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MAKING UP PEOPLE AND STYLES OF SCIENTIFIC REASONING:
AN ARTICULATION OF HACKING'S PHILOSOPHY OF THE HUMAN SCIENCES

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Abstract

Making Up People and Styles of Scientific Reasoning:

An Articulation of Hacking's Philosophy of the Human Sciences

Lourdes M. Ortiz Bautista

This work offers a comprehensive reading of Hacking's project on making up people. Making up people refers to practices involved in the scientific classification of people, which may implicitly assume or foster the existence of human types. Hacking's works on human kinds have been presented in a fragmentary manner for over the last 30 years. Some of its central notions, such as "human kind" and "looping effects", have been critically received as stand alone notions within the debate between social constructivism and scientific realism concerning psychiatric categories. Despite his critical stance on social constructivism and his proposed reconciliation between social constructivism and scientific realism, Hacking's work has been read as a challenge to scientific realism. Hacking's account of human kinds in terms of the presence of looping effects, alongside his analyses of various classifications that have been revised and ultimately abandoned in the history of psychiatry, have contributed to that interpretation. Hacking's MUP, however, addresses the way in which the scientific classification of people works, rather than whether mental illness classifications are founded in nature or not. By focusing on classification from a historicist stance, Hacking is able to reconfigure the philosophy of the sciences in a distinct and unprecedented manner, presenting an original account on historical epistemology and ontology. It is not one argument, but a comprehensive reconfiguration of the philosophy of the sciences, which allows Hacking to go beyond the divide between scientific realism and social constructivism. This work brings together a larger set of notions to characterize Hacking's account of MUP, makes explicit the philosophical background on classification that supports it, and explores relevant connections to other aspects of Hacking's work, remarkably, his alternative project on the Styles of Scientific Reasoning. On the basis of such a comprehensive reading, it

responds to four representative criticisms. By assembling the elements of Hacking's MUP in a comprehensive and consistent picture, this work shows the extent to which it represents a major contribution to the philosophy of the sciences, introducing a distinct approach to the analysis of scientific concepts and a novel vision of the human sciences.

Keywords: human kinds, making up people, looping effects, psychiatric categories, scientific categories, styles of scientific reasoning, relevant kinds, historical ontology, historical epistemology, dynamic nominalism

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Introduction

Philosophers of science have by and large neglected the social sciences in their analysis and models of scientific knowledge. In particular, philosophical analyses of the scientific study of human beings were nearly nonexistent until recent years. The growth of the brain and behavioral sciences has made it urgent to engage in such philosophical study. Philosophers of special sciences such as Psychiatry, Psychology, and the Cognitive Neurosciences have made progress examining traditional themes in the context of the newer bodies of knowledge produced in their respective disciplines. Noteworthy within these recent philosophies are works on scientific explanation, natural kinds, and scientific realism (e.g., Bechtel 2008, Craver 2007, Cooper 2005, Cummins 1977, Gold and Stoljar 1999, Khalidi 1998, Kendler, et al, 2011, Kincaid and Sullivan, eds., 2014, and Murphy 2006). Ian Hacking's works on human kinds or kinds of people have been most widely received within the academic spaces created by such studies (especially, Hacking 1999 and 2002a). Hacking's works on the scientific classification of people, however, introduce a distinct approach to engage in the philosophical analysis of the sciences, including the sciences concerned with the study of human beings. Such an approach has not been clearly acknowledged in the philosophical literature. In this work I piece together the different elements that comprise Hacking's account of kinds of people, make explicit the philosophical background which supports it and offer some responses to representative criticisms of the account on the basis of my articulation. By assembling the elements of Hacking's account in a comprehensive and consistent picture, I show the extent to which his proposal represents a major contribution to the philosophical analysis of the human sciences.

Hacking's studies of "making up people" highlight the ways in which scientific classification enables the identification of people as being of a kind, opening and closing new possibilities of being. The idea that there are human types supported by scientific knowledge is not entirely new. It became a popular idea, for example, by the end of the Eighteenth Century and well into the Nineteenth Century, during the heydays of phrenology (Fower and

Flower 1857, and Wells 1890). During the late 1800s and especially the beginning of the 1900s, the growth of statistical knowledge, evolutionary thinking and psychoanalysis fostered and popularized studies on the physiognomy and character of types of men (Atkinson 1913, Davenport 1911, Gorgin 1913, Pick 1996). Today we may laugh and find amusing the old phrenology charts with their "moral faculties", such as Gorgin's portraits of "the criminal men" and the typologies of men based on character during the early 1900s, but we feel more comfortable with ideas such as "the autistic", "the bipolar", "the hyperactive", "the antisocial", "the aggressive", and many more labels, when applied to people's brains and behaviors (Dumit 2004, Gardin and Panek 2014, Strakawoski, ed. 2012, Wender 1987). With the exponential increase in experimental studies on the brain and the behavioral sciences, the idea of human types has acquired a distinct, "more scientific", character. Our understanding of ourselves, of what types of human beings there are and under which of those types we and our fellow human beings fit, has been deeply transformed.

Hacking popularized the notion of "human kinds" in the philosophical literature within the context of a discussion on social constructivism and scientific realism about mental illness.[1] Despite his critical stance on social constructivism and his proposed defense of a conciliatory view between social constructivism and scientific realism, Hacking's account has been taken as a challenge to scientific realism concerning mental illness. This has been further supported by Hacking's account of human kinds in terms of the presence of looping effects, alongside his analyses of various classifications that have been revised and ultimately abandoned in the history of psychiatry.

[1] The notion of "human kinds" may have been first introduced in the philosophical literature by Hacking in "The looping effects of Human Kinds" (Hacking 1995c). The broader notion of "making up people" was perhaps first discussed in a 1983 conference paper entitled “Making Up People” (Hacking 1986). In the reading I offer in this work I suggest that there is a consistency between the notions of "human kind" and "kinds of people". The notion of "human kinds" has received the most attention and criticisms within the philosophical literature. In this work I take "kinds of people" as the central notion of Hacking's comprehensive philosophical project of analyzing "making up people".

Hacking, however, has only tangentially touched on the debate between social constructivism and scientific realism. His account of human kinds addresses the way in which the scientific classification of people works, rather than whether mental illness classifications are founded or not in nature (or in society). Hacking's account of kinds of people offers a view on historical epistemology and ontology, rather than a foundational or a social constructivist view of mental illness. By focusing on classification from a historicist stance, Hacking is able to reconfigure the philosophy of the sciences in a distinct and unprecedented manner. It is not one argument, but a comprehensive reconfiguration of the philosophy of the sciences, which allows Hacking to go beyond the divide between scientific realism and social constructivism.

The idea that scientific objects are historical sociocultural entities is not entirely new, nor has it ever been free of polemics. T.S. Kuhn's view that the very world in which scientists work changes after a scientific revolution was perhaps the most radical idea presented in the philosophy of science during the twentieth century. Kuhn's shifting scientific worlds chiefly transfigured an old standing divide between realism and instrumentalism into the divide between scientific realism and social constructivism.

Positions abound, but the basic intuition behind the divide is simple: the scientific realist picture does not admit transient objects, which come into being and cease to exist with scientific theorizing and practices. Objects are not historical entities; they exist and are what they are independently of our representations. The history of science follows the path by which objects are discovered, not the ways in which they are brought into existence. Past scientific representations may have been mistaken in their identification of some objects, but those objects are not granted any sensible existence. In the constructivist picture objects are thought of as being shaped through scientific representation and practices, just like artists create sculptures by modeling matter. In the social constructivist picture scientific objects are bound to reality in time and space. They are historical entities that are born into a social milieu and may also die when the social world that sustains them and brings them into

existence is significantly altered. *The service that the history of science does to philosophy is not merely to account for the discovery of facts or scientific objects, but to expose the ways in which scientific objects are brought into reality.*

The view that scientific objects are historical entities has been recently discussed in the philosophy of science under the rubric of historical epistemology and ontology (e.g., Davidson 2001, Daston 2000, Hacking 2002a, Rheinberger 1997). The antecedent of this recently formed philosophical approach could be traced back, in the analytic tradition, to Ludwig Fleck's *Genesis and Development of a Scientific Fact* and, more generally, to the historicist approach to the philosophy of science (Fleck 1979). The works of T. S. Kuhn, I. Lakatos and P. Feyerabend are remarkable antecedents of Hacking's general view of historical ontology (e.g., Kuhn 1962, Feyerabend 1974, Lakatos 1978). Hacking's version of historical ontology as it relates to the classification of people in the human sciences is additionally inspired and influenced by the work of Michael Foucault. It is from Foucault that Hacking gets the idea for the name for his own analysis of the classification of human beings and their generation of kinds of people, namely, Making Up People (MUP henceforth).[2] Hacking's project of philosophically analyzing scientific classifications of people, and kinds of people as the scientific objects of such classifications, has no precedent in the history of the philosophy of science. In my comprehensive reading, I link Hacking's account of MUP to his broader philosophy of the sciences, to appreciate more fully its philosophical significance in relation to the philosophical tradition.

This work is primarily interpretative and systemic. In chapters 1 to 3, I introduce and articulate Hacking's two projects - the MUP project and the styles of scientific reasoning - and interpret, synthesize, and systematize the philosophical background that undergirds them. In

[2] Hacking acknowledges Foucault in several of his works on making up people. Hacking briefly elaborates on the label for his own analysis on "making up people" as directly related to Foucault's own works on "the constitution of subjects". Establishing the link, Hacking quotes the following passage from Foucault: "We should try to discover how it is that subjects are gradually, progressively, really and materially constituted through a multiplicity of organisms, forces, energies, materials, desires, thoughts, etc." (Hacking 1986, 226; Foucault and Colin 1980, 97).

chapter 4, the last chapter, I review some representative criticisms of Hacking's account of human kinds and offer a response to them on the basis of my interpretation. I conclude this work with a discussion on the epistemic and ontological view of kinds of people presented in Hacking's work and the picture of the human sciences that emerges from it.

The first two chapters introduce Hacking's MUP Project. Chapter 1 lays out the philosophical framework Hacking proposes for analyzing categories of people. The philosophical assumptions grounding his work include: 1) an understanding of categories of persons as relevant kinds—a notion developed by Hacking based on Nelson Goodman's work, according to which the validity of a class is dependent on the interest involved in its grouping; 2) "dynamic nominalism," a non-traditional view describing how naming practices interact with the objects named; 3) a Foucauldian view on power/knowledge and the ways in which people constitute themselves as subjects/objects of knowledge; and 4) the presence of the "looping effect," or the mutual and dynamic interdependence between categories and objects of categorization, in which kinds of people are constituted as objects of scientific knowledge. Chapter 1 also elaborates on Hacking's framework for analyzing categories of people, which integrates: "five vectors" of analysis (classifications, people, institutions, knowledge, and experts); seven "engines of discovery" (counting, quantifying, norms, correlations, medicalization, biologization, and genetization); and three social components (the normalization, bureaucratization, and reclamation of peoples' self-identities).

In Chapter 2, I synthesize the case studies comprising the MUP Project, emphasize their salient features, and highlight some additional notions in Hacking's account. I reconstruct the genealogies of five cases of MUP: homosexuality, which paradigmatically exemplifies the looping effect; criminality, which suggests a clear connection between MUP and the statistical style of scientific reasoning; child abuse, which shows how the medicalization of people and the use of the laboratory style together legitimize a category both as a scientific entity and as a kind of person; fugue, an example of what Hacking calls "transient mental illness," which incorporates the notion of the "ecological niche" into his

analytic framework; and multiple personality disorder, which illustrates the causal relevance of the scientific categorization of people and what it means to “act under a description,” as envisioned in the looping effect. Chapter 2 closes with a discussion of how Hacking’s views on categories of people play a part in the debates between scientific realism and social constructivism. To this end, I offer an interpretation of a particular polemic passage through the lens of my reconstruction of Hacking’s philosophical background, my characterization of his framework of analysis, and my analysis of his MUP case studies.

Chapter 3 articulates the philosophical background for Hacking’s alternative project on the Styles of Scientific Reasoning (Styles Project henceforth), and reconstructs the genealogies he suggests for each of the six “scientific styles of doing and thinking”: the mathematical, the hypothetical modeling, the experimental, the statistical, the taxonomic and the historico-genetic styles. I subsequently review the most philosophically relevant notions characterizing the styles—self-authentication, techniques of stabilization, and ontological debates. Hacking provides a heterogeneous but parsimonious analysis of the various rationalities operating in the sciences, and as such, provides a somewhat limited framework for understanding the ways in which the human sciences participate in making up people. To address this, I draw out the implicit connections between Hacking's two projects in order to describe how kinds of people are constituted by and respond to scientific classification. I close this chapter with a discussion on the interconnections between the two philosophical frameworks of Hacking’s MUP and Styles projects.

In chapter 4 I review some representative critiques against Hacking's account and respond to them on the basis of my interpretation. I first discuss Rachel Cooper's and Muhammad Khalidi's critique of Hacking's view of human kinds as distinct from other scientific objects due to the presence of looping effects, the former being characterized in terms of awareness. Second, I discuss Jonathan Tsou's criticism of Hacking's view of human kinds as unstable objects. Third, I discuss Dominic Murphy's criticism of Hacking's approach for overcoming the divide between scientific realism and social constructivism, as these relate

to the conflict between the competing explanatory agendas of the medical model and the biopsychosocial model of mental illness. In my response to these criticisms I emphasize Hacking's understanding of kinds of people as relevant kinds, his pragmatic understanding of causality and scientific ontology,[3] and (less directly) the possible roles played by styles of scientific reasoning in MUP. I close this chapter with a discussion of the epistemic and ontological implications of Hacking's characterization of kinds of people as "moving targets" as a result of the presence of looping effects.

[3] It is worth noting that has been reluctant to endorse pragmatism or neo-pragmatism, or to acknowledge a direct lineage between his views and any major Pragmatist. There are two exceptions to this: Hacking's defense of "pragmatic realism" concerning entities postulated within scientific theories and his support of Goodman's view on relevant kinds. When I refer to Hacking's views as pragmatic in this work, I primarily mean pragmatic in a Goodmanian sense, as concerning the relevance of kinds of people and their putative causal knowledge to us, human beings. Hacking elaborates on his stance on pragmatism in Hacking 2007c.

Chapter 1

Making Up People: Philosophical Background and Analytical Framework

This chapter presents the philosophical background and analytic framework of Hacking's MUP project. Hacking explores the "scientific" classification of people, whenever there is a presumed or implied class of personhood. Take, for example, the category "anorexic." This label may suggest a set of behaviors exhibited by a class of people whose physiology is characterized by a type of organic pathology (of the mind or brain), which brings about such behaviors. The scientific classification of this group of people may suggest or assume that there is an anorexic type of man or woman. Hacking's philosophical project contributes a heuristic toolbox for the philosophical analysis of such categories of people. *Instead of reifying abstract or idealized categories,*[4] *Hacking's approach allows us to identify a multiplicity of factors and actors involved in the formation and vindication of specific categories of people.* It is through the dynamic interaction of the multiplicity of factors and actors that kinds of people come into being, change, and, on occasion, cease to exist. By focusing on the dynamics of classification, Hacking's MUP framework allows us to put in perspective the reification of types of being by dominant theories.

The first section of this chapter introduces the philosophical background undergirding my analysis and application of Hacking's work, which comprises three complementary views on how classification works, especially as it concerns the classification of people: Goodman's notion of relevant kinds, Hacking's own earlier views of dynamic nominalism, and Foucault's views of power/knowledge in relation to the constitution of subjects. These views enrich Hacking's more recent analyses of how classification functions, how classifications of people relate to their objects of classification, and how the classifications of persons and the kinds of

[4] As it might happen in a naive view of social constructivism or labeling theory.

persons that they presuppose or imply come about. These views inform the central notion of Hacking's MUP: the looping effects of categories of people, or human classifications.[5]

The second section of this chapter presents the analytical framework for the philosophical analysis of Hacking's project. This framework is composed of a set of "vectors of analysis": a set of "engines of discovery" and a set of "social components." These sets specify the most prominent elements that may be involved in the looping effects of categories of people. The sets play a heuristic role; they are a conceptual aid in the analysis of these categories.

1.1. Philosophical Background

Hacking's MUP project offers a philosophical framework for the analysis of the classification of people, which presupposes or allows for the postulation of a type of personhood or (human) being underlying such categories.[6] It is a project concerning human ontology, the classification of people according to scientific theories and practices of the human sciences. These include all disciplines with a scientific pretense that study aspects of the human. Examples include anthropology, sociology, psychology, biology, and the cognitive neurosciences. Hacking's work on MUP shows how in their classificatory practices, the human sciences introduce and legitimize new kinds of being and acting that have otherwise remained closed to the peoples so classified.

Three concepts are of particular importance here: Nelson Goodman's notion of relevant kinds; Hacking's own views on dynamic nominalism and historical ontology; and Foucault's analyses of power/knowledge and the genealogies of the subject. These three

[5] In this work "categorization of people" and "human classification" are used interchangeably. In both cases, they refer to the grouping of human beings according to putatively scientific criteria. A central goal of this work is to make explicit what such grouping involves according to Hacking's MUP framework of analysis.

[6] It may be worth emphasizing that Hacking does not assume that there is such a type of personhood underlying these categories. Hacking's stance concerning the scientific realism and social constructivism divide are discussed at different junctures throughout this chapter. Hacking's defense of dynamic nominalism (discussed in section1.1.2) is particularly central to his stance on the relation between classifications and reality.

views provide MUP with a philosophical basis; they are indispensable for understanding some of its thorniest implications.

Hacking's views on categories of people fit with Goodman's notion of relevant kinds, which encompasses both natural and social kinds. Relevant kinds of people are non-essentialist and pragmatic, are devised for distinct purposes, and may be revised and transformed over time. Relevant kinds are examples of "dynamic nominalism," Hacking's version of nominalism. According to this, both classifications and the objects that they classify come into being through dynamic interaction. This implies an historical view of epistemology and ontology. Additionally, borrowing from Foucault's views on power/knowledge and the subject, the MUP project encompasses a range of elements (and the interactions between them), since all play a role in the formation of categories of peoples. This multiplicity of elements is framed within what Hacking calls "vectors of analysis." Like Foucault's analytics of power, Hacking's categories (and the kinds of people they categorize) "emerge" from the multiplicity of elements involved on a case-by-case basis. This contrasts with two-dimensional analyses which center on opposites, such as subject-object, theory-experience, and doctor-patient.

1.1.1. Relevant kinds

Hacking's account of MUP aligns with Nelson Goodman's notion of relevant kinds, first suggested in *Fact, Fiction and Forecast* and elaborated on in *Ways of World Making* (Goodman 1978 and 1983). Goodman meshes well with Hacking since he treats a given class as an arrangement of cross-cutting definitions, subject to revision.

Relevant kinds allow for some aspects in the definition of a given category to coincide even while others conflict (i.e., cross-cutting categories). The distinct and possibly conflicting items nonetheless share the same object of inquiry that mediates between the parts involved in the determination of the category. Categories of plants, such as marijuana, coca leaves, and peyote, are examples of cross-cutting categories; these are determined by

overlapping and contrasting taxonomies (e.g., ethnohistorical, ethnobotanical, psychopharmacological, and legal).

One central issue with the metaphysics of science concerns the foundations of scientific taxonomies. Whether they are to be found in nature or elsewhere is open to question. In these debates, nature is understood to mean an external, mind-independent, and/or ready-made reality. If indeed there are such taxonomies, they would support claims to natural kinds. The notion of natural kinds implies that there are discrete types of entities underlying nature, and that these objects, powers, and capacities exist independently of what human beings think, imagine, or wish they are. A taxonomy based on natural kinds presupposes a monistic and natural organization of things in the world. This conflicts with alternate man-made taxonomies organized around something other than putative natural kinds.

