to delve into the philosophical implications of bio-objectification processes within the biomedicalization paradigm and critically reflect on how technoscience de facto challenges our conceptions of life. However, it may be even more intriguing to see how bio-objectification is manifested through biobanking processes. This study attempted to focus on the latter, albeit on a high level. Standardization of biobanks, construction of populations, momentariness of bio-objectification, and the concept of bio-identification

are only a few of the key issues related to the co-production of bio-objectification in relation to biobanking. Future STS studies would eventually shed more light on the matter.

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