The framework of classification provided by relevant kinds accepts that some natural kinds, given certain purposes and contexts, may in fact be relevant kinds, and that some man-made taxonomies may also be relevant kinds. Whether the basis of classification is natural or otherwise does not determine that a given category is more apt than others. Attaching the term "natural" to a kind does not do any real work in scientific classification. Relevant kinds do not accept a fundamental metaphysical hierarchy; instead they suggest a pragmatic approach to classification, whose basis is found in the adequacy between categories and the goals of classifications. The notion of “relevance” that characterizes relevant kinds is a pragmatic one. The notion of "relevance", rather than "natural", plays a central role in Hacking's MUP.

The roots of the notion of relevant kinds are found in Goodman’s treatment and reformulation of the problem of induction (Goodman 1983). This problem is part of a family of problematic and interrelated issues, including counterfactuals, natural laws, predictions, kinds, and, as noted more recently, model-building and mechanisms (e.g., Glennan 1996). Goodman addresses the problem of induction when he holds that "[a] rule is amended if it

yields an inference we are unwilling to accept; and inference is rejected if it violates a rule we are unwilling to amend. The process of justification is the delicate one of making mutual adjustments between rules and accepted inferences; and in the agreement achieved lies the only justification needed for either" (Goodman 1983, 64).

The issue with induction, according to Goodman, is that evidence itself does not suffice to justify inductive inference. Rather, inductive inferences are vindicated by harmonizing the application of a rule (or law-like statement) with the fulfillment of the expectations of its application (its induction or projection). Kinds in general and kinds of people in particular work as such inductive rules. People either do or do not fulfill the expectations presupposed in a particular classification (e.g., this type of person behaves in this manner). The category of a given kind of person is not merely justified by a body of evidence; it also entails certain expectations about how such a putative kind behaves. When such expectations are not met (i.e., when the evidence is against the category), there is room to amend or vindicate the category depending on what is at stake. Along these lines, Goodman's "new riddle of induction" formulates the issue as a problem of projection: how to provide a criteria for selecting or vindicating adequate predicates (or hypotheses, rules, categories, etc.) while extending their extension (i.e., application to new instances), given the evidence available supporting them at a determinate point in time.

To illustrate the problem of projection, Goodman posited "grue," an imaginary predicate. An object is grue only in the case that it is observed before time *t* and it is green, or to all objects that are blue and were not observed before time *t*. Given the definition, the evidence available supports both that at time *t*—say, at the present time—a given object – say an emerald—may be inferred to be both green and grue. So, the problem goes, at *t*, all the instances of grue (e.g., a is grue, b is grue, etc., where a, b, and so on are individual instances) support the statement that "all emeralds are grue." However, given the definition of grue, the same evidence also supports both (the prediction that) (a) all emeralds (subsequently examined) will be green, and that (b) all emeralds (subsequently examined)

will be grue. If an emerald is examined at time t, it is grue; however, by definition, it must be blue and hence not green (i.e., the predicate “grue” does not apply after *t* to things that were green before *t*). Thus, Goodman presents the challenge: “if we simply choose an appropriate predicate, then on the basis of these same observations we shall have equal confirmation, by our definition, for any prediction whatever about other emeralds – or indeed about anything else” (Goodman 1983, 74).

Goodman’s basic point is that given a body of evidence, there is no basis to conclusively support either of the two (possibly inconsistent) statements. The new riddle of induction goes beyond the traditional challenge of providing a criterion for justifying the inference from the regularities observed up to a time *t* to future unobserved instances (this is a classical problem of induction). In fact, one could induce two distinct statements on the basis of the same evidence, leading to the challenge of determining which particular predicate would lead to the most accurate projections (e.g., “green” vs. “grue”). Goodman’s reorientation of the problem of induction consists of not “ask[ing] […] how predictions come to be made, but how – granting they are made – they come to be sorted out as valid and invalid" (Goodman 1983, 87).

Goodman introduces “entrenchment” as the solution to the problem of projectibility. According to entrenchment, the projectibility of a predicate is based on its record of successful usage, rather than on purely logical considerations. The entrenchment of a predicate (or a given hypothesis or kind) refers to its “record of past projections.” Good predicates are distinguished from ill-formed predicates on the basis of their record of successful projections. For example, since “grue” is less entrenched than “blue” and is not used in as many projections, it must be discarded in favor of “blue.” Goodman says, “[p]lainly

'green', as a veteran of earlier and many more projections than 'grue', has the more impressive biography".[7]

The reorientation of the problem of induction in the problem of projectibility generated a new set of questions, reconsidered in *Ways of Worldmaking. Fact, Fiction and Forecast* provided the background for the elaboration of the notion of relevant kinds, insofar as the core of Goodman's problem of projection is the absence of a foundational principle of classes (e.g., natural kinds, fundamental laws of nature), that is, a foundational criterion of membership for kinds. Goodman's solution—entrenchment—evolved into a discussion of anticipated worlds, worldmaking, and relevant kinds: "Induction requires taking some classes to the exclusion of others as relevant kinds. Only so, for example, do our observations of emeralds exhibit any regularity and confirm that all emeralds are green rather than that all are grue […] The uniformity of nature we marvel at or the unreliability we protest belong to a world of our own making" (Goodman 1978, 10).

Ways of Worldmaking picks up where *Fact, Fiction and Forecast* left off: "Without the false hope of a firm foundation gone, with the world displaced by worlds that are but versions, with substance dissolved into function, and with the given acknowledged as taken, we face the questions of how worlds are made, tested, and known" (Goodman 1978, 7). Contrasting them with natural kinds, Goodman conceived of relevant kinds as "habitual, traditional or devised for a new purpose," having no "absolute categorical or psychological priority" (Goodman 1978, 10). Such a contrast, nonetheless, was not intended to undermine the role that nature plays in the formation of some kinds. Rather, his intention was to show that kinds that are relevant in too many contexts are not natural kinds, which may conform to only a

[7] Goodman's notion of entrenchment is rather conservative, privileging the old over the new. Whether he fully endorsed the notion is open to interpretation. It is hard to see how Goodman's view allows for novelty: if the entrenchment of a predicate is the guide for projection, new predicates – lacking any record – would never be projected. What distinguishes successful from unsuccessful projections? Goodman only goes as far as saying that the selection between projectable and non-projectable predicates (or hypotheses) is based on how the world has been organized: "[t]he roots of inductive validity are to be found in our use of language [...] the line between valid and invalid predictions (or inductions or projections) is drawn upon the basis of how the world is and has been described and anticipated in words" (Goodman 1983, 121; See also Goodman 1983, 94).

very limited set of all the possible relevant kinds. Moreover, kinds may be relevant or irrelevant according to the purposes for which they are used and the system of description under which they are conceived: “If I ask about the world, you can offer to tell me how it is under one or more frames of reference; but if I insist that you tell me how it is apart from all frames, what can you say? We are confined to ways of describing whatever is described" Goodman 1978, 3). These systems of description constitute “world-versions,” which, being distinct in their respective interests, are irreducible to one more fundamental world. This, nonetheless, does not exclude the plausibility and value of some reductions, which in Goodman’s view are rather rare and only partial.

The suggestion of different world-versions, distinct in interests and consequently in their relevant kinds, entails a pluralistic view, which nonetheless needs not compromise its rigor or standards. Moreover, some unity among diverse worlds can be reached by the formation of an all-encompassing comprehensive organization. According to Goodman, “…universes of worlds as well as worlds themselves may be built in many ways” (Goodman 1978, 5). A large world comprised of many distinct and even contrasting worlds results in a complex ontology: "Motley entities cutting across each other in complicated patterns may belong to the same world. We do not make a new world every time we take things apart or put them together in another way; but worlds may differ in that not everything belonging to one belongs to the other. […] In other cases, worlds differ in response to theoretical rather than practical needs" (Goodman 1978, 9).

Goodman’s notion of relevant kinds can be used to understand Hacking’s project of making up people.[8] Being a flexible notion, which enlarges or compresses diverse world-descriptions as diverse interests on the same motley entity coming in or out of consideration,

[8] “[T]here are lots of kinds (and kinds of kinds), and no one has done more than Goodman to remind us of this. Yet, although he regularly writes of ‘motley entities’ even he, for his own ends, tends to put all kinds into one basket, precisely to de-emphasize absolute priorities and to emphasize how artificial kinds are as important to us as kinds of things that we find in nature. There is no harm in using one big basket tagged ‘relevant kinds’” (Hacking 1992a, 183).

the notion of relevant kinds makes it possible to examine the different and even conflicting perspectives on a given kind of people under analysis without granting categorical or psychological priority to any of them, and without needing to worry too much about reductions. Reductions may occur, but they are not to be dictated in a principled or *a priori* manner. As long as different world-versions are at play, they all make up the larger system of descriptions of a given kind of people. It is noteworthy that conceiving kinds of people as relevant kinds does not deny that under some descriptions, the motley entity may be described as a natural kind. What it does deny is that the description of that given motely entity as a natural kind has any foundational, categorical, principled, or psychological privilege over any other descriptions.

1.1.2. Dynamic nominalism

Hacking subscribes to nominalism, a philosophical tradition of classification dating to the medieval-era debate over universals. The realists maintained that general concepts are universal entities that pick out the essences of beings or things. The nominalists reject essences as grounds for the membership of entities within classes. Since then many philosophers have subscribed to variations of nominalism, including William Ockham, Duns Scotus, John Venn, J. Stuart Mill, William James, Charles S. Pierce, Bertrand Russell, Nelson Goodman, and W.V.O. Quine. Hacking adheres to this nominalist tradition (Hacking 1991d).

Hacking presents traditional nominalism as a view on the relation between the name (concept) and the named (its object of classification). Once in place, both the concepts and the objects remain permanently stable and fixed. Hacking reanimates the nominalist tradition by recognizing that the relation between the name and the named is dynamic. According to dynamic nominalism, concepts are not static. That is, they are not merely empty tags placed on things. Instead, once the tag is placed on an object, it becomes one with the object;

together, concept and object evolve in response to more knowledge as it becomes available through scientific study. Dynamic nominalism seems to cover all concepts (Hacking 1986).

The term “dynamic nominalism” did not appear in Hacking’s work until the mid-1980a. For instance, it does not figure in *the* discussion of Thomas Kuhn’s and Paul Feyerabend’s distinct versions of nominalism offered in *Representing and Intervening*, which suggests that Hacking was still formulating the notion (Hacking 1983). However, the seeds were already evident in such work, when Hacking advances the theory of the historicity of knowledge[9] and distances his position from Kuhn’s “revolutionary” paradigmatic changes. Conceptual change does not pose a threat to scientific rationality. Rather, Hacking notes that Kuhn’s threat to rationality only arises when one does not acknowledge the existence of a mind-independent world, and take fundamental conceptual changes, such as the change from classical mechanics to relativity theory, to occur in a vacuum of standards.[10] One such irrationalist view, Hacking argues, results when scientific analysis focuses on theory at the expense of experiment, just like the philosophy of science up to that time had done. Switching the focus from theory to experiment brings to light a sort of normativity implicit in the experimental practices and a sort of realism which admits the (theoretical) independence of the world at the level of practices. These two major theses advanced in *Representing and Intervening* are further elaborated in Hacking’s dynamic nominalism, which represents a shift not only from static to dynamic concepts but also from abstract theories to concrete practices.

Even though dynamic nominalism does not explicitly appear in *Representing and Intervening*, the following passage helps to clarify Hacking’s view: "Nominalism is about classification. It says that only our modes of thinking make us sort grass from straw, flesh

[9] This is captured by Nietzsche’s epigraph that opens the introduction to the book: “You ask me, which of the philosophers’ traits are idiosyncrasies? / For example: their lack of historical sense, their hatred of becoming, their Egypticism. / They think that they show their respect for a subject when they dehistoricize it – when they turn it into a mummy.” (Quoted from Nietzsche’s *Twilight of Idols*, Chap. 1, in Hacking 1983, I)

[10] It is worth noting that this was not intended as an attack on Kuhn himself, but on the reception of Kuhn, which Hacking believed implied a threat to both objectivity and rationality.

from foliage. The world does not have to be sorted that way; it doesn't come wrapped up in 'natural kinds'. In contrast the Aristotelian realist (the anti-nominalist) says that the world just comes in certain kinds. That is nature's way, not man's" (Hacking 1983, 108). This passage makes plain three aspects: (i) the connection between nominalism and classification as well as its stance against universals; (ii) that what is at stake is the plausibility of a (monistic) natural system of classification; and (iii) that the idea of a natural classification implies an essentialist view of the organization of things into kinds.

By putting the contrast between nominalism and essentialism in terms of these three points, rather than holding that classification mirrors the discovery of the essences found in nature, the nominalist takes the essences out of the picture. This reconceives classification as the systematic organization of nature (or otherwise). The nominalist rejects the realist view that the things in the world have an intrinsic nature, which makes those things what they are and pre-establishes the way in which they are to be classified. Hacking notes, however, that this view does not imply a denial of the reality of a mind-independent world (i.e., that "there is real stuff") but only a denial that "it is naturally and intrinsically sorted in any particular way, independent of how we think about it" (Hacking 1983, 108). In agreement with Goodman's view of relevant kinds, in Hacking's view, the sorting involved in scientific classification is framed according to interests that are relevant for the classifiers.

Hacking identifies in Kuhn's views on conceptual change a sort of nominalism that he dubs "transcendental nominalism" or "revolutionary nominalism," in which a new system of classification "produces a new way of addressing some aspects of nature, […] [provides] models, conjectured laws, classes of entities, causal powers which did not enter into the predecessor science" (Hacking 1983, 109). The reason why this position is nominalist rather than idealist (i.e., everything that exists is mental or ideas) is because it implies "the imposition of a new system of categories upon phenomena, including newly created phenomena" (Hacking 1983, 109). However, such an imposition does not deny the existence

of a pre-existent world (e.g., of common-sense objects such as tables and chairs).[11] In fact, in many respects, the old ontology translates into the new one, or continues to live outside of the new imposed worldview. The rise of a new conceptual system or system of classification does not necessarily negate a pre-scientific ontology (regarding entities such as cats, trains, people). That is, an independent world of objects that pre-exist and co-exist regardless of the imposition of a scientific system of classification. And yet, new systems of classification bring out “aspects of nature” that would not have shown up otherwise. This happens in time, insofar as the systems of classification available are the products of both the human mind and the resources available to make those unseen aspects of nature show up and conform to structures imposed on them. Hacking credits Kuhn with recognizing the possibility (and the actuality) of the alteration of systems of classification: "We can hardly avoid approaching nature with our present categories, problems, systems of analysis, methods of technology and of learning. We are in fact empirical realists: we think as if we are using natural kinds, real principles of sorting. Yet in the course of historical reflection we realize that the inquiries most dear to us may be replaced" (Hacking 1983,110). This implies that a system of scientific classification at any given time is not final.

The sort of nominalism that Hacking attributes to Kuhn, and the lesson that he extracts from it, is very close to one of the first characterizations of dynamic nominalism appearing in the context of Hacking’s discussion of kinds of people:

> Dynamic nominalism remains an intriguing doctrine, arguing that numerous kinds […] come into being hand in hand with our invention of the ways to name them. It is for

[11] Dynamic nominalism involves a realist commitment. In at least one occasion, Hacking suggests that dynamic nominalism could have been labeled instead "dialectical realism" (Hacking 2002a, 2). The sort of realism it involves, however, is of a pluralist and pragmatic sort. The pluralist realism it involves is similar to Dupre's promiscuous realism. According to promiscuous realism, there are different ways of organizing organisms into classes, relative to distinct and equally valid scientific taxonomies responding to distinct concerns for classification (Dupre 1993, 36). The view that a plurality of taxonomies could be equally valid suggests that there is no privileged organization, and that there are distinct ways in which to establish "sameness" relations to natural classes. The pragmatic aspect of Hacking and Dupre's pluralist realism consists in their emphasis that the organization of things, natural or otherwise, into classes is relative to the concerns addressed in devising the classification. That is also Goodman's account of classification as relevant kinds.

> me the only intelligible species of nominalism, the only one that can even gesture at an account of how common names and the named could so tidily fit together. It is of more human interest than the arid and scholastic forms of nominalism, because it contends that our spheres of possibility, […] are to some extent made up by our naming and what that entails. (Hacking 2002, 113)

Three characteristics can be noted: (i) systems of classification are a product of human invention; (ii) there is a fit between classifications and the objects they classified (so that (i) does not equal idealism); and (iii) the new systems of classification bring about a new ontology with them. That characterization also implicitly affirms the temporality of the systems of classification. The most significant difference between the uses of relevant kinds by Hacking and Goodman consists in their relative focus (i.e., Goodman on the traditional and Hacking on the novelty): “I follow Goodman back to kinds, but where he strikes down old distinctions I attend to new differences” (Hacking 1992a, 183).

Hacking’s dynamic nominalism seems at times to be described not only as a view on classification, but also as a way of doing philosophy. However, he states critically that "just because it invites us to examine the intricacies of real life, it [dynamic nominalism] has little chance of being a general philosophical theory” (Hacking 2002, 113). Nonetheless, Hacking has already provided us with a model for engaging in dynamic nominalism as a form of conceptual analysis throughout his works. Furthermore, his proposal on making up people offers us a vision of how dynamic nominalism could indeed become a systematic, if not general, philosophical theory.

Dynamic nominalism provides us with a model to think philosophically about knowledge and reality (systems of classification and their objects of classification) and engaging in a form of philosophical analysis grounded on the socio historical development of knowledge and reality. Dynamic nominalism prompts us to reflect on the very idea of what thinking and practicing philosophy itself entails, – as it offers us an heterodox way to analyze the dynamics of knowledge production, its implicit ontology and its validity standards. Switching to Goodmanian language, one could conceive of dynamic nominalism as a

philosophical program on conceptual analysis – an analysis of the different ways of kindmaking through worldmaking in the context of the classification of people in the human sciences.

1.1.3. Power/Knowledge and the Genealogies of the Subject

Foucault's influence on the MUP project cannot be overstated. Tracing the nodes that connect both projects falls beyond the scope of this work. However, it is vital to note some of the ways in which Foucault's genealogical analysis—which is at the same time an analysis of power and knowledge—impacts Hacking's work on how the human sciences, through the scientific classification process, create people's identities.

Foucault's genealogical analysis revolved around the exercise of power (e.g., the histories of penal rights, psychiatric power, the control of infantile sexuality, etc.). He asked: "If power is exercised, what sort of exercise does it involve? In what does it consist? What is its mechanism?" (Foucault and Gordon 1980, 89) The goal of such analysis was "to create a history of the different modes by which, in our culture, human beings are made subjects" Foucault 1982, 777). Human subjects, Foucault believed, are placed within relations of production, signification, and power. Foucault's economic histories, which essentially were studies of power, focused on legal and institutional models. These models, however, did not address Foucault's inquiries into the mechanisms and effects of the power relations in which human subjects are engaged. Foucault referred to these as "the rules of right that provide a formal delimitation of power" and "the effects of truth that this power produces and transmits, and which in their turn reproduce this power" (Foucault and Gordon 1980, 93). Social and political institutions (the state, capital, religion, tradition, etc.) assume normative standards (e.g., of truth and morality) that delineate both the behavior and the self-conception of the human subject. As such, these institutions have a role in shaping what people in a society consider "knowledge" or "socially permissible," and thus true, useful, objective, factual, or moral. Foucault formulated his guiding question as follows:

> What rules of right are implemented by the relations of power in the production of discourses of truth? Or alternatively, what type of power is susceptible of producing discourses of truth that in a society such as ours are endowed with such potent effects? What I mean is this: in a society such as ours, but basically in any society, there are manifold relations of power which permeate, characterize and constitute the social body, and these relations of power cannot themselves be established, consolidated nor implemented without the production, accumulation, circulation and functioning of a discourse. (Foucault and Gordon 1980, 91)

Power and truth, in Foucault's picture, are interwoven: truth is produced by the exercise of power, and power is exercised through the production of truth. In our global society, power is exercised through the institutionalization and professionalization of truth. "True discourses" confine human subjects to a social configuration in which the effects of truth are materialized when "we are judged, condemned, classified, determined in our undertakings, destined to a certain mode of living or dying" (Foucault and Gordon 1980, 93). Thus, the institutional force imposes truth through its power, and this same imposed truth goes on to justify its power. The two concepts are mutually dependent.

In his genealogical analysis, Foucault focused on specific rationalities: the localized systems, strategic apparatuses, and techniques by which human beings are dominated and, ultimately, normalized (Foucault and Gordon 1980, 103).[12] He claimed that since the nineteenth century, Western society has been characterized by a legislative discourse and disciplines based on the public right and social status of each citizen, whose goal is to preserve the cohesion of the social body it regulates (Foucault and Gordon 1980, 106). Foucault illustrated this in his analysis of the disciplinary power of state authority and psychiatric hospitals (Foucault 1979). Subjects must be shaped to see the world in the right way, and to work towards ends which are viewed as desirable. These social needs call for the application of disciplinary mechanisms which shape the subject such that they adopt, accept, and endorse certain valued norms. The overarching schema of the legislative

[12] The notion of "normalization" is discussed in chapter 1 section 2.3, and in chapter 3 section 2.4.

discourse, however, does not subsume the heterogeneity of disciplinary mechanisms; they produce their own discourses and their own apparatuses of knowledge.

Through disciplines, Foucault suggested, norms (rather than laws) are codified. The theoretical horizon of disciplines rather than the legislative discourse is the discourse of the human sciences; its mode of operation is that of clinical knowledge (Foucault and Gordon 1980, 107). The discourses of laws and discipline are the two sides of the exercise of power in what Foucault called our “normalizing” society. The role played by the sciences in such a society is twofold: it mediates the conflicts between the legislative and disciplinary discourses by presenting itself as a sort of neutral discourse; and it weighs the disciplinary mechanisms by which society is controlled, such as the medicalization of behaviors, conducts, desires, and discourses. These two roles are important. First, due to the heterogeneous nature of power, a "neutral mediator" (provided by the sciences) is seen as necessary to ensure an “objective” standard that both sides of a conflict can agree on (although this breaks down when two different scientific discourses support two conflicting institutions). Second, science is able to provide a framework to understand certain kinds of "problematic" and "desirable" behaviors as determined “causally”; and to provide either a method for removing the problematic cause (treatment, therapy, punishment, or incarceration) or positive reinforcement for desired behavior. This can be seen, for instance, in the ways in which psychological views on child development are called upon to inform how we should both educate and discipline children. It also can be seen in those “sciences” long ago discredited, such as phrenology, which attempted to predict criminality by examining skull shape. The sciences used in this way vary greatly in their methodology, epistemological justification, and object of analysis—but all result in the societal attempt to control the body.

In his analysis of power relations, Foucault used as a starting point the distinct forms of resistance against different forms of power. These resistances enabled him to locate and shed light on the methods used in the exercise of power. In Foucault’s view, power is not merely the imposition of a discourse over a determinate target (e.g., control of nature, control

of an exploited class by a dominant class, the control that a doctor exercises on the body or behavior of his patient). Rather, it is an arrangement of relations in which some (dominant) discourses are imposed and some (subjugated) discourses are opposed in resistance. These subjugated discourses comprise a whole body of knowledge disqualified by the scientific discourse. A genealogical analysis of the sort Foucault engaged in is thus concerned with the "local, discontinuous, disqualified, illegitimate knowledge against the claims of a unitary body of theory which would filter, hierarchize and order them in the name of some true knowledge and some arbitrary idea of what constitute a science and its objects" (Foucault and Gordon 1980, 84). The opposition of this subjugated knowledge is centered on the effects, not the contents, of the dominant "true discourse." Under these lines, a genealogy contributes to an historical emancipation of subjugated knowledge against the monopoly of a unitary, truth-making, scientific discourse.

Foucault's work on genealogy suggests that the "objective" views of the world upheld by various forms of scientific discourse shape the nature of subjects held as the objects of analysis—be they categorized as "homosexuals," "criminals," "alcoholics," etc. The subjects being analyzed have power to insist on their own narratives; they are not mere passive parties, even if dominant forces determine their fate. The Foucauldian influence on Hacking is evident in the central notion of the MUP project: the looping effects of categories of people. In looping effects, we see both the influence of dominant institutions (medical, scientific, judicial) and the forms of resistance, assimilation, and appropriation pursued by less powerful and even outright marginalized communities.

1.1.4. Looping Effects

Hacking's MUP project has consistently maintained that kinds of people are characterized by the presence of looping effects, defined as follows:

(i) The interaction between classifications and their objects of classification brings about a change in the experience that the people classified have of themselves.

(ii) People's awareness of their being classified in a given manner, or their experience of themselves as being of a certain kind, might produce a change in their behavior.

(iii) This change in behavior may be such that it motivates the revision of the classification that brought about the changes indicated in (i) and (ii).

Consider, for instance, the distinction between calling a dog "obese" and calling a 13-year-old girl "obese." Although some might argue that dogs exhibit a level of awareness, calling a dog "obese" would make no difference to the dog; it would fail to recognize itself as obese. However, labeling a girl "obese" could make a difference to her; she would perhaps question whether or not she is obese, or even begin to think of herself as obese. Moreover, as a result of her awareness of the way in which she is classified, she might try to lose weight or start feeling unattractive.

Whatever the effect, there is some room for the girl's experience of being classified as belonging to a certain kind to determine or influence her action. This space for possible action is closed to dogs: as they do not experience themselves as being of a certain kind, they thus cannot change their condition as a response to such an experience. While they might be forced to change their intake habits, for example, if their owners chose to feed them less, changing their constitution as a result of being classified as obese is open to them only through an outside agency –the actions of their owners. Dogs lack the sort of awareness that fuels human action (i.e., agency). Hacking elaborates on this in the following passage:

> Responses of people to attempts to be understood or altered are different from the responses of things. This trite fact is at the core of one difference between the natural and the human sciences, and it works at the level of kinds. There is a looping or feedback effect involving the introduction of classifications of people. New sorting and theorizing induces changes in self-conception and in behavior of the people classified. Those changes demand revisions of the classification and theories, the causal connections, and the expectations. Kinds are modified, revised classifications are formed, and the classified change again, loop upon loop. (Hacking 1995c, 370)

The looping effect highlights the changing and interdependent nature of the classifications under which human beings are conceived, insofar as the concepts that these bring about and the human beings who are their objects affect each other.

During the late 1990s, Hacking contrasted his work on the classification of people, as informed by the notion of "human kinds," with the contemporary philosophy of biology, heavily influenced by the notion of "natural kinds." In this way, Hacking attempted to avoid metaphysical debates between scientific realism and social constructivism. Hacking situated the notion of human kinds in relation to this pair of contrasting notions: "interactive kinds," which refer to classifications holding a distinct sort of relationship to their objects of classification, and "indifferent kinds," which do not. Interactive kinds are distinguished by the capacity of certain objects of classification—human beings—to intentionally engage in their own process of classification.

The purpose of differentiating interactive from indifferent kinds consists of highlighting the distinct role of concepts and objects in the formation of kinds. In the case of interactive kinds, the formation of categories is affected by the ways in which their respective objects of classification interact with their intended classification; but at the same time, without the intervention of a third party, indifferent kinds lack the capacity to contribute or react to their classification. The distinction between indifferent and interactive kinds provides an alternative way of presenting the looping effect: the idea that the reception of the categories given to a class of people may affect the ways in which the people so classified perceive themselves and the ways in which they behave.[13]

[13] J. Tsou (2007) rightly noted an ambiguity in Hacking's treatment of his notion of interactive kinds (Hacking 1999), which at times seems to refer to classifications and at other times to the people picked out by the class. Such an ambiguity presents itself if we take interactive kinds as a distinct class, within which human kinds fall into (among, perhaps, other kinds). In the comprehensive reading I offer in this work, however, I understand the notion of interactive kind as an add-hoc construct which is identical to the notion of human kinds or kinds of people, and was intended to call attention to the unique interactions that present between human subjects and classifications. In contrast to Tsou, I offer a more charitable reading under the light of dynamic nominalism and the broader project of MUP. Tsou himself notes in a footnote of his 2007 paper that Hacking's subsequent reformulation of his treatment of kinds of people within his 5-vector framework may address the ambiguity. Classifications and objects of

Hacking offered one of his most famous illustrations of the distinction between interactive and indifferent kinds: human beings and quarks. Under any conditions, according to Hacking, “calling a quark a quark makes no difference to the quark;” not even in the case that these were somehow transformed through human intervention (Hacking 1999, 105). Given that quarks lack the experience of both themselves and their being classified as objects of a certain kind, on their own they cannot interact in response to their classification. The only scenario in which they can behave differently is through intervention: either the direct manipulation by a human being, or via a device set up by a human being designed to accomplish a purpose (e.g., a particle accelerator). Human beings, in contrast, can and do react in different ways to their classifications.

The notion of interactive kinds was intended to acknowledge not only the peculiar fact that human beings, unlike other objects of classification, are aware of others and themselves, but that the ways in which they are classified have an impact on the way they interact with themselves and others. In other words, the ways in which human beings are treated according to their classifications in turn influences their experience of themselves and their behavior, which further affects their study and the subsequent classification that they are given.

Interactive kinds are characterized by humans’ capacity for active awareness and their capacity to act upon it. The fact that the category of interactive kinds includes only humans is no surprise. From its introduction, the purpose of the category seems to be setting human kinds apart from natural kinds by emphasizing their differences in terms of the interaction that their respective objects hold with their classifications, rather than in terms of nature, artifice/artificiality, or otherwise.[14] Hacking states: "This ugly phrase [interactive kinds]

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classification (kinds of people) inter-constitute each other in a dynamic interaction. In such a reading we can understand interactive kinds as bringing together classifications and people by specifying the type of interaction characteristic between them.

[14] As suggested by his rejection of an essentialist or definitional view of natural kinds, Hacking’s treatment of kinds of people is not so concerned with determining the natural basis for a given

has the merit of recalling actors, agency and action. The inter may suggest the way in which the classification and the individual classified may interact, the way in which the actors may become self-aware as being of a kind, if only because of being treated or institutionalized as of that kind, and so experiencing themselves in that way" (Hacking 1999, 104). What distinguishes the classifications of people is the interaction between classifications and objects of classification, not the basis of the classification itself (e.g., whether or not there is "natural grounds" for their classification).

A close reading of the passage reveals the central aspects of the notion of interactive kinds that provide the bases for Hacking's early account of human kinds. First, human kinds are characterized by a peculiar interaction between classifications and their objects of classification: human kinds are interactive kinds. Second, the interaction that characterizes interactive kinds is not only one between language (words) and entities (world), but also one between people, insofar as being classified in a particular way results in being treated by others in one way or another, according to available resources and institutional arrangements. Third, awareness is distinctive of the sort of interaction that characterizes interactive kinds. This might take place in a direct way, as in the recognition of oneself as being of a certain kind, or in an indirect way, as when people are identified and treated by others as being of a certain kind. Fourth, the subjects of the classification of interactive kinds are not merely receptacles of classifications, but actors. The classification is not just a top-down labeling that fails to impact the self-understanding and behavior of the people classified. People are not merely objects to be classified; they are also agents.

Furthermore, it is worth reiterating three points that characterize Hacking's theory of "the looping effect," found in both his early work on human kinds and in his more recent formulation of his analytic framework:

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classification of people, but rather to account for the different forces that foster its creation and stabilization. The search for the natural basis of a given classification is just one force among many others. Accounting for such forces make it possible to determine the relevance of a given classification, and thus its aptness.

(i) The interaction between classifications and their objects of classification changes the experience that the people classified have of themselves;

(ii) People's awareness of being classified in a given manner, the experience of themselves as being of a certain kind, might produce a change in their behavior; and

(iii) Their change in behavior motivate the revision of the classification that brought about the changes indicated in (i) and (ii) in the first place.

While distinct, the notions of interactive kinds and the looping effect also overlap. On the one hand, the concept of interactive kinds emphasizes that when it comes to humans, classifications and the classified people interact in a peculiar way: people experience themselves as being of a certain kind, and act or are treated accordingly. On the other hand, the looping effect highlights the changing and interdependent nature of human kinds, insofar as the classification of human beings and the human beings they classify change each other in their interaction. Without the sort of interaction that characterizes interactive kinds, no looping ensues.

Given this fact, it is worth noting that the looping effect implies not only a revisionist view of knowledge about people but also a peculiar ontological perspective. The changes it foresees occur not only at the level of classifications but also at the level of the subject's experience and behavior.[15] That is, the objects are subjected to change: the experience and

[15] Hacking also suggests that there are cases in which looping occurs at the biological level. He terms this "biolooping" and, differentiating it from classificatory looping, relates it to the phenomenon of biofeedback in yoga studies. Whereas biofeedback involves the conscious control of organic phenomena in the case of yoga, biolooping involves a correlation between a mental state, such as having an optimistic attitude, and a biological outcome, such as a better prognosis for breast cancer patients. In the case of biolooping there may not be a conscious control of the biological process, yet the state of the body is still altered. Hacking also considers as cases of biolooping the effects of psychobehavioral treatment on the increase of serotonin levels of depressive patients not treated with chemical interventions. On this Hacking states: " This phenomenon [biofeedback], which is well established but not understood, is distinct from the looping effect of interactive kinds. For lack of better nametags I shall call the mind/body effect biolooping, by analogy with biofeedback. The other is classificatory looping. I need the distinction because of course, in particular cases, both types of looping may be at work, and indeed mutually reinforce each other." (Hacking 1995c, 109-110). I thank Prof. Tsou for bringing the notion of biolooping to my attention.

behavior of people changes as a result of the classifications under which they are understood, and those changes in turn motivate the revision of the classifications by the experts who study or utilize them (e.g., bureaucrats, caregivers, educators). People and classifications change and constitute each other in a dynamic interaction, which makes kinds of people of a peculiar sort. This view of the dynamic constitutive interplay between classifications and people remarkably illustrates Hacking's dynamic nominalism. In Hacking's analysis, the presence of looping effects is unique to human beings and their classifications, and the study of the making and the dynamics of kinds of people suggest the need for change in our views of ontology. According to the looping effect both classifications and people themselves play a role in the constitution of an "interactive kind". This also illustrates the sense in which Hacking's nominalism is dynamic. Dynamic nominalism does not merely entail a top-down labeling, but also a bottom-up effect contributed by the changing ontology that is labeled. Both classifications and ontology change in a dynamic inter-constitutive relation.

Homosexuality is one of the clearest illustrations of Hacking's looping effect. Since the category of "homosexuality" was first applied in a top-down manner by experts (mainly, psychiatrists), people classified as homosexual initially resisted the label. However, they eventually appropriated and redefined the term; that is, they took it away from the medical and legal discourse by reacting against its negative connotations, to the point of radically transforming its meaning. The most obvious of those transformations was the dissociation of homosexuality from mental illness.

Although one may think, for the sake of simplicity, that there are two sides to the looping effect (concepts and people, which interact to change each other), the picture is more complex. It involves all the diverse elements that affect the making of the concept (e.g., the institutions and bureaucracies within which the notion is generated through the treatment of the peoples identified as being of a certain kind, as well as the theoretical or methodological

perspectives for studying the class), and the levels at which the people so classified may react (e.g., psychological, cognitive, social).

Hacking's discussion on the ways in which Foucault and sociologist Erving Goffman may be brought together to analyze making up people effectively shows the complex character of the looping effect and its central role in MUP. The contrast that Hacking makes between Foucault and Goffman consists in their respective approaches to study the constitution of human identities. Whereas Foucault presents abstract "top-down" analyses which focus on the institutions under which kinds of people are fostered, Goffman presents groundwork "bottom-up" analyses which focus on the "face-to-face" interactions between the different actors involved in the constitution of human identities. The point of reference in Foucault's analysis is his accounts of *The Birth of the Clinic* and his study of the origins of the prison in *Discipline and Punishment* (Foucault 1994 and 1979). Those sites, whose origins, norms, spatial arrangements and so on, are studied by Foucault, are close to if not identical to what Goffman called "total institutions" - prisons, mental hospitals, concentration camps, monasteries, boarding schools, naval vessels (Hacking 2004b, 287). The point of reference for Goffman's face-to-face analyses are *The Presentation of Self in Everyday Life*, *Asylums,* and *Stigma* (Goffman 1956, 1963 and 2009). Goffman primarily studied the interactions between the actors inhabiting total institutions, the roles that agents take within their constraints and possibilities, and the way in which agents challenge and change institutional norms, and in so doing also alter their identities.

The distinction between Foucault and Goffman further clarifies Hacking's notion of the looping effect and the role it plays in MUP. In particular, it distinguishes Hacking's notion and the role it plays in MUP from both Foucault's and Goffman's studies as well as from labeling theory. First, Hacking reads Foucault and Goffman as offering distinct approaches to study MUP, one abstract top-down and focused on institution, the other down-to-earth bottom-up focused on everyday interactions. Hacking's MUP is interested in both institutional and everyday interactions. But Hacking's MUP does not only integrate top-down and bottom-

up analyses, it also differentiates in its focus of analysis, namely, kinds of people in so far as these are the product of scientific classification. In this respect his work is closer to Foucault's philosophical history than to Goffman's sociological theory. Second, Hacking reads both Foucault and Goffman as offering dynamic accounts of MUP, just like his own account, which differentiates the three of them against labeling theory. Here I am not particularly concerned whether Hacking's interpretation of Foucault and Goffman fits his dynamic nominalist framework, as he claims, but on how he differentiates himself from labeling theory in terms of his underlying philosophical commitment to dynamic nominalism. Whereas labeling theory, Hacking contends, assumes a static nominalism in which the introduction of labels - whether scientific or in general cultural - makes up identities, under Hacking's dynamic nominalist such identities are not fixed labels. At this point the last step in the schematic formulation of the looping effect is relevant: for the looping to take place, the classifications which were introduced in the first place are also transformed in response to people's roles and agency. The looping effect, differently from labeling theory, does not make up realities through labeling, but also suggest that the introduction of scientific classifications fosters the transformation of reality itself (i.e., the people they categorize) and in turn people also transform their classifications.

The looping effect is, in a way, just the outer layer of a variety of aspects that make distinct kinds of people. However, the notion of the looping effect has two particular aspects worth highlighting. First, it emphasizes the key role played by the reception of the classifications on the part of the people classified in the development of the classification itself. Second, it emphasizes the dynamic and changing nature of the classes, both classifications and human beings (the objects of classification). Hacking’s framework of analysis in MUP hints at the diverse elements at play in the making and looping.

1.2. Making Up People: An Analytic Framework

In "Kinds of People: Moving Targets" (Hacking 2007a), Hacking presents the most elaborate and systematic version of his MUP project.[16] He introduces a framework for the analysis of MUP comprised of three sets of elements: one set of five vectors of analysis, one set of six "engines of discovery," and one set of three elements with a more social character. These three sets identify:

i) the diverse elements which play a role in the formation of classifications advanced within the human sciences, whose objects of classification are people (five vectors)

ii) the procedures involved in the research and discovery of knowledge about the intended target objects and the phenomena involved in those categories (six engines), and

iii) the social aspects which are impacted by the application of the categories, which in turn also impact subsequent applications of and inquiries on the kinds of people in question (three extra elements).

1.2.1. Five-Vector Framework

In his most recent work, Hacking presents a five-vector framework for the analysis of MUP: 1) classification, 2) people, 3) institutions, 4) knowledge, and 5) experts. These vectors are central elements of MUP and the looping effect, and thus also enrich their characterization. Through the interaction of these five, MUP takes place; new kinds of people are brought into being.

[16] Hacking abandons the terminology used during the late 1990s and adds new elements to the framework. Some of his commentators and critics have suggested that Hacking's reformulations are substantive enough that some of the early criticisms may no longer be applicable. I argue that there is a continuum between his two formulations: the same philosophical background presented in section 1 of this chapter underlies both versions. However, there are some important differences between his work in the 1990s and his current work, which do address his critics; I indicate these by the end of chapter 2 section 2.

The first two elements of the framework – classification and people – have been noted in the sections on relevant kinds, dynamic nominalism, and the looping effect. At this point, a few caveats are necessary. Hacking's work on MUP conceives of human classifications as cases of relevant kinds. This implies that there are no foundational principles for classes of people, and there is no description of given kinds that is privileged in a principled manner.

A classification consists of one linguistic and one extra-linguistic (i.e., ontological) component. The linguistic constituent is divided into names and descriptions. A diversity of descriptions of an entity identified under a single name could be given at any given point in time. Some of these descriptions may differ and take part in distinct systems of classification; yet at the same time, all of them constitute part of a class of people understood as a relevant kind. People are sorted under these diverse descriptions, and their associated labels constitute the extension of the class. In other words, each and every individual tagged as an "x" (name) under a given set of associated descriptions is his or her object of classification. It is worth emphasizing that the object of the classification of kinds of people is thus a plurality of objects – a plurality that is, furthermore, both motley (i.e., characterized in terms of overlapping and diverse descriptions) and changeable (i.e., people – their experiences, behaviors, treatments– change in response to the descriptions under which they are categorized). The categories of people are subjected to change in response to the change they bring about in the objects that they categorize.

As previously noted, institutions, implicit in looping, are explicitly acknowledged as the third element of Hacking's five-vector framework. These are described as "organized and structured entities" as a way to distinguish them from "mere practice and custom" Hacking 2007, 296). For example, Hacking observes that the people who experience themselves as being of a certain kind might do so as a result of the treatment they receive within institutions. Along those lines, "…actors may become self-aware as being of a kind, if only because of being treated or institutionalized as of that kind, and so experiencing themselves in that way"

(Hacking 1999, 104). Classifications exert influence on people through institutions, for not only are people identified as being of a certain kind, their identities are socially enforced and reinforced.

Three sorts of institutions fill this role: those within which knowledge of the classification is studied (e.g., academic institutions), those within which knowledge is implemented (e.g., schools, clinics, governmental programs, asylums), and those by which the classifications and/or their implementations are challenged (e.g., social movements and organizations like the anti-psychiatry coalition, Mind Freedom, Mad Pride, and the neurodiversity movement).[17] The exercise of the classifications through institutional practices contributes to the legitimization of the classifications and the kinds of people they bring about; other institutions challenge such legitimacy.

The fourth element in the framework is "knowledge," which is directly linked to institutions insofar as they confine its practice. Claims to knowledge generate and legitimate the classifications put into practice. Hacking himself endorses a rather relaxed notion of knowledge: all of the descriptions of a given kind which are taken to have some causal import—that is, all the descriptions which could be selected for the sake of explanation or interventions.

Later in this chapter, I discuss what Hacking means by "causal knowledge" in his analysis of kinds of people. At this point, however, it is sufficient to note some of its basic features and commitments. In contrast with "justified true belief," Hacking explains, "causal knowledge" is

> …something more like Popper's sense of conjectural knowledge. More specifically, there are the presumptions that are taught, disseminated, refined and applied within the context of the institutions. Especially there are what are presented as the basic facts […] Basic assumptions that we later regard as ghastly mistakes interact with

[17] There are more organizations ranging from local small self-help and advocacy groups around different labels than I can give credit in here. Further information about the mentioned groups could be found in: mind freedom, http://www.mindfreedom.org/; mad pride, https://en.wikipedia.org/wiki/Mad_Pride; and neurodiviersity, https://autisticuk.org/neurodiversity.

> people and classifications just as much as the facts that we hold to be stable, true, and beyond controversy. (Hacking 2007a, 297)

This view of knowledge is congruent with both relevant kinds and dynamic nominalism. As a conception of knowledge it embraces a type of fallibilism, wherein the institutions in which knowledge is produced, reproduced, and transmitted legitimize what we know at a given time. As pointed out previously, the institutions that Hacking has in mind in the third point of his analytic framework includes both academic and research settings, as well as institutions with a more practical role such as the state, the private sector, philanthropic and non-profit institutions.

Whereas some of the knowledge that is accepted in that context remains within specialized circles of experts, other knowledge is popularized among the masses. Furthermore, everything comes together: both legitimate knowledge and mistaken views are taken as legitimate at given points in time. The epistemic resources available at a given time provide the conditions for establishing what is and is not the case. Moreover, what counts as relevant knowledge and problems depends upon place, time, and epistemic conditions.

Evidently, Hacking's view on knowledge recognizes and even emphasizes the social dimension in knowledge production. However, there is more to that level of analysis. It also entails a deeply philosophical view of the nature of knowledge, its change, and its legitimization. Knowledge about kinds of people is not static; it is fallible and dynamic. Such a fallibilist commitment, nonetheless, also assumes that there are also some facts believed to be "stable," "true," and "beyond controversy." Providing an account of the stabilization of these facts is one of the central goals of the philosophical analysis of a given kind. Dynamism and stability do not exclude each other; they coexist. Logically, therefore, we must ask how can we distinguish legitimate from illegitimate knowledge? The analytic framework suggests at least one answer: the experts, the fifth element in the framework.

Hacking intuitively includes the experts within his framework, attributing to them the roles of "[generating] or [legitimating] the knowledge (d), [judging] its validity, and [using] it in

their practice… [working] within (c) institutions that guarantee their legitimacy, authenticity, and status as experts…. [and studying], [trying] to help, or [advising] on the control of the (b) people who are (a) classified as of a given kind" (Hacking 2007a, 297). Thus, according to Hacking, experts play both an epistemic and a practical role. On the epistemic side, they generate and validate knowledge about kinds of people. This, of course, also implies the production and standardization of the strategies for the generation of knowledge and the norms and techniques for its validation. On the practical side, the communities of experts set the objectives for the generation of knowledge and lay down paths for present and future interventions (which, by its very definition, changes their object, i.e., people, in the very interaction). The experts do not need to agree all of the time on what counts as the norms of validation, legitimate knowledge, or the most favorable paths of intervention. They might be members of communities that endorse competing principles, theoretical assumptions, and objectives.

1.2.2. Engines of Discovery

The second set in Hacking's account of MUP consists of seven "engines of discovery": counting, quantifying, norms, correlation, medicalization, biologization, and genetization. While acknowledging that some readers may consider these obvious, Hacking points out that they have been ignored in the philosophical literature. Each engine specifies a different dimension of analysis of kinds of people. Together, they comprise the heuristics in what the post-positivist philosophy of science would have called "a logic of discovery." They can be subdivided in two subsets, one concerning the identification, quantification, and generalization of groups of peoples (i.e., the first three engines), and the other concerning their pathologization and the associated search for causal markers for the sake of normalizing.

In MUP analysis, counting is not just of any sort. For example, it is not conducted for strictly instrumental reasons, such as taxation and recruitment, which have been recorded in

historical sources since ancient times. Rather, according to Hacking, the sort of counting which is relevant is a relatively recent phenomenon: the scientific counting first developed in terms of probabilistic theory, which was taken up by the social sciences in the form of statistical techniques. Hacking's work on the origins and evolution of this sort of counting is remarkable. He has identified a name, time and location for this phenomenon – the avalanche of printed numbers – which took place in Europe from around 1820 to 1840. It is not that no counting had taken place previously. However, before the avalanche of printed numbers there was no systematic counting of the kind that is vital for the study of social patterns, such as that used in Durkheim's 1897 study on suicide that marked the birth of sociology (Hacking 1975b, 1990, 1992c).

This sort of systematic counting generates the conditions for the development of systems of classification on the basis of the quantification of ("raw") data, which presupposes the creation of standards or norms, i.e., standards for counting, and demands that they be used in subsequent counting and quantification. Quantified data allows the identification of patterns and relations, which are established in the form of correlations. Hacking's view here may be summed up as follows: the less knowledge there is about the quantified phenomena, the less informative and weaker the correlations; the more knowledge there is about the quantified phenomena, the more sophisticated and informative the correlations.

The fourth, fifth, and sixth engines of discovery highlight the tendency, illustrated in many debates, to medicalize and naturalize kinds of people. This stems from the conviction that many of the characteristics around which people are grouped into classes are the result of medical conditions, that there is something pathological about the conditions under study which has to be modified in order to normalize a given individual. Such pathology or disorder, it is generally believed, may have as its cause a biological condition (e.g., a brain mechanism, a hormonal imbalance, a genetic predisposition). Clinical studies, which also count and systematize, sort people according to the possible causes of those general health conditions. People and their conditions are subsequently studied by biological scientists, who

search for more than correlations – namely, causes. This causal program aims to locate the mechanisms at the genetic level. As Hacking puts it, this is almost an act of faith; these hopes are supported by the success of well-established results, which in turn are expected to extend to new cases.

1.2.3. Social Components

The last three elements in the framework of analysis are normalization, bureaucratization, and the reclamation of peoples' self-identities. These are differentiated from the other two sets in that they have a more social and practical character, derived from both the interactions among the other elements in the framework and the search of knowledge and interventions through the use of the engines of discovery. The additional aspects highlight the role of the implementation of the knowledge produced and established by the whole range of both vectors and engines of discovery; and in doing so they link knowledge production to society.

Knowledge about kinds of people is produced with the objective of not only understanding or explaining but also devising strategies of intervention and "normalization" (e.g., the modification of the pathological behaviors associated with a kind of people under study). Therapies, pilot educational programs, drugs, exercise routines, and the like are designed for the sake of modifying behaviors, bodies, and minds. The aim of normalizing people's behaviors presupposes an idealized type to which people's deviant behaviors must conform. Presumably, the knowledge of this ideal type is derived from the norms established by means of the engines of discovery. The goal of normalizing people's behaviors belongs to the human sciences, and to society at large. Generally, the interventions are not confined to the lab or academic institutions, but are implemented within bureaucracies such as schools, hospitals, jails, support groups, and independent and governmental services. All of these entities undertake the task of determining who needs help (and who does not), which implies the determination of who does and who does not fall under a given classification. The

implementation of the strategies of intervention through these bureaucracies constitutes the third element in the third set under consideration.

In their reception of the classifications assigned to them within the bureaucracies, people play a critical role in the formulation of these classifications. As suggested by the notion of the looping effect, people may accept, reject, reinforce, or transform their classifications. This happens at the level of the individual, as well as, more importantly, through associations of individuals that may transform into well-organized collectives and bureaucracies visible in society as public actors. Through these associations, people may contest the alleged knowledge of a given kind of people, the pathologization of some of its associated behaviors, the strategies of intervention in their normalization, and the very characterization of the condition (e.g., their behavior and experiences). In this, the people reclaim their own self-identities.

The last three points highlight the sociological dimension of Hacking's MUP project. The last two, furthermore, acknowledge the epistemic role played by the people who are classified. The three sets (i.e., the five elements in the analytic framework, the six engines of discovery, and the three additional elements) provide insight into the epistemological, ontological and, to some extent, the methodological implications of Hacking's account of kinds of people. They also make explicit his acknowledgement of the indispensability of a social dimension in the philosophical analysis of the classification of people.

In this chapter, I introduced the views on classification undergirding Hacking's MUP project and the framework of analysis suggested by it. The MUP project integrates Goodman's views on relevant kinds, Hacking's own views on dynamic nominalism, and Foucault's views on the genealogies of subjects. In combination they support a view on classification as it applies to people. We thus arrive at the following views. First, there is neither metaphysical or epistemic priority nor exclusivity in the classification of people at lower levels of analysis (e.g., the physiological or genetic), but a multiplicity of organizational

criteria which are relevant or irrelevant according to a diversity of goals for their organization. Second, the categories under which people are conceived of are subjected to revisions resulting from the interaction between these categories and the people classified by them. Third, the interactions among categories and the people they classify do not merely occur in the abstract, but are negotiated through social institutions and media (e.g., schools, prisons, civil movements; books, pamphlets, media, protest). These interactions are complex in both the number of elements participating in the determination of a given category and in the directionality in which power is exercised.

Hacking's analytic framework provides a heuristic toolbox for the philosophical analysis of categories of people. It serves in the identification of common aspects, which may play a role in the determination of a category of people. Hacking insists that no two identical cases of MUP can be found. Some elements in the three sets envisioned – the analytic framework, the engines of discovery, and the three social elements – may or may not be found in a given case, and yet they would serve well to advance the analysis of any category of people of interest.

Chapter 2

Making Up People: Examples and Complementary Notions

Hacking elaborates on several cases of MUP, some in lengthy detail (Hacking 1995a and 1998), and others relatively briefly, as illustrations of his overall project (Hacking 1988d, 1992b, 2001a). In this chapter, I review Hacking's analyses of homosexuality, criminality, child abuse, fugue, and multiple personality, emphasizing how these categories emerged, and how they may illustrate some of the notions in Hacking's general account of MUP. His studies also exhibit the conceptual shifts (and their philosophical import) that result from the dynamic interaction between the classifications and the people they classify, through the institutions and distinct social settings within which they are implemented.

In section 2.1, I discuss Hacking's case studies aforementioned and in section 2.2, I discuss some additional concepts which further enrich Hacking's analytic model of MUP: action under a description, causal knowledge, transient mental illness and ecological niches. In the last section of this chapter 2.3, I offer an interpretation on the basis of my reconstruction of Hacking's MUP of one of Hacking's most polemical passages on the semantic resolution between scientific realism and social constructivism.

2.1. MUP Exemplars

The case studies that I discuss in this section exhibit some elements of Hacking's MUP analytic framework and its complementary notions, each in a distinct manner. Some case studies illustrate more clearly some notions; for instance, the notion of looping effect is remarkable in the cases of homosexuality and multiple personality disorder (MPD). No case study exemplifies each of MUP's notions. For example, the notion of an ecological niche only figures explicitly in the case of fugue. The purpose of this section is not to provide a full analysis of how each of MUP's notions appear in each of the case studies, since they play only an heuristic role in the analysis MUP's cases. Rather, my goal in reviewing Hacking's case studies is to highlight the character of the sort of analysis suggested in MUP.

2.1.1. Homosexuality

Hacking uses the case of homosexuality to illustrate the notion of the looping effect, building on the work of Michel Foucault and Kenneth Plummer (Foucault 1990 and Plummer 1981). He argues that homosexuals —as type of man engendered by scientific classification— emerged and came into existence in the mid nineteenth century. First described (and prescribed) within medical and legal contexts, eventually "the people categorized as homosexuals took over the ownership of the concept, and changed names, changed meanings, changed the world" (Hacking 2002a, 105). Reacting against the negative connotations of the associated medical and legal descriptions, the very first men classified as "homosexuals" detached the notion from the medical and legal discourse and radically transformed the meaning of the category. The most obvious of the transformations was the disassociation of homosexuality from the psychiatric taxonomy.

According to Foucault, homosexual behaviors, together with other forms of deviant sexuality (e.g., adultery, rape, incest, infidelity, marriage without parental consent, bestiality), were perceived to be "unlawful" acts under both religious and civil law. The shift from this religious and legalistic conception of homosexuality to a "psychological, psychiatric and medical category" was due to the transposition of the practice of "sodomy" from the juridical subject of a set of forbidden acts to the person of the freshly characterized homosexual. Foucault located this transposition in Carl F. Westphal's article on "contrary sexual sensations" in 1870, which offers an attempt to medicalize homosexuality. This change marked the transformation of a category for a set of illegal acts, sodomy, to a category for a type of person, the homosexual. In Foucault's words, "[t]he nineteenth-century homosexual became a personage, a past, a case history, and a childhood, in addition to being a type of life, a life form, and a morphology, with an indiscreet anatomy and possibly a mysterious physiology" (Hacking 2002a, 105).

Two aspects of the medicalization of both homosexuality and other forms of deviant sexuality became a part of its conceptual matrix.[18] First, formerly unlawful sexualities began to be seen as pathological, conceived under a category for a type of human being and studied under the technologies of health. Second, the very study of these pathological sexualities provided a rationale for their continued pathologization. Once the medical shift was made, deviant sexualities were identified in the bodies of the deviant "as a lesion, a dysfunction, or a symptom—in the depths of the organism, or on the surface of the skin, or among all the signs of behavior" (Foucault and Gordon 1980, 44).

The shift in medical views on homosexuality gave rise to a series of discourses on the diverse species and subspecies of homosexuality and other forms of deviant sexualities, making possible their social control. Foucault called this biopower, or the "normalization of the deviant" by means of the regulation of the births, deaths, reproduction, and illnesses of populations.[19] The generation of the discourses on and the regulation of deviant sexualities took place within diverse social institutions, most remarkably the penitentiary system, psychiatric hospitals, schools, and the family. Heinrich Kaan's *Psychopathia Sexualis* (Kaan and Heyness 2017), according to Foucault, juxtaposed an "orthopedics" of sex with an earlier analysis of heredity and an associated sense of "biological responsibility." Sex must be controlled for the sake of protecting not only the deviant but also his descendants from transmitting the associated perversions and diseases. In Foucault's view, "[t]he medicine of perversions and the programs of eugenics were the two great innovations in the technology

[18] Considering that the notions of medicalization and pathologization may be understood in different manners, it is worth clarifying the sense in which I use them in this work. By the term 'medicalization' I understand the treatment of a given phenomenon as a medical condition. Some of these conditions may have, previous to its medicalization, been treated as religious, moral or more generally as social issues. By pathologization I understand the postulation of a disease entity, an organic pathology, as an underlying correlate to a given condition or behavior. I used both terms interchangeably to the extent that the medical treatment of a condition or behavior may explicitly or implicitly assume the presence of an underlying organic pathology in its understanding of such condition or behavior.

[19] "A visible continuity, therefore, but one that did not prevent a major transformation: from that time on, the technology of sex was ordered in relation to the medical institution, the exigency of normality, and – instead of the question of death and everlasting punishment – the problem of life and illness. The flesh was brought down to the level of the organism" (Foucault 1990, 117).

of sex of the second half of the nineteenth century" (Foucault and Gordon 1980, 118). Moreover, the orthopedic and hereditarian approaches, merged together with the even more comprehensive degeneracy program, formed the solid nucleus of "perversion-heredity-degenerenscence."

The discourses on deviant sexuality, their associated technologies of normalization, and their implementation in diverse social institutions also afforded a space for the formation of a counter-discourse. Homosexual men broke their silence and spoke on their own behalf; their slogan "silence equals death," invoked during the 1980s AIDS epidemic, dramatically captured this turn. Homosexual men began to demand the acknowledgment of both the legitimacy and "naturality" of their sexuality, appropriating the medical vocabulary generally used to disqualify it.

In addition to the homosexual movement, Foucault pointed to the women's liberation movement as a discursive counterbalance to contemporary normalizing technologies and discourses. According to Foucault, the strength of these two movements primarily came not from the reclamation of their sexual practices as such, but from appropriation of the very discourses and institutions (what Foucault called the "apparatuses of sexuality") that they opposed, and in the process, they legitimized homosexuals as a type of person. Both movements' demands for sexual specificity resulted in a de-sexualization of discourse, displacing its focus from specific sexual behaviors to ways of being. In so doing, they achieved the recognition of "forms of culture, discourse, language, and so on, which are no longer part of that rigid assignation and pinning-down to their sex which they had initially in some sense been politically obliged to accept in order to make themselves heard" (Foucault and Gordon 1980, 220).

Although Hacking himself referenced the homosexual movement only briefly, the case of homosexuality is paradigmatic of the looping effect. Remarkably, the looping effect does not merely result from the self-awareness of an individual. It also occurs in the *collective*

action of appropriating and transforming the meaning of a category of person, a category that has been legitimized by a scientific discourse and implemented within social institutions.

If we understand homosexuality merely as the practice of men and women having sexual relations with the same gender, the significance of the looping effect is lost. However, if we understand homosexuality as a more robust concept involving a kind of pathological sexual desire, then the historical consequences of the social response to homosexuality are evident. When homosexuality was defined in that manner, those classified organized around the notion that their desires were not, in fact, pathological. They were able to bring their lifestyle into the open by legitimating it through social and political action. Eventually, this reshaped the scientific understanding such that the notion of homosexuality was no longer viewed as a pathological type. The kind of looping mentioned here was dependent on the characterization of homosexuality as pathological by the scientific and medical community.[20]

2.1.2. Criminality.

Hacking examines the case of criminal behavior in his article “Degeneracy, Criminal Behavior, and Looping,” included in *Genetics and Criminal Behavior* (Hacking 2001b). Crimes and criminals, Hacking notes, are of the oldest themes to be systematically studied suggesting the existence of a type of person – the criminal. The roots of the “scientific” view of the criminal extend back to the origins of the social sciences, which, Hacking argues,

[20] In a comment to this work Prof. Tsou noted that the case of homosexuality might not illustrate the looping effect as clearly as I suggest in this section, since " If homosexuality is understood as individuals who engage in same-sex practices, the classification has arguably remained the same". This considered, he notes it might be more appropriate to discuss this case in terms of "the medicalization and then de-medicalization" of homosexuality. My understanding of the notion of Hacking's account of kinds of people is more robust that what is suggested in the understanding of homosexuality suggested in Tsou's observation. I take the case of homosexuality to be particularly remarkable because it shows the active role of people as social actors in responding to the introduction of a scientific or medical taxonomy and the pathologization of what they deem as a rightful mode of being. Through such active engagement the meaning of the notion of homosexuality was transformed, opening new possibilities of being (a kind of person). Tsou's observation, however, does raise some question concerning the scope of the looping effect, since the result of the transformation of the notion of homosexuality was not contained within the confines of scientific/medical category. I am inclined to the view that the notion of the looping effect could serve as a heuristic of analyses of scientific categories of people, but does not limit to them, bridging between the scientific and the cultural.

began “by counting and classifying crimes, criminals, types of crimes, and rates of conviction, and recidivism,” alongside the study of suicide. By 1820, statistical laws about crimes were abundant.[21]

Hacking points in particular to Charles Gorgin’s 460-page statistical study, published in 1913, which posited a notion of criminality that remained paradigmatic within scientific discourse well into the twentieth century. In *The English Convict* (Gorgin 1913), Gorgin presented a typology of “the criminal”—a type of man—based on physical constitution (e.g., skin colors, height, hair texture), mental constitution (e.g., temperament, intelligence, mental defects), and other “etiological” influences (e.g., nationality, employment, family life, alcoholism, social class). Gorgin intended to establish that 1) convicts are characterized by a poor health condition (e.g., weaker and smaller, less intelligent), which differentiates them from non-convicts; 2) there is a significant correlation between parental and filial criminality; 3) every adult is susceptible to committing crimes; and 4) the “degree of susceptibility is normally distributed in the population, and is strictly heritable, in the broad sense” (Hacking 2001b, 149).

Gorgin’s most influential assumption was that criminality, like other heritable diseases, runs in families. By 1900, Karl Pearson, an early eugenicist and biostatistician, following in Gorgin’s footsteps, had found that heritable diseases, such as tuberculosis, follow a normal distribution—a distribution also followed by criminality. Pearson later on went on to study intelligence in “the convict.” He introduced the idea that rather than a defect in intelligence, what characterized the criminal was his “social ineffectiveness” or lack of “social or moral responsibility”—a trait Pearson also thought to be heritable (Hacking 2001, 150-151). Criminal behavior thereby became the area of expertise of the criminologist,

[21] At this point the MUP project and the Styles project intersect. Chapter 3 elaborates on the emergence of the statistical style. The statistical study of criminality during the early 1800s was one of the first of their kind (Hacking 2001b, 143).

psychologist, sociologist, statistician, and, later, the biologist, and not merely a matter for the police, lawyers, and prisons.

Echoing Foucault's analysis of homosexuality, Hacking noted that the scientific view of "the criminal" – as kind of person – that emerged during the eighteenth and early nineteenth centuries merged with the larger framework provided by the degeneracy program. Other sets of "deviant" human behaviors also were included, including hysteria, epilepsy, madness, mental retardation, suicide, prostitution, and vagrancy. The degeneracy program conceived of all these as both interrelated and hereditary (Hacking 2001, 144). Although some of its assumptions have been abandoned—such as the idea that homosexuality would appear in one generation, alcoholism in the next, and mental retardation in the next—Hacking suggests that the degeneracy program still exists, if in a mitigated version (Hacking 2001, 147).[22]

The case of criminality does not fully illustrate Hacking's notion of the looping effect, although it does show how introducing new ways of thinking within scientific discourse transformed the target of study. As in the case of homosexuality, the key step in such transformations is found in the switch from focusing on criminal behaviors to focusing on the criminal himself. This switch was made possible by the emergence of first statistical and then hereditary (though not yet genetic) thinking. Assessing whether there has been a looping

[22] Although Hacking does not elaborate substantively on the notion of degeneration, he suggests it as a common thread in some of his case studies on making up people (remarkably, the cases of homosexuality and criminality). Although it may be a long stretch from the degeneracy program to current views on criminality as psychopathy or antisocial personality, the degeneracy program appears to have impacted the early developments in the scientific understanding on mental illness, psychopathy, criminality among other notions. Hacking suggests that contemporary scientific understandings of psychopathology might be able to be genealogically traced back to the "Degeneracy Model" of the 19th century identified by Daniel Pick (Pick 1989). The degeneracy model provided the space for and was reinforced by the proliferation of statistical studies and the biologization of various social anxieties often exacerbated by increasingly urban lifestyles, such as concerns over crime, hysteria and alcoholism. Social Darwinism, alongside Mendelian notions of inheritance, informed the concerns and approaches of social scientists and policy makers who sought to fix or alleviate the social ills associated with "degeneracy". While current understandings of psychopathology differ greatly from those held by the 19th century advocates of the degeneracy model, concerns over inheritance of these conditions continue to this day, not to mention anxieties over the need to protect society from the mentally ill through psychiatric institutions and legal interventions.

effect of the sort envisioned by Hacking falls beyond the scope of this work. However, it is not unreasonable to posit that during the late 1800s and early 1900s, prison reform movements motivate a looping effect in the category of "the criminal." Several organizations have long advocated against prisoner mistreatment and fought for the improvement in their life conditions and the defense of their rights. The ways in which the actions of these organizations have impacted the scientific views of "the criminal" is unclear at this moment; however, it is a fascinating path for additional inquiry.

2.1.3. Child Abuse

Hacking elaborates on the case of child abuse in several pieces (Hacking 1988e, 1991b, 1992a, 1995a, 1999). Mistreatment of children has been recorded since ancient times. However, Hacking argues that the contemporary concept of child abuse came into being in 1962, with an X-ray-driven study of how bones heal in toddlers. This moved abuse from a legal to a medical focus. Two legal notions preceded the medicalization of child abuse: "cruelty to children" and "neglect." Such children became the cause of such philanthropic societies as the New York´s Society for the Prevention of Cruelty to Children, and inspired the foundation of the Children's Bureau in 1912. Nonetheless, children who were victims of cruelty or neglect were not conceived of as distinct kinds of persons; they received the same medical treatment as victims of any other injury. The mid-twentieth-century shift from the legal conception of cruelty toward children to the medical conception of child abuse was driven by the identification of a type of child who presented with what came to be called the "battered child syndrome." This was a condition characterized by the presence of healing bones in the absence of current fractures or other trauma. Denver pediatricians presented their findings on battered child syndrome in the *Journal of the American Medical Association* in 1962.

The change of conception brought attention not only to the children with battered child syndrome, but also to the "sick" adults, presumably their parents, who abused them. A

series of features became associated with the phenomenon of child abuse. Rather than being the product of a certain social class, child abuse is found in the constitutions of abused and abusers; child abusers are likely to have been abused children themselves; and the study of child abuse belongs to the medical profession.

Since 1962, the medical view of child abuse has undergone a series of radical changes resulting in the extension of its domain. Cases not initially considered as child abuse are now included under its purview: in addition to physically and sexually abused children, those who were not given the proper care to promote “optimal development” also require attention. This extension is reflected in the increased cases of child abuse. In 1967-68, 7,000 cases of abused children were reported in the United States’ first abuse survey. Fifteen years later, 1.2 million instances were reported to the National Center for Child Abuse and Neglect, only 69,000 of which were cases of physical abuse or neglect (Hacking 1991a, 58-59).

Such a dramatic change has been both the source and the product of the interaction between classifications, their application through institutions, and the changes they bring about in the behavior and experiences of the people they classify. Hacking argues: “We have found out more about child abuse, not just by uncovering horrible facts but also by clarifying our ideas and sharpening our moral sensibilities.” Moreover, as the conception of child abuse has evolved, people have also changed: “Children experience their hurt differently. […] Likewise the abusers' own sense of what they are doing, how they do it, and even what they do is just not the same now as it was thirty years ago¨ (Hacking 1992a, 254).

Several actors have been involved in the formation and articulation of the category of child abuse. From its original location in the legal system, the field of social work, and charitable and philanthropic associations, it has moved to the clinical and medical professions, schools, and society at large via media coverage. Strategies for the protection of abused children and the prevention of child abuse have been implemented in all of those settings. In turn, the dissemination of the knowledge about child abuse has made space for the creation of “Parent Anonymous” groups and a generalized awareness of the agencies in

place for “reporting” child abusers (Hacking 1988e, 61). The reinterpretation of the experiences of those who were once abused children has turned out to be both cathartic and liberating, transforming not only the past but also the present lives of those involved. The flip side of the story is played out in groups of pedophiles; they also have found room in print for expressing their own views, siding with their own “courageous group of ‘experts’” who argue that there is a diversity of types of relationships, and that not all adult-child relations are damaging for the children and require intervention (Hacking 1999, 142).

The case of child abuse illustrates both ends of the looping effect: the ways in which scientific thinking brings about a conception of a type of being—abused children—and the ways in which the experiences, behavior, and treatment of the children so classified changes in response to the implementation of such a view. Additionally, it illustrates how the category of “abused children” directly and indirectly affects the people so classified. On one hand, the knowledge associated with child abuse may provide a framework of reference for making sense of certain experiences, past and present (e.g., apparent irrational fears, sadness, stress response, etc.). On the other hand, the recognition of a category of person (such as an abused child) may also motivate the creation of organizations around such an identity, which in turn may transform the category that brings them together.

2.1.4. Fugue

In his book *Mad Travelers: Reflections on the Reality of Transient Mental Illnesses* (Hacking 1998), Hacking elaborates in detail on another of his MUP analyses, the case of fugue. Fugue is a presumed disorder characterized by “strange and unexpected trips, often in states of obscured consciousness”. It entered the medical taxonomy of insanity by 1887, originally in Bordeaux, France, and then in Italy, Germany, and Russia. Hacking focused primarily on the story of the first fugueur, Albert, and his doctor, Philippe Tissié (1852-1935), who opened “the possibility of fugue as a diagnosis in its own right” through their doctor-

patient interactions. These interactions served as an “an exemplar for thinking about a whole group of mental illnesses, past and present” (Hacking 1998, 31).

Between 1888 and 1895, the fugue epidemic inaugurated by Albert and Tissié came to be assimilated into the two “great but mysterious mental pathologies of the day,” hysteria and epilepsy. The assimilation initially took the form of a debate between one group of experts who associated fugue with hysteria, conceived of as a “psychogenic” condition, and another group who associated fugue with epilepsy, which at that time was believed to be the result of a brain injury. Jean-Martin Charcot, one of the most influential neurologists of the time, advanced the revolutionary claim that both women and men exhibited hysteria (in opposition to the contemporary view that hysteria was gender-specific, affecting only women and “effeminate men”). Because of Charcot’s work, the conception of hysteria was extrapolated from its gynecological and obstetric background, and increasingly conceived of as also affecting “burly laborers.” However, although Charcot believed certain individuals were predisposed to the condition due to their lineage, he advanced a fundamentally different etiology for male and female hysteria: he cited moral triggers for women; but for men, he blamed physical trauma, shock at a very early age, or industrial or alcoholic poisoning (Hacking 1998, 32-33).

As the conception of trauma transformed from physical to psychical (today’s view, and one that was suggested but not embraced by Charcot), so grew the debate over whether psychogenic hysteria or physiogenic epilepsy was the source of fugue. Moreover, a similar transformation of the conception of epilepsy also took place, which in turn heightened the debate even further. Later on, a third theory of fugue as a type of “neurasthenia,” a condition of the nerves, was added to the debate. Neurasthenia supporters did not necessarily reject the other two classes, but rather added the third as a distinct type of fugue.

The hysteria, epilepsy, and neurasthenia frameworks all shared the view that fugue ran in families. Neurasthenia was more descriptive than theoretical, while hysteria and epilepsy provided the theoretical space for describing fugue as a medical condition. However,

all three conceptions were subsumed under the even larger theoretical space of the degeneracy program. As Hacking points out, “[d]egeneracy was deeply implicated in both hysteria and epilepsy. Doctors, novelists, and the population at large imagined that when hysteria showed in one generation, epilepsy might show in the next, exemplifying the terrible prospect of racial degeneration” (Hacking 1998, 35).

Hacking then describes the conciliatory view that emerged in 1895, promoted by Fulgence Raymond. Raymond claimed that whereas some cases of fugues were epileptic, the great majority were hysterical—but that it was not necessary to exclude one view in favor of the other. Moreover, Raymond also suggested that a person could have two subtypes of fugue at once, as long as the fugue demonstrated three characteristics: an “irresistible compulsion to travel,” acting “intelligently, in a regular and apparently normal way, without violence,” and amnesia (Hacking 1998, 47). Raymond distinguished hysteric and epileptic fugues from neurasthenic fugues depending on whether or not amnesia presented. The presence of amnesia, in his view, indicated the presence of trauma (both psychical and physical). In contrast, neurasthenic fugues were not characterized by trauma. Furthermore, and in line with Charcot, Raymond differentiated epileptic from hysteric fugues on the basis of the response to potassium bromide (as suggested by Charcot), a medication widely used by the psychiatrists of the time to treat epilepsy, hypnotic therapy, whose purpose was to retrieve the forgotten memories of what took place before and during the compulsive wandering (Hacking 1998, 49).

Hysteria and epilepsy were only two of the elements precipitating the emergence of fugue in the late 1880s. The beginnings of mass tourism, the criminalization of vagrancy, the degeneracy program, the French system of conscription/control of desertion, and the transformation of the conception of trauma from the physical to the mental each played a role in creating the space for the mad to become a kind of person. Hacking points out that an “exceptional combination of circumstances,” what he calls an ecological niche, is required “for any particular species to emerge in a habitat” (Hacking 1998, 55). Extrapolating from this

biological metaphor, he claims that in order for a kind of person to come into being, a combination of exceptional circumstances also must be in place. He calls us to "[enlarge] our view to the niche in which fugue thrives as a kind of madness" and look for "new environments where fugue is found and similar environments where fugue is not found" (Hacking 1998, 56). To illustrate, Hacking considers the case of runaway slaves in the United States in the mid-1880s. This phenomenon gave rise to a short-lived diagnosis established by an appointed commission for the study of the (so-then-called) "Negro race." The commission came up with the label "Drapetomania," whose Greek root means "to run away," to identify the presumed insanity of the slaves who had a tendency to escape their masters.

The emergence of multiple personality as a kind of people provides another illustration of the ecological niche. Multiple personality, like fugue, was characterized by amnesia and an associated loss of a sense of identity. Like fugueurs (sic., Hacking 1998, 90), multiples had no recollection of their whereabouts under one or more of their alternate identities, and they underwent hypnosis in order to bring back their memories. Fugue, which emphasized a different set of symptoms, did not become a diagnosis in the United States; but multiple personality did, and some of the multiples in the United States had been qualified as fugueurs in France. This suggests that what counts as a legitimate kind of person at a given point in time and space depends upon a diversity of conditions, which create a socio-epistemic space for the categories to emerge.

The fugue epidemic lasted twenty-two years, beginning in 1887 and ending with the 1909 presentation of "last fugueur" at a major public event in France. Being identified as an hysteric or epileptic condition initially helped fugue be accepted as a legitimate psychiatric classification. However, it also ultimately led to fugue's rejection as a medical condition, since over time hysteria ceased to be recognized as medically legitimate and epilepsy was reconceptualized as a condition under which fugue no longer fit. Hacking points to the

disappearance of hysteria—a vital element of fugue's ecological niche—as one key aspect in the extinction of fuguers.[23]

2.1. 5. Multiple Personality

A third example of MUP is multiple personality disorder. Hacking has dedicated a complete book, *Rewriting the Soul* (Hacking 1995a), to this topic. The narrative of multiple personality disorder overlaps with the narratives of child abuse and fugue, and, like the case of homosexuality, provides an almost perfect example of the looping effect. Most of the elements Hacking considers in his analytic framework for the analysis of MUP are exhibited in the case of multiple personality, including the underlying but key philosophical notions I explore in the next section.[24]

Although cases of people with double consciousness have been reported since at least 1791, Hacking argues that multiple personality as a kind of person did not emerge until 1980, the year in which the American Psychiatric Association recognized it as an official diagnosis in the DSM III. In the 50 years prior to 1980, only 12 cases were documented, but by 1982, psychiatrists were referring to multiple personality disorder as an exponentially growing epidemic. By 1986, six thousand people had been diagnosed, and by 1992, "there were hundreds of multiples in treatment in every sizable town in North America" (Hacking 1995a, 8). The American Psychiatric Association voted to change the name of the disorder, and "multiple personality" as an official diagnosis was discontinued with the 1994 publication

[23] It is worth mentioning that Hacking's notion of ecological niche is akin to his proposal of the 5-vector analytic framework, of which I shall say more later on. It's interesting to note that looping effects do not clearly play a role the rejection of the category of fugue. I thank Prof. Tsou for bringing this point to my attention.

[24] These includes the notions of "actions under a description", prototypes, causal knowledge, ecological niche, and transient mental illness.

of the DSM IV, which re-identified it under the broader category of "dissociative identity disorder."[25]

Hacking illustrates multiple personality first by using the description established in the DSM III, and then by providing an example (an “exemplar”) of someone with this disorder.[26] The DSM III’s category includes three items:

i) The existence within the individual of two or more distinct personalities each of which is dominant at a particular time, ii) the personality that is dominant at any particular time determines the individual’s behavior, and iii) each individual personality is complex and integrated with its own unique behavior pattern and social relationships (Hacking 1995a, 10).

Hacking’s exemplar of multiple personality is Sybil, a woman identified as a multiple with 16 distinct personalities. Sybil’s doctor, Cornelia Wilbur, was one of the leading figures who defended multiple personality as a genuine category. Like the mad travelers of the late 1800s, Sybil would wake up without knowledge of her whereabouts in the antecedent hours or days, although she was aware that she had been in places that she could not remember. Before submitting to Wilbur, who identified her as a multiple, Sybil had been diagnosed with other conditions like anxiety and depression. Unlike previous doctors, Wilbur was aware of multiple personality disorder and in the interaction with her patient, was able to identify the different personalities inhabiting Sybil. As Sybil reassembled and recalled recent episodes in her life, memories of childhood abuse also came back in flashes. By corroborating the evidence of the stories Sybil narrated to her, Wilbur’s work strengthened the view of multiple personality as a mechanism originated to cope with the painful experiences of sexual abuse suffered as a child: when the violence is too traumatic for the host, a new alter ego emerges and take over.

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[25] Here I use “multiple personality disorder” insofar as Hacking’s case concerns such a short-lived diagnosis. Multiple personality is an instance of what Hacking identifies as “transient mental illness”, which is discussed later in this chapter.

[26] It is worth noting that he does the latter while emphasizing in an apologetic manner that what is at play are the lives and experiences, too many of which are very painful, of the people who serve as exemplars.

Wilbur prescribed therapy to uncover the source for the diverse alters, promote awareness of the diverse selves, and reinterpret those experiences. In her model, the distinct selves of a multiple can fit two general forms: they can be found out to be frozen in time and remain children within the bodies of their adult hosts, and they can be brought out as grown-ups when their host experiences situations similar to those which first brought them about. Sybil's alters took both forms.

According to Hacking, Sybil's case played two key roles in how the category of multiple personality was shaped. It promoted the dissemination of those associations to a general audience. Sybil's story has been presented in a best-seller novel written by Flora Rheta Schreiber,and a film directed by Daniel Petrie (Petrie 1976). It also established some basic knowledge that then became associated with the category. Besides its association with sexual childhood abuse, Sybil's story established multiple personality disorder's gender-specificity (i.e., most multiples were female) as well as a general prototype:

> [A] middle-class white woman with the values and expectations of her social group. She is in her thirties, and she has quite a large number of distinct alters—sixteen, say. She spent a large part of her life denying the very existence of these alters. The alters include children, persecutors, and helpers, and at least one male alter. She was sexually abused on many occasions by a trusted man in her family when she was very young. She has suffered many other indignities from people from whom she needs love. The needs are, among other things, part of her class values, which may be abetted or taken advantage of by her abuser. She has previously been through parts of the mental health system and has been diagnosed with many complaints, but her treatments have not helped her in the long run until she came to a clinician sensitive to multiple personality. She has amnesia for parts of her past. She has the experience of "coming to" in a strange situation with no idea of how she got there. She is severely depressed and has quite often thought about suicide. (Hacking 1995a, 33).

All the elements included in this prototype are not to be taken as necessary and sufficient conditions of multiplicity; some multiples may exhibit some but not others, and most multiples will exhibit many.

Another key aspect in the stabilization of multiple personality as a kind of person was the creation of a language for the describing the signs and experiences of these persons.

Once the terminology and associated description of multiple personality were in place, the category progressively became standardized among both experts (who studied it) and laypeople (who in some way or another are related to the classification, e.g., family, friends). The jargon established for the condition—including "switching," "alter," "personality fragment," "coming out," "going to another place," and even the use of the plurals "we" and "our" as self-referencing pronouns (i.e., rather than "I", "my", or "me")—was shared by all those versed in or affected by it and differed from ordinary uses of these words (Hacking 1995a, 236).

In addition, the formation of self-help groups, with the help of non-multiple facilitators, and the attention they received in the media, particularly television, also greatly contributed to the establishment of the short-lived category. Debbie Davis, a multiple and a member of the International Society for the Study of Multiple Personality, formed the Multiple Personality Consortium in the early 1990s. She organized diverse gatherings where members told their stories and participated in activities promoting the emergence of childhood alters.

Disagreements among the communities of experts and practitioners regarding both the definition and characterization of multiple personality soon emerged. The first critique reflected a more comprehensive opposition that questioned the very adequacy of psychiatric categories. One side of the debate viewed psychiatric categories as collections of symptoms; the other side characterized these categories on the basis of necessary and sufficient conditions (generally expected to be established in terms of biological causes). In the case of multiple personality, this was a debate between people who accepted Hacking's prototype and people who believed that the identification of child abuse was a necessary condition for the disorder.[27]

[27] It is worth emphasizing that Hacking himself does not reject underlying biological causal mechanisms. Both hypotheses accept the association between child abuse and multiple personality disorder. They also accept a putative (unspecified) underlying psychobiological correlate, which is suggested on the basis of lab rats exhibiting depletion of important brain neurotransmitters when exposed to repetitive electric shocks (i.e., an animal model of trauma).

The second type of disagreement was about the characterization of multiple personality itself, specifically the description of the alters identified in a multiple. Some conceived of them as distinct personalities, in which case one could say that many persons inhabit the body of their host; others believed that alters are disconnected fragments of the personality of single person, in which case one could say that the self of a single person is fragmented. These two contrasting ways of conceiving multiplicity were reflected in both the name of and treatment favored for the condition. “Multiple personality disorder” reflected the idea that multiple persons inhabited the same body; “identity disassociation disorder” emphasized the view that multiplicity was a problem of broken identity rather than personhood. Accordingly, when conceived of as multiple personality, the associated intervention consisted of facilitating the space for the different alters to come out. Proponents of identity dissociation, however, suggested that the host dissolve those fragments by integrating them as mere phases of herself.

These alternative strategies for intervention that Hacking considers were mutually exclusive. One encouraged the person identified as a multiple to recognize the different personalities within her and relate her experiences to the experiences of the other alters, with the ultimate goal of unifying the fragmented experiences. The other promoted the dissolution of the alters by denying that their reality and experiences are different from those of the multiple herself. The multiple was prohibited from talking about her experiences in the third person (i.e., as an alter), and thereby was encouraged to accept the expression of traumatic or hard-to-acknowledge experiences as her own.

The debate over the name was officially resolved with the revision of the category in DSM IV, but the debate over the characterization of the condition and its strategies for intervention has not yet been resolved. Along these lines, Hacking states:

The name change, from multiple personality disorder to dissociative identity disorder, does matter. A few years ago professionals were advising that one should never, in therapy, eliminate a single alter personality, for that would be akin to murder. Now the message is, get

rid of the personalities altogether. Dissociation has become the name of the game, of the disorder, of the journal, and of the organization (Hacking 1995a, 53).

The disagreements over multiple personality were not limited to whether it is constituted of identity fragments of a single self or of multiple persons inhabiting one body. Some other aspects of the characterization, including the most well-established (i.e., its association with child abuse and females) were also contested, and some multiples and their supporters, such as Debbie Davis' group, were uneasy with the very characterization of multiplicity as a disorder, regardless of how the notion was construed.

2.2. Complementary Notions

In addition to his case studies, Hacking has introduced a set of philosophically relevant notions that clarify his conceptual analysis of categories of people. These notions, introduced before Hacking had schematized his MUP project (see Section 3), both enrich and constitute a precursor of the proposal. Four are particularly significant: 1) the notion of an "action under a description," which provides a background to the notion of the looping effect; 2) the notion of "causal knowledge" as it relates to the notion of "prototypes"; 3) the notion of an "ecological niche," which highlights the centrality of context for the analysis of the emergence of kinds of people; and 4) the notion of a "transient mental illness," which highlights both the interdependence between knowledge and ontology as well as the ontological implications of the fallibility of our knowledge about kinds of people. In this section, I make explicit these notions and link them to the analytic framework.

2.2.1. Action Under Description

Hacking's analysis of the emergence and decline of multiple personality disorder includes theoretical and contextual considerations as well as a phenomenological component (i.e., a component concerning the subjective experience of the people diagnosed with MPD). It suggests that the knowledge advanced about multiple personality, legitimized in the DSM III

and implemented in diverse settings ranging from the medical establishment to the media, transformed the ways in which the people who are described as multiples came to see themselves as being of a kind. This transformative aspect of the proposal is central to Hacking's view of MUP, particularly as it relates to the role of the looping effect, and it reveals the rationale for limiting the application of the looping effect solely to human beings.

In clarifying the role played by the phenomenological aspect in the looping effect characteristic of MUP, Hacking borrows from G.E.M. Anscombe's characterization of "intentional actions" as "actions under a description" (Anscombe 1957). According to Anscombe, intentional actions understood as actions under a description are only one of three different forms by which intention can be understood (the other two forms are "intention to act" and "intention in acting"). Anscombe rejected the view that intentionality can only be attributed to an agent if one has access to his mental content, regardless of his actions. Rather, she believed that intentional actions answer the question of why in terms of "reason-giving"—i.e., the agent who performs an intentional act has knowledge of what she is doing and has some non-observational causal knowledge of the action she performs.[28] For example, suppose that an agent "Albert" gives up drinking cow's milk. In Anscombe's account, such an action is intentional if, when questioned, Albert both knows that he stopped drinking milk and has some non-observational, causal knowledge as to why he did so, e.g., he realized that he is lactose-intolerant or he disagrees with the mistreatment of cows on dairy farms.

Anscombe acknowledged that there are many instances of non-observational causal knowledge that are involuntary (and thus non-intentional), such as "bodily movements like the peristaltic movement of the gut" (Anscombe 1957, 8). However, the sort of non-observational

[28] Anscombe would have disagreed, for instance, with the view that the only way to attribute the intention of, say, improving our skill at playing guitar is by expressing such intentions. Although it is the case that some intentions are never realized (e.g., one may never learn to play the guitar, even if one has the intention), a great deal of intentions are; the former correspond to what she calls "intention to act," while the latter are identified as "intentional actions" (Anscombe 1957, §4-5).

causal knowledge involved in intentional action can be expressed in terms of reason, rather than in terms of mere physical evidence. To put it succinctly, neither theoretical nor evidential knowledge of an event count as the sort of causal knowledge required for intentional action on their own; these bring about intentional actions only in cases where they provide a rationale for action, i.e., reason-giving. Thus, Anscombe is able to exclude involuntary events such as bodily movements from her definition. This understanding of intentional action as action under a description is in agreement with Hacking's use of Goodman's notion of relevant kinds in characterizing kinds of people. Like Goodman, Anscombe rejects that there is “a fundamental description” that accounts intentional action at a lower level of scientific description, such as a complex description of motor control or a molecular description. In her view “the only events to consider are intentional actions themselves, and to call an action intentional is to say it is intentional under some description that we give (or could give) of it” (Anscombe 1957, §19). Just like there is not an essential or fundamental basis for classification in Goodman's account, there is no essential or fundamental basis for intentional action in Anscombe's account.

Borrowing from Anscombe’s theory of intentional action, Hacking claims that in order for looping to occur, the agents involved must have knowledge of the performed action and some non-observational causal knowledge for acting in such a way. As the case of multiple personality disorder shows, the formation and legitimization in theory and practice by the pertinent experts of a given kind of person help provide the non-observational causal knowledge that serves as a rationale for action. If no such description is available, no change in the experience of people follows, and no looping takes place. Once the terminology and associated description of a given condition are in place, it progressively becomes standardized among the experts who study it and the laypeople who relate to the classification in some way (e.g., family, friends, patients). The new language introduced with the taxonomy of a condition allows the practitioner to identify the condition, the expert to study it further, and the people who are diagnosed with the condition to make sense of their

experience and act accordingly—even if this is only through the ways in which they are treated.[29]

2.2.2. Causal Knowledge and Prototypes

In the human sciences, there is a lack of definitive knowledge about kinds of people. Despite this, Hacking conceives of such knowledge as causal. Such a view is at odds with both the commonsense understanding of causality and a very influential philosophical view that conceives of causality in terms of necessary and sufficient conditions. Causality, as previously noted, is part of a problematic family of terms that have been accounted for in terms of each other and which have been contested since at least Hume. Other members of this problematic family include kinds, laws of nature, and counterfactuals, as noted in Goodman's *Fact, Fiction and Forecast* (Goodman 1954). Along with rejecting natural kinds, and essential kinds more generally understood in terms of necessary and sufficient conditions,[30] Hacking also rejects one such view regarding causal knowledge about kinds of people. Particularly in chapters 6 and 7 of *Rewriting the Soul*, Hacking links this rejection to the prototype theory of concepts (Lakoff 1987). In this section, I elaborate on the notion of causal knowledge regarding kinds of people suggested by Hacking, highlighting the role played by prototypes in such a view.

Hacking uses the case of multiple personality disorder to illustrate his discussion of causal knowledge about kinds of people. He begins by presenting a taxonomy of types of causal knowledge, highlighting the distinction between a definitional account of causal knowledge, which emphasizes necessary and sufficient conditions, and a more relaxed view emphasizing prototypes. According to the classical view of the philosophy of science, "statements of individual causes are warranted only when there is a general causal statement

[29] The knowledge established in a prototype for a given condition provides such knowledge.
[30] Hacking's treatment of natural kinds is found in Hacking (1991d). Although Hacking rejects an essentialist treatment of natural kinds, he is more sympathetic to other accounts, remarkably, Richard Boyd's view in terms of cluster properties.

in the background" (Hacking 1995a, 81). Hempel upheld this view, for example, on the elliptical character of causal explanation, which he conceived of as ultimately dependent on theoretical explanations (Hempel and Oppenheim 1948).

In Hempel's model, the general statements required to account for event causation are natural laws, i.e., statements of a general form which are true, universal, and unlimited in scope. Hacking roughly agrees with the traditional view in so far as event causation can only be understood in terms of some background knowledge of a general sort. But he does not believe that general statements required to account for causal knowledge of events (and in general) must be conceived of as "strict universals." He is more sympathetic to (although ultimately rejects as inadequate) the view that general background knowledge is a "fairly necessary condition" for causal claims (a notion introduced by Hacking). While the strict generalizations view holds that "whenever there is an event of kind K, then there results an event or condition of kind J," the fairly necessary conditions view holds that "[w]ithout events or conditions of kind K, events or conditions kind J are unlikely to occur" (Hacking 1995a, 82).

In the history of psychiatry, Hacking observes, the etiology of a condition has often been created in the weakest possible way: by calling upon fairly-necessary-conditions. This is exemplified by the etiology of multiple personality disorder: "[w]ithout severe and repeated childhood trauma, typically of a sexual sort, multiple personality is not likely to appear" (Hacking 1995a, 82). The etiology of the fairly-necessary-conditions view of multiple personality disorder, understood as a "post-traumatic dissociative disorder of childhood onset," nonetheless has evolved side by side with the very characterization of the condition (Hacking 1995a, 82). One must be cautious since the fairly-necessary-conditions view suggests that the definition of the condition (i.e., the statement of the fairly-necessary-conditions view) antecedes the search for a cause; for instance, the characterization of multiple personality antecedes the search for its cause (e.g., childhood trauma). But neither a childhood onset nor the presence of trauma is a necessary element in the background

generalization. These two items of knowledge, in Hacking's view, are simply parts of the authors' understanding of multiple personality disorder, or what he identifies as its prototype.

Hacking believes that the background knowledge required in causal claims is better understood as a prototype than as a definition. Not all abused children become multiples, and not all multiples have been subjected to child abuse. Nonetheless, the observation that "without severe and repeated childhood trauma, typically of a sexual sort, multiple personality is not likely to appear" provides crucial knowledge about the condition, which helps experts and laypeople to both make sense of and deal with it. In other words, the description associated with MPD, conceived of as a prototype, plays a heuristic role for diverse purposes, including but not limited to the explanation, prediction, and identification of the condition. It provides a reference point, a "best example" against which one may look further into practice for subsequent inquiry and intervention. "[I]f you were giving a best example of a multiple," Hacking states, "you would include child abuse as one feature of the example" (Hacking 1995a, 83). Prototypes play a causal role by providing a heuristic guide for dealing with experience; they allow and facilitate the identification, treatment, and subsequent study of kinds of person.

Hacking has not thoroughly elaborated a view on prototypes and their role; however, he does point to the work of at least two philosophers and a linguist—namely, Wittgenstein, Putnam, and Lakoff (Wittgenstein 1997, Putnam 1975, and Lakoff 1987). In his book *Women, Fire and Other Dangerous Things*, Lakoff claimed that the prototype effects of concepts are best understood in terms of cognitive models. Lakoff contested the folk view of categories, according to which concepts are defined in terms of a basic set of common properties (in philosophical parlance, necessary and sufficient conditions). Lakoff, in turn, cites Wittgenstein, who used the "game" concept to illustrate his theory of family resemblances.

Wittgenstein argued that the members of many concepts share no set of basic properties, but are better understood as resembling each other. This is similar to how members of a family resemble each other: although they share some distinctive features

across the group (e.g., eye color, hair color, and hair texture), no members have the exact same collection of features. Wittgenstein challenges the view that concepts have clear and fixed boundaries determining the membership; his view allowed new additions to extend the category on the basis of appropriate resemblances. Using games as another example, Wittgenstein also showed that while no member of a concept (e.g., a game like chess or hide-and-seek) has any logical or epistemological primacy (i.e., all are equally members of the category), some members have psychological or pragmatic priority. For example, if someone was asked to "show the children a game" and he taught them dice, he might be told, "I didn't mean that sort of game" (Wittgenstein 1953, 1-70, quoted in Lakoff 1987, 17). In other words, and in contrast to classical theory, given a context, some members of a class are in practice considered as better examples than others. With this, Wittgenstein showed against the classical theory that, given a context, some members of a class are in practice considered as better examples than others.[31]

Hacking's use of prototypes for kinds of people is better understood as "best examples."[32] The knowledge contributed by prototypes is causal in the sense that they provide the background knowledge upon which experience is organized, thus playing a heuristic role for both epistemic and instrumental purposes (e.g., devising strategies for intervention, theory articulation). Without them, inquiry into new experience would proceed blindly. Prototypes may not provide ultimate knowledge about a kind's constitution,

[31] The Prototype theory calls on the ideas of Lakoff and Zadeh. Lakoff suggests a view held by Wittgenstein and Austin that the meaning of a category is not united by a single essential property, but that the relationship held between the different senses of a word explains why such a word expresses all of its diverse senses. These two roles correspond to what Lakoff calls "metonymy" and "metaphor" in his taxonomy of prototypes. In cases of metonymy, there is a central member in the category from which other members are extended; "the part stands for the whole," which he explains using the example of the adjective "Healthy". Zadeh, on the other hand, introduces the idea of "fuzzy sets". Unlike traditional "sets" of which one is either a member or not a member, "fuzzy sets" do not have hard boundaries but instead have gradients. An example of this is found in categories like "short" and "tall", where a 6" tall man and a 7" tall man are both in the "tall" category but to varying degrees (Lakoff 1987, 18-22).

[32] "Just as people, at least those who live in Atlanta or the Bay Area, do not say 'ostrich' when wanting to mention an example of a bird, so it seems that clinicians do not casually give nonabused patients as examples of multiples. Of course ostriches are birds, and known to be so, and there are nonabused multiples, but they are not prototypical" (Hacking 1995a, 83).

capacities, and properties, but in practice, they are the best guide for organizing, predicting, and intervening—all objectives in the traditional pursuit of causal knowledge.

2.2.3. Transient Mental illness and Ecological Niches

While elaborating on his MUP case studies, Hacking highlights the occurrence of diagnosis categories that were in use for a relatively short period of time in the history of Psychiatry. Hacking identifies the putative conditions that these categories were intended to capture as "transient mental illness". The conditions captured by such categories were considered as mental illness only for a limited period of time, relative to the acceptability of the medical taxonomy within which they were conceived. Fugue (or ambulatory automatism), multiple personality disorder, and homosexuality, which were considered mental illnesses for a brief period of time by the medical establishment, are examples of transient mental illnesses. In Hacking's account transient mental illnesses come into being, are sustained, and come out of existence within the context of an ecological niche. An “ecological niche” is a concept borrowed from ecology, which situates a specific species within a larger context, namely, its ecosystem, taking into account both the species’ habitat and the role that such species play within it. Species actively modify their habitats though their interactions and their use of resources, evolving side by side with other species and their habitats. The series of conditions specified within an ecological niche makes it possible for a species to thrive within an ecosystem. Similarly, Hacking argues that a given set of conditions, present at a given point in time and society, have allowed for a certain putative mental illnesses to emerge and be sustained. Specifying the relevant conditions under which the categories for such conditions thrived is tantamount to specifying its “ecological niche.”

Although the metaphor of an ecological niche clarifies the notion of transient mental illness in particular, it also is a valuable image for understanding the emergence and persistence of kinds of people in general. It highlights the complexities of the emergence and evolution of kinds of people relating both to the distinctive resources and needs of a given

society and such characteristics as geographic location, cultural and social history, and values. The concept also highlights both the plasticity and instability of kinds of people: when a key resource or need within an ecological niche vanishes, the kind of people it sustains also becomes extinct. In other words, "[t]he concept of an ecological niche […] reminds us that there must be many relevant vectors in play. To postulate a niche for an illness is to make two kinds of claim – one positive, one negative. In the presence of the relevant vectors, the illness flourishes; in their absence, it does not" (Hacking 1998, 82). Given this fact, understanding a given kind of person requires studying the conditions that provide the space for this kind of person to emerge—and studying other similar environments in which such a kind of person is absent.

In *Mad Travelers* (Hacking 1988, 80), Hacking discusses the four "vectors" present in an ecological niche: "medical taxonomy, cultural polarity, observability, and release." In mechanics, a vector refers to a force acting in a given direction. In a similar way, Hacking conceives of the ecological niche vectors as four forces acting in distinct directions, whose sum accounts for the emergence of a kind of person. According to Hacking, "…the metaphor [of a vector] has the virtue of suggesting different kinds of phenomena, acting in different ways, but whose resultant may be a possible niche in which a mental illness may thrive" (Hacking 1998, 82).

Hacking uses fugue to illustrate the four vectors. Fugue fits within the medical *taxonomy* of hysteria, epilepsy, and a combination of the two. Corresponding to the *cultural polarity* vector, Hacking notes two opposing (French) social phenomena between which fuguers were trapped: the popularization of tourism in the middle class, and the increasing numbers of criminal vagrancy among the poor. The former was perceived as a positive social development, while the latter were perceived as a social threat. Being a fugueur, Hacking suggests, "was an option that for the less fortunate lay between affluence and crime" (Hacking 1998, 82). The vector of *observability* was present in France's surveillance system. Primarily intended for detecting deserters and draft dodgers, it also made fugueurs visible, as

travelers were systematically scrutinized and required to carry identifying documents. And finally, fugue provided *release* for the tension created by the cultural polarity vector. Tourism and vagrancy were the two alternatives open to people wanting to escape their homes. French fugueurs could not access these options: tourism was financially out of reach, and they rejected vagrancy. In the United States and England, vagrancy was not perceived as a social malady to be controlled, tourism had not become trendy among middle-class people, and identifying documents were not required for itinerants. Hence, the fugue phenomenon did not occur.

Hacking compares and contrasts his own notion of an ecological niche with Foucault's discursive formations. Both highlight the complexities involved in the emergence of a category under which people are conceived as being of a kind. However, Hacking argues that Foucault's notion falls short because it ultimately focuses on language, while his (Hacking's) own analysis also addresses "the larger world of the material existence" that people inhabit (Hacking 1998, 85). Foucault himself moved on from his notion of a discursive formation to the notion of an "apparatus" in an effort to capture a more heterogeneous picture of the analytics of power, one that included both linguistic and non-linguistic elements (Foucault 1977b, 198). Foucault's influence on Hacking is great; however, further comparison of their notions of discursiveness and the ecological niche fall beyond the scope of this dissertation.

Hacking uses the metaphor of an ecological niche almost exclusively in *Mad Travelers*, perhaps because the cases of fugue and multiple personality are a better fit, and because, since they are matters of the past, they are less controversial than current categories. The notion of an ecological niche, nonetheless, provides a tool for the analysis of present categories as well, and creates some doubts regarding their permanence. Complexity and instability are the two cautionary lessons suggested by the notion of an

ecological niche in the analytics of the emergence, thriving, and decline of categories of people.[33]

2.3. Retractions and Revisions: Hacking's Semantic Resolution to the Problems of Kinds

In this section, I review the central changes in Hacking's terminology. On the basis of this exposition, I provide an interpretation of a polemic passage that has been targeted by some of Hacking's critics.

The most well known account of Hacking's philosophical proposal of the classification of people is found in his discussion of psychiatric categories presented in *The Social Construction of What?* (Hacking 1999). Although Hacking has retracted some of these notions, reviewing his original position is worthwhile for several reasons. First and foremost, Hacking's statement of retraction provides a better understanding of the philosophical commitments contained in his original terminology. Second, despite the fact that some of the criticism of Hacking reflects a limited reading of his work, it nonetheless motivated Hacking to abandon his original terminology. Third, accounting for these changes provides a more comprehensive understanding of Hacking's MUP project, particularly as it relates to the traditional debates between scientific realism and social constructivism emerging in the philosophy of psychiatry. Fourth, it provides some insight into the open paths for the further development of the ideas presented by Hacking.

[33] The notion of transient mental illness could be understood as a special case of kinds of people. Hacking uses the notion of ecological niches to account for what makes possible short lived categories of mental illness to come in and out of existence. Hacking's "four vectors" of an ecological niche as a tool of conceptual analysis and his "five-vector" framework for the analysis of kinds of people suggests an overlap with his account of kinds of people more generally. Perhaps the four vectors noted in relation to the ecological niches in which mental illness thrive were a precursor of the more robust 5-vector analytic framework of kinds of people. In contrast to the notion of ecological niches, the 5-vector framework could account for the legitimacy of categories. Furthermore, the notion of kinds of people does not imply that all kinds of people are transient. For instance, the case of schizophrenia may be understood as a kind of person, but not as a case of transient mental illness (at least not yet). This last point may be subject to further discussion in relation to the implications of the notion of looping effect concerning conceptual change. In the last chapter I discuss the extent to which Hacking's account of kinds of people in terms of looping effects imply a substantive conceptual and ontological change

In an influential passage in *The Social Construction of What?*, Hacking presents a "semantic resolution" of the debate between scientific realism and social constructivism as related to categories of mental illness. With this resolution, Hacking calls attention to what he considers a richer and more philosophically relevant analysis of the dynamics of MUP, which he had been elaborating ever since the early 1980s. Although Hacking has abandoned the nosology used at the time, this passage on the semantic resolution has inspired some of the most insightful criticisms of Hacking's account of kinds of people.[34]

Hacking frames his intended semantic resolution between scientific realism and social constructivism in terms of the nosology of human kinds, interactive kinds, and indifferent kinds. The dilemma, so understood, emerges from the contrast between interactive and indifferent kinds, and the recognition of some human kinds as comprising both an interactive and an indifferent kind. Hacking resolves the dilemma by showing how some human kinds—childhood autism, for example—can be adequately characterized as both indifferent and interactive, without falling into a contradiction:

> Suppose that childhood autism is at bottom a biological pathology P, namely what has traditionally been called a "natural" kind and what I here call an indifferent kind. What then happens to the claim that childhood autism is an interactive kind? […] Here we want to say both that childhood autism is (is identical to) a certain biological pathology P, and so is a "natural" kind or an indifferent kind. At the same time, we want to say that childhood autism is an interactive kind, interacting with autistic children, evolving and changing as the children change. (Hacking 1999, 119)

The apparent contradiction can be stated as follows: if X (e.g., childhood autism) is a brain pathology, then it is an indifferent kind (i.e., a brain pathology does not fit the criteria for interactive kinds). However, X (e.g., again, childhood autism) arguably is an interactive kind (i.e., the category and the set of objects it describes interact in the manner specified in the previous section on interactive kinds). Therefore, how can X (e.g., childhood autism) be both

[34] For instance, Cooper 2004, Murphy 2001, and, in a more attenuated way, Tsou 2007.

an indifferent kind (exhibiting no interaction) and an interactive kind (exhibiting interaction)? How can it interact and not interact at the same time?

Hacking borrows from Hilary Putnam's semantic views on meaning and reference to answer this dilemma. In "The Meaning of 'Meaning'" (Putnam 1975, 269). Putnam asserted that the meaning of a particular term is better understood in terms of a "normal form description" consisting of a "finite sequence," or "meaning vector," among whose components are syntactic and semantic markers (e.g., "noun" and "animal," respectively) as well as the description of its prototypical features (i.e., a stereotype) and its extension.[35] Putnam defended a realist view in which both the real world and society play an indispensable role in the determining the meaning of a word. Putnam's realistic account of meaning determination was characterized by two general positions, (i) the indexicality of terms (in particular, natural kind terms, e.g., 'water, 'tiger' and 'lemon'), and (ii) the hypothesis of the "social division of linguistic labor." Both are central to Putnam's view of meaning as a vector. Both aspects support each other.[36]

In his famous Twin Earth argument, Putnam presented two notions: (i) that the meaning of a term (understood as intension) does not determine its extension, and (ii) that the actual stuff which one intends to refer to with a term is indispensable to the determination of meaning. Terms like "water'" (i.e., natural kinds terms) are better understood if they are

[35] He opposed what he called "traditional theory" (TT), which combined two views: that the (i) meaning (understood as intension) determines the extension of a term, and that the (ii) meaning (understood as intension) is determined by the psychological state of an individual. Rejecting the traditional psychologism suggested in the second point. Putnam claimed that the meaning of a term is not determined by a psychological state (i.e., the concept of a term, which is known by competent speakers)—that "meanings ain't in the head"—and made room for an alternative account of meaning (more generally speaking, of the concept of a term).

[36] Putnam's position on this was very close to Saul Kripke's, who claimed that names, in contrast to descriptions, are better conceived of as rigid designators which designate the same object in all possible worlds, i.e., "a possible state (or history of the world)" or "counterfactual situation" (Kripke 1980, 16). For example, "Aristotle" (i.e., a name), in contrast to "the last great philosopher of antiquity" (i.e., a description), is a rigid designator; that is, it picks out the same thing in all possible worlds. Aristotle could have not been "the last great philosopher of antiquity," but he would still have been "Aristotle," the person designated by such name (Kripke 1980, 16). Putnam extended the treatment of proper names as rigid designators to the case of natural kind terms. So Putnam states: "Kripke's doctrine that natural-kind words are rigid designators and our doctrine that they are indexical are but two ways of making the same point" (Putnam 1975, 234). Hacking notes, however, that how their views were distinct in important ways (Hacking 2007d).

treated as having “an unnoticed indexical component,” just as other clearly indexical terms, such as proper names and personal pronouns, do (e.g., “Oscar,” “Aristotle,” “I”, “he”).

In addition to defending the indexicality of terms, Putnam also opposed the traditional view of meaning with “the hypothesis of the universality of the division of linguistic labor,” according to which the meaning of a term is not exhausted by the cognitive state of a single individual but rather extends to a larger “semantic” community. He captured the basic idea in the following metaphor: "[T]here are two sorts of tools in the world: there are tools like a hammer or a screwdriver which can be used by one person; and there are tools like a steamship which require the cooperative activity of a number of persons to use. Words have been thought of too much on the model of the first sort of tool" (Putnam 1975, 229).

Putnam urged us to think of words as steamships, “tools” requiring the cooperation of a diverse number of persons in order to be “used.” He offered the term “gold” as an example. If the linguistic community is a “factory,” different individuals have different jobs concerning gold: for instance, some buy it and wear it as wedding rings, others sell it for the production of wedding rings, others determine whether or not a wedding ring is truly made out of gold, others sell wedding rings, etc. Each of these individuals do not have to perform each of these activities, including determining whether or not a given ring is made of real gold or not. In fact, it is not uncommon that those who buy rings are unable to tell for themselves whether a given ring is made of gold; they instead rely on an expert who can do so for them.[37]

[37] Along these lines, Putnam put forward his hypothesis of the universality of the division of linguistic labor: "Every linguistic community exemplifies the sort of division of linguistic labor just described: that is, possesses at least some terms whose associated 'criteria' are known only to a subset of the speakers who acquire the terms, and whose use by the other speakers depends upon a structured cooperation between them and the speakers in the relevant subsets" (Putnam 1975, 228). In other words, in a given linguistic community, as the division of linguistic labor associated with a given term becomes more complex and specialized, fewer speakers who have acquired the term (i.e., some aspect of the meaning of the term) also know the method for fixating its extension. However, they would know those aspects of the meaning that are relevant to them. Therefore, “it is only the sociolinguistic state of the collective linguistic body to which the speaker belongs that fixes the extension” (Putnam 1975, 229).

Putnam envisioned the determination of a term's meaning as a vector, integrating the diverse aspects contributed by different subgroups of the linguistic community.[38] Such a meaning vector would formally include syntactic and semantic markers (e.g., "noun" and "animal," respectively), and the description of its prototypical features (i.e., a stereotype)[39] as well as its extension (according to the thesis of the indexicality of terms) (Putnam 1975, 269). In a sense, the world itself, at the most basic level currently known, must be included in the meaning vector of a given term, as well as all of the objects which have the appropriate similarity relation to it (i.e., all of the Xs that are known to possess the same "hidden structure," in case the knowledge of such structure is available to a subset of experts within the linguistic community). Thus Putnam concluded:

> [T]he grotesquely mistaken views of language which are and always have been current reflect two specific and very central philosophical tendencies: the tendency to treat cognition as a purely individual matter and the tendency to ignore the world […] Ignoring the division of linguistic labor is ignoring the social dimension of cognition; ignoring what we have called the indexicality of most words is ignoring the contribution of the environment. Traditional philosophy of language, like much traditional philosophy, leaves out other people and the world; a better philosophy and a better science of language must encompass both. (Putnam 1975, 270)

Putnam's view of meaning as a vector was an attempt to bring together the contributions of both the social world and the world itself in the determination of the meaning of general

[38] According to Putnam, this sort of mundane division of labor also involves a "division of linguistic labor." Although all of the features generally thought to be associated with a term such as gold "are present in the linguistic community considered as a collective body," and although "everyone to whom gold is important for any reason has to acquire the word 'gold,'" not everybody has to acquire the method of recognizing gold. Instead, the linguistic community "divides the 'labor' of knowing and employing the various aspects of the 'meaning'" of the term (Putnam 1975, 227-228). This division of linguistic labor increases as a result of scientific development. This is exhibited in the example of "water," which required no great division prior to 1750, i.e., before its molecular structure was known. Although most speakers in our linguistic community would know the necessary and sufficient condition of water, namely, H_20, not all of those speakers would be able to distinguish water from other liquids with a similar appearance.

[39] Instead, all competent speakers in a linguistic community would be able to associate a given term with a stereotype, a conventional idea about how an X looks and behaves. The ideas associated with stereotypes need not be, and often times are not, completely accurate. A stereotype merely indicates the features that a "normal" individual of the class would exhibit, according to a linguistic community (or a subset of a linguistic community, in which case one could say that there may be alternative stereotypes of an X).

terms, and natural-kind terms more specifically. The first of these contributions is provided by the linguistic community as a whole, and the second by the hidden structure shared by the set of objects of a class, when the knowledge of such a kind is available. Thus, Putnam also intended to reconcile the two contrasting intuitions underpinning the debate between social constructivism and scientific realism: he acknowledged the contribution of the linguistic community at large, and at the same time, he stresses the indispensable role played by the actual thing as it gets to be known at its most fundamental levels. This is precisely what Hacking finds appealing in Putnam's semantic account, and what he borrows for his own intended semantic resolution.

Hacking points out two multi-layered dimensions that play a part in the formation of a given class of person: the descriptions associated with the class (including a stereotype), and its intended extension. In the case of a class of people, this is constituted by both the flesh-and-blood set of people so classified, as well as by the "hidden structure" presumably shared by all individuals (if the knowledge of one such "hidden structure" is known by the appropriate subset of experts belonging to the pertinent linguistic community) (Hacking 1999,120). That is what would amount to a Putnamian description of the class and its extension.

Hacking uses a Putnam-style framework to shift his own analytical focus from semantics to the dynamics between the distinct dimensions involved in the determination and transformation of a given class. This also captures an idea suggested by the notion of the looping effect. Along those lines, Hacking states:

> [W]e have several values for the X in the social construction of X = childhood autism: (a) the idea of childhood autism, and what that involves; (b) autistic children, actual human beings, whose way of being is in part constructed. But not (c) the neuropathology P, which, ex hypothesis, we are treating as an indifferent kind, and which Putnam would call a natural kind. […] For us, the interest would be not in the semantics but in the dynamics. How would the discovery of P affect how autistic children and their families conceive of themselves; how would it affect their behavior? Which children, formerly classified as autistic, would now be excluded, and what would that do to them? (Hacking 1999, 121)

Hacking now says that when it comes to the classes of people formed on the basis of psychiatric conditions, a brain pathology known to the community of experts would serve to fix the reference of the class (given a concrete case, the classification would pick out the hidden structure of the class; i.e., the thing itself, not just the description). This does not, however, override other aspects contributed by other members of the linguistic community (e.g., other experts, practitioners, caregivers, the people so classified, their families). Moreover, as suggested in the hypothesis of the universality of the division of linguistic labor, the knowledge of the hidden essence of a class, even if available at a given time, might be known only to a small subset of the whole linguistic community. After all, not all of the members of a linguistic community need to know every single bit of information about a class; only those to whom the knowledge is relevant to the job they have to perform in the "social fabric" of an X (i.e., a class of people).

A Putnam-style view of meaning plays two roles in Hacking's "semantic resolution" between social constructivism and scientific realism in the context of the classification of people on the basis of mental illness. First, the inclusion of the reference of a kind-term in the determination of its meaning is explicitly suggested in Hacking's discussion. This captures his basic intuition that there is a role to be played by the world itself in the constitution of a kind. There is something real in the world that makes an X be what it is and excludes other things or peoples. This is a realist commitment.

Second, just as Putnam rejected a definitional approach for the determination of the meaning of kind-terms and introduces and gives support to a notion of stereotypes, so Hacking welcomes the notion of stereotypes in his own treatment of the descriptions associated with mental conditions. A given stereotype of an X belongs to either a linguistic community as a whole or to a specific subset. At a given point in time, distinct stereotypes can be in use in distinct subsets of the linguistic community. The knowledge of a given stereotype indicates the minimum knowledge required for linguistic competence within a linguistic community or one of its subsets. The knowledge of the "hidden structure" of a class

may or may not be, at a given time in history, a part of its stereotype; alternatively, when available, the knowledge of such a "hidden structure" may appear in the stereotype of a given subset of the linguistic community and not in the stereotype of another subset. Stereotypes lay down the common lore of a linguistic community (or one of its subsets): they contribute to the social aspect (or social constructivist aspect) of the account.

Moreover, a version of a causal theory of reference influences Hacking's views on ontology, as suggested in the pragmatic realism of his interventionist philosophy of science, as well as in his views on "historical ontology." Hacking's focus is, however, on the dialectics of the two elements: the realist and the social constructivists elements—namely, the finding of neuropathology for a given condition or class—and the ways in which such knowledge impacts the experiences, behaviors, treatment, and the rest of knowledge about the people so classified. He concentrates on the "dynamics" between the different actors and the "semantic" levels involved in the delineation of a "human kind," or class of people. Putnam's semantics serves Hacking insofar as they bring together two more general dimensions that constitute a kind: a set of associated description(s) of the class, and the class's putative extension (the aggregate of individual people, their behaviors, and experiences, as well as their brain pathology).

The language Hacking used to formulate the initial version of his analytic and "partial framework" for the analysis of MUP also suggests the influence of Putnam's theory of meaning (Hacking 1986). This initial formulation consisted of two vectors: the "labeling from above, from a community of experts who create a reality that some people make their own," and the bottom-up reception and reaction of that labeling, as exhibited in people's "autonomous behavior [...] which presses from below, creating a reality every expert must face" (Hacking 1986, 111). The idea of "vectors" still shapes Hacking's most recent reformulation of his account of kinds of people (Hacking 2007a), although he has increased the number of vectors from two to five.

Hacking's case studies illustrate the different ways science has provided the space for thinking about certain "conditions" (like MPD or fugue) as types of persons. Scientific discourses contribute to such transformations in a variety of ways; the looping effect also takes place in a variety of ways. In each case, however, it is clear that through its implementation in diverse social institutions, scientific discourse transforms the views of those classified as being of a certain kind, and also the ways in which they are treated under such presuppositions. In some cases, the people classified reclaim the category and transform its very meaning. Fugue and MPD further enrich our understanding of the philosophical implications of Hacking's MUP project.

My analysis of MUP also shows how the classifications crafted within the sciences interact with the people they classify through a diversity of social institutions, how the people they classify benefit or are damaged by them, and how, in response, these people resist or appropriate them to their own benefit. This back and forth between classifications and the people they classify is rooted in our social life, and yet its implications go beyond the social. It has to do not only with the way in which we see other fellow human beings and our own selves, but also with what types of human beings we believe or assume there are. The implications are both epistemic and ontological. The scientific status of categories of people does not merely add to them the cachet associated with the scientific enterprises, but dissects human beings into "real types."

Chapter 3

The Styles of Scientific Reasoning

Parallel to the philosophical project of MUP, Hacking develops his Styles Project. A complementary reading of both projects suggests some interesting overlaps, and perhaps even a comprehensive philosophical background for MUP. Hacking analyzes traditional problems within the philosophy of science, such as truth, reason, and scientific ontology, approaching them from an original philosophical framework of scientific styles.[40] In this chapter I review Hacking's styles project and its philosophical background. After laying down the basic philosophical underpinnings of the styles project, I offer a brief account of the origins of each of the styles and their criteria of validity, followed by a discussion of the two key notions: the self-authentication, and the techniques of stabilization of the styles. I subsequently discuss the ontological import of the styles and conclude the chapter by relating the Styles and MUP projects.

Building on the work of A. Crombie, an historian of science, Hacking identifies a set of six styles of scientific thinking and doing and turns them into a unit of philosophical analysis of the sciences. Hacking argues that these six styles are grounded in the actual development of scientific practices, as shown in the historical records of the cultural milieu within which scientific research is produced, and the cognitive capacities of the peoples who have contributed to its development. Despite traditional divisions (e.g. natural sciences vs.

[40] By using these styles, Hacking contributes an alternative unit for the philosophical analysis of the sciences. Other units used in the philosophical literature include scientific theories, hypothesis and laws (logical empiricism, e.g., Nagel 1961; Hempel 1965), models (Cartwright 1983; Morgan and Morrison 1999; da Costa and French 2000; Giere 2010), research programmes (Lakatos 1978), mechanisms (Glennan 1996; Machamer, Darden and Craver 2000; Craver 2007), scientific traditions (Laudan 1977), comprehensive theories (Feyerabend 1974 and 1981), and famously, scientific paradigms (Kuhn 1962). It is worth nothing, however, that Hacking does not intend the styles as criteria for demarcating between science and non-science. Rather he abstracts the styles from what are arguably well-established sciences. Hacking is not particularly concerned with distinguishing between science from non-science, but accounting for the rationalities at play in works that are generally acknowledged as scientific. His point of departure is a well-established history of the sciences in the Western Tradition (Crombie 1994) Additionally, Hacking's appeal to emblematic figures to exemplify each style of reasoning, also play a key role for supporting his account of the styles. In subsequent pages I elaborate on these legendary figures.

social sciences, exact sciences vs. inexact sciences, etc.), Hacking argues that the styles of scientific thinking and doing can be—and, in fact, are—used across scientific disciplines. His styles project offers a comprehensive view of the sciences, which fall within the general philosophy of the sciences.

Hacking began his Styles Project at least three decades ago, and to date, it is still under development. The most complete versions of the proposal were published in 2009 and in 2012, and even in these articles, only half of what Hacking has projected is presented in any detail. Over the years, the proposal has undergone changes in terminology, described by Kusch and Hacking (Kusch 2010 and Hacking 2012). One of these changes is reflected in the alternative name for the project: "Styles of Scientific Reasoning and Doing" has been replaced by "Styles of Scientific Thinking and Doing." Hacking has cycled between each name in an attempt to capture their distinct aspects. "Reasoning" captures the traditional philosophical theme of scientific reason, which allows Hacking to forward a novel perspective on the basis of "cognitive history." "Thinking" is a more comprehensive notion; however, it could suggest that only cognitive operations, of a mental order, are involved. Hacking adds "and doing" to the label in order to emphasize the practical aspect of his analysis. Moreover, Hacking has expressed ambivalence about the very notion of "style" (Hacking 1992d). because of its connotations. Consequently, he has considered "Ways of Thinking" and "Ways of Finding Out and Doing" as alternative descriptions for his project. Despite the variability in its terminology, most of the items that appeared in the first formulation of the project are still present in its current incarnation.[41]

[41] Although Hacking has only published about half of his projections to date, he has laid out the complete picture schematically and has made some advances on the second part of the project. The following presentation of Hacking's styles project is based on its latest formulations (Hacking 2009 and 2012), as well as a two-part seminar on the styles offered by Hacking at the UCSC Philosophy Department in Winter 2007 and Winter 2009.

3.1. Background

Hacking builds on the work of historian of science A. Crombie and philosopher Bernard Williams in articulating the philosophical framework of his styles project. In particular, he uses Crombie's analytic structure and Williams' basic philosophical notions as points of departure.

Hacking adopts Crombie's six styles, laid out in *Styles of Scientific Thinking in the European Tradition* (Crombie 1994), in his own project. Crombie's styles, (i) mathematical, (ii) hypothetical, (iii) experimental, (iv) taxonomic, (v) statistic, and (vi) historico-genetic (clarified below), give Hacking "a new vision of truth and reason" (Hacking 2009a, 7); he identifies Crombie's template as a useful "starter kit" to "rethink the entire structure of scientific reasoning" from a "Leibnizian" and "anthropological" point of view. By this Hacking understands "a study of the human species, its innate powers and its current practices" (i.e., its anthropological component), while endorsing a "strong conviction about reason" (i.e., its Leibnizian component) (Hacking 2009, 13 and Hacking 2012, 605). At odds with orthodox philosophy of science, Hacking's project doesn't target the "products" of science *per se* (e.g., discoveries, theories, models, mechanisms). Rather, it provides an account of how the human species has managed "to find out" (Hacking 2009, 4).

Another potential description for Hacking's styles project might be "A Logic of Scientific Discovery"—except that the "logic" or "rationality" of scientific discovery that the project targets is understood in a comprehensive and unprecedented manner. Although he acknowledges that diverse cognitive abilities and sociohistorical pathways have made it possible to get to know what we do, Hacking contends that cognition and culture provide the analytic space for the logic of discovery (Hacking 2009, 5). These two dimensions traditionally have been thought of as being in tension: on the one extreme, cognition suggests biological underpinnings (e.g., innate capacities passed on evolutionarily), and on the other extreme, culture suggests very localized communities working together to study a given phenomenon (e.g., Fleck's "thought collectives"; Fleck 1979). Hacking attempts to integrate

both aspects into a background for his styles. They are grounded in human cognitive capacities, which are developed evolutionarily; they require a specific sociohistorical context, in the absence of which they would not emerge (i.e., despite the potential for such cognitive capacities to be evolved and actualized).

Over the years, Hacking has presented the styles alternatively as a "sensible list of modes of investigation" and as "genre[s] of scientific inquiry or investigation" (Hacking 2012). He emphatically rejects the identification of the styles with either methodologies or scientific disciplines; diverse scientific disciplines use a single style while at the same time implementing diverse methodologies. Although Hacking does not offer a criteria for distinguishing styles from methodologies, he does suggest looking at their number: whereas there are innumerable varieties of methods within the sciences, and many of these can be used within a single scientific discipline, the number of styles is limited to the six considered in the template (and their combinations). Although it is possible to do so in principle, a scientific discipline rarely makes use of two or more styles.[42]

Like Crombie, Hacking characterizes a style of scientific thinking in terms of two components: (i) the type of objects of its inquiry (an ontological component) and (ii) its method of reasoning (an epistemic component). The styles of scientific reasoning establish both a way of thinking about and approaching phenomena, as well as a model for its justification. They envision a domain of phenomena that organizes experience in a certain manner, particularly as it concerns the individuation of phenomena into kind of entities. The styles of scientific reasoning introduce the kind of objects that they are concerned with (e.g., abstract numbers, such as numbers and classes, by the mathematical style; species and genera by the taxonomic style; non-observable or theoretical entities by the hypothetical

[42] For example, hypothetical modeling is equally important for sciences as different as astronomy, psychiatry, cognitive sciences, and economics. A single science such as Psychiatry makes use of the hypothetical modeling, experimental, statistical and taxonomic styles. These are distinct to the myriad of research methods that are also used within Psychiatry, to mention some, such as clinical trails, rating scales, surveys, interviews, inventories and other qualitative approaches.

modeling) (Hacking 2012, 601). The styles also introduce the types of sentences that describe knowledge claims about the entities with which they are concerned. This aspect of the styles resembles formal languages, which specify the vocabulary and rules for the formulation of their well-formed-sentences. The only sentences that are candidates for a truth-value (or validity) are those that follow the schema established by a style and that refer to the type of entities they introduced.

The styles do not help find "the truth," but they define what is going to count as such: proofs in mathematics, the creation and manipulation of phenomena in experimental inquiry, the representation of aspects of nature through theoretical models, the analysis of data and their generalization through statistical and probabilistic equations, and the principles for the hierarchical classification of living things. The sentences produced within a given style can only be evaluated using the terms established for that style—just as a statistical claim cannot be judged on the same grounds as a mathematical proof, even though it may make use of mathematical language. In Hacking's view, the methods of reasoning and the kinds of scientific objects of a given style come into being hand in hand. This does not imply that the styles emerge prior to the introduction of their methods of reasoning and their objects of inquiry; and yet, these constitute the styles.

Crombie conceived of the history of the sciences as a continuous series of events developing during long periods of time that brought about slow and gradual transformations. For example, Crombie argued that the Scientific Revolution was not an isolated or even identifiable occurrence. Instead, he claimed that what occurred in seventeenth-century Europe represented the culmination of a series of events traceable back to the ancient Mediterranean world, which began to prosper by the twelfth century (Hacking 2009a). The *long duré* contests other philosophical views of the history of the sciences as characterized by profound conceptual breaks. Hacking integrates Crombie's *long duré* with the Kuhn's revolutionarianism, and claims that a gradual and continuous progression in the history of the sciences is marked by certain events at certain points in time which bring into being new

ways of thinking and doing. Such punctuations mark the origins of a new style of scientific thinking and doing.[43] The styles do not originate from a vacuum, but through the slow and long development of ideas and epistemic resources, and the mastery of a way of thinking and doing about a domain of knowledge that proves to be better suited to deal with problems and advance solutions to questions.

Employing an historical framework, Hacking introduces a set of notions, crystallization and trailblazers, to account for the emergence of styles. *Crystallization* is a metaphoric notion that highlights the transformation of a pre-existent set of practices, which at a certain point in time acquire a form of their own. Just as water freezes at zero Celsius degrees, a style "solidifies" as its use extends through time and space. Each style is associated to an emblematic figure or *trailblazer*, who is in time recognized as a scientific legend and exemplifies in a prototypical manner the use of its associated style.

Hacking identifies crystallizations in the history of the development of each style (with the exception of the historico-genetic style), whose origins are represented by a legendary founding figure (and event). Thales was the trailblazer for the mathematical style; Boyle for experimental exploration; Galileo for hypothetical modeling; Pascal for statistics; Linneaus for the taxonomic style; and Darwin for the historico-genetic. Unlike the chemical crystallization metaphor may suggest,[44] the crystallization of a style is irreversible. However, when a style emerges from a variety of scientific practices, these practices begin to be seen from within the framework provided by the style. A style cannot go back to being the collection of practices that gave rise to it.

[43] Lakatos's "research programmes" are also a good point of reference for the time frame of the styles. A research programme for Lakatos could last centuries, and their development is better understood by its sequence of theories, some of which constitute the indispensible hard core of the programme, alongside a dispensable belt of protective auxiliary hypotheses (Lakatos 1970). However, Hacking integrates slow gradualism (e.g., Crombie's and Lakatos' timeframes) with a revolutionarianism (e.g., Kuhn's and Feyerabend's).

[44] "When water freezes, it becomes a completely new substance, ice" (Hacking 2009)—but it still can turn back to its liquid form, given the appropriate temperature.

Trailblazers do not accurately capture a historical event or even a person, but identify a mythical founding figure associated with the inauguration of a style. Scientific folklore recognizes such legendary figures from very early on in the emergence of the style, and in turn, they establish and foster the style by using it in an exemplary manner. Although they may have historical value in their own right, according to Hacking, the accuracy of their historical character is not their primary value to the style. Trailblazers do not necessarily correspond to real characters, but the legends around them make them into symbols of the style. They do not become symbols because of the style; they are already legends recognized by scientific folklore, who give a "face" to the styles.

To further characterize the styles of scientific reasoning, Hacking borrows two aspects from Bernard Williams' *Truth and Truthfulness: An Essay in Genealogy* (Williams 2004), the distinction between truth and truthfulness, and a general schema establishing how a statement can be true at a given point in history. Williams intended to provide an account of the historicity of truth. Although he did not believe that truth is an historically contingent concept, at the same time, he acknowledged that what counts as truth depends to some extent on what is logically, epistemologically, and technologically accessible at a given point in time. Hacking has incorporated William's insights on truth and truthfulness into his own project, in elaborating his account of the historical origins of the styles and the introduction a criterion to determine the truth-value of the statements associated with them. By adapting Williams' views on truth and truthfulness, Hacking can show the extent to which the styles imply a historically contingent view of truth, how truth is style-dependent, and how these two—historical contingency and style relativity—do not imply rampant relativism.[45]

Take, for example, the following statement about the constitution of airplanes: "When the aircraft travels forward, air flows over the wings which are shaped to create lift."[46] If it had been articulated in 1650, such a statement could not have been true or false; in fact, it could

[45] A brief discussion on the styles and relativism is offered by the end of section 3.3.1.
[46] "Airplane", Wikipedia, https://en.wikipedia.org/wiki/Airplane, accessed September 16, 2016.

not have even been formulated since no airplane existed at that time. Today, in the year 2017, it is a true statement. Such a statement can now be determined as true or false because of the fact that airplanes have been created and knowledge about them has been established; that is, the conditions for that statement to be true or false have been in place since the early 1900s. Williams and Hacking would note, nonetheless, that the truth of this claim does not have a history; the statement is true in an important sense because there exists in the world a kind of object about which these statements are true or false. If the same conditions allowing airplanes to come into being had been in place in the 1650s, the statement would have been equally true then. Moreover, if this statement is actually true today—that it is not mistakenly believed to be true—Williams and Hacking agree that it will continue to be true in the future.

In a sense, the truth of such a statement is "eternal." However, this does not negate the fact that the claim made by the sentence is embedded within an historical time. Although the "eternal" sense of truth, i.e., its sentential concept, has no history: <<"X" is true iff X>>, this schematic view is semantically empty. For sentences like the one about airplanes to be true or false, the conditions (social, epistemic, technological, etc.) and the criteria for determining its truth-value have to be available. The eternalist schema of truth is not sufficient to account for its truth-value. According to Williams, truth has no history and thus no genealogy, but truth-telling (i.e., truthfulness) does. Hacking borrows this distinction from Williams, presenting his styles as criteria for determining which statements are candidates for truth-value and what it is that makes them true (or false). This task reflects what he refers to as truthfulness. Moreover, when it comes to the history of the sciences, Hacking believes that there is no single genealogy of truthfulness, but rather a variety concerning different domains and standards.

Williams influenced Hacking's analysis of the genealogy of truthfulness as it concerns the past and the self in two significant ways. First, he observed that the possibility to tell the truth about the past is historically grounded. In other words, the origins of objectivity as it

concerns the knowledge of the past has a genealogy. Following Williams, Hacking distinguishes between truth and truthfulness to get around the divide between the “timeless facts” view of truth and the view that rejects the existence of objectivity (i.e., an unbiased, interest-free achievement). This corresponds to the divide between scientific realism and anti-realist social constructivism in the philosophy of the sciences. The Styles Project provides an account of the genealogy of the styles of scientific reasoning, which presumably establish the criteria of objectivity associated with their domain. Hacking accepts that truth is timeless, but switches his analytic focus to studying truthfulness in the sciences.

Second, Williams laid out a schema for characterizing what it means to be truthful. Hacking uses this framework to locate two independent aspects of truthfulness: accuracy and sincerity. A truthful person possesses both features. A genealogy of truthfulness in a given domain ideally includes an account of both aspects, although the sciences prioritizes the former and generally does not take the second into account explicitly. These two have been synchronized or desynchronized at different points in the development of the sciences.

3.2. The historical emergence of the styles

Borrowing from Williams’ account, Hacking characterizes the origins of the six styles of scientific reasoning as historical occurrences corresponding to a shift in the conception of what it means to tell the truth about the objects of study within a given domain of experience. The introduction of objects of knowledge and criteria of validity for telling the truth about them by the styles transforms experience itself and brings about an increase in understanding and explanatory power. In brief, the origins of each of the styles as proposed in Hacking's account is as follows. The origin of the mathematical style is marked by the development of diagrammatic proofs of geometrical relations in Greece, in the sixth century BCE. In the seventeenth century, the hypothetical modeling style introduces hypothetical models to tell the truth about nature, and the experimental style introduces the use of experiment and theoretical or non-observational objects. The statistical style introduces first probabilities, in

the 1650's, and later on populations during the 1800s. The taxonomic style introduces a way to tell the truth about species and genera in 1735. The historico-genetic emerges in the nineteenth century introducing a way to tell the truth about originated entities.

It matters little for Hacking's project that every detail about the origins of the styles is historically correct. The relevance of Hacking's account lies in the historical character of the styles as a philosophical account of the introduction of types of scientific objects and their criteria of validity. Furthermore, instead of developing detailed accounts of the origins of the styles, Hacking has pointed out some works as a point of reference to grasp the sense in which a style of scientific reasoning might come into being, as exemplars of the style. In the case of the mathematical style we are referred to Reviel Netz's *The Shaping of Deduction in Greek Mathematics: A Study in Cognitive History* (Netz 2003). For the hypothetical modeling style we are referred to Galileo's use of thought experiments, Steven Weinberg's cosmological work and Noam Chomsky's work on linguistics. For the experimental style the point of reference is Shapin and Schaffer's *Leviathan and the Air-Pump, Hobbes, Boyle and the Experimental Life* (Shapin and Schaffer 1985). For the Statistical style, Hacking's books *The Emergence of Probability* and *The Taming of Chance* offer an account of the development of probability and statistical reasoning (Hacking 1975b and 1990). For the taxonomic style the point of reference is Atran's *Cognitive Foundations of Natural History: Towards an Anthropology of Science* and Peter Stevens' *The Development of Biological Systematics: Antoine-Laurent de Jussieu, Nature, and the Natural System* (Atran 1990 and Stevens 1994). For the historico-genetic style the point of reference is Darwin's *Origin of Species* and Crombie's work on what he called the "the historical derivation of genetic development" or the "historical derivation: the genetic method."

3.2.1.The Mathematical Style

Hacking regards Netz's work on the development of proofs in Ancient Greek mathematics as an outstanding "cognitive history of the sciences" and a model for a

genealogy of the styles. Netz offers a historically detailed account of how human beings advanced their cognitive potential in their development of geometric deductive proofs, and of how this achievement was made possible by the development of cultural practices - remarkably, diagramming and argumentation.[47] Netz's cognitive history addressed more than the achievements of a single individual (e.g., Thales). It analyzed the achievement of a large community of people (e.g., Athenian geometricians) as well as the result of "built in" human capacity (i.e., a biological fact). Such history emphasizes the cultural developments that made it possible for the ancient Greeks represented by the figure of Thales to develop a novel way to tell the truth which consisted of *a priori* proofs of relations between mathematical objects.[48] This method went beyond the calculations that had been developed in North Africa and Mesopotamia, in that their theorems are conceived of as necessary truths accompanied by an associated understanding of why that is so.

3.2.2. The Hypothetical Modeling Style

Galileo's use of highly abstract hypothetical models in the representation of nature and the universe epitomizes the crystallization of the hypothetical modeling style in the early

[47] Netz reconstructed a collection of diagrams presumably used in ancient Greece, and then showed how the actual elaboration of the diagrams (i.e., the practice of doing them) constituted an indispensable aspect in the development of deductive reasoning. This elaboration involved more than mere thinking; it had to be performed before an audience of students, either on sand or slate. This was a practice similar to what some professors still do nowadays while teaching, namely, write with chalk on blackboards. The ancient Greek geometer engaged in his study not only by using his mind, but also by embodying his thinking in the doing of diagrams. In other words, doing the diagrams constituted an indispensable part of his thinking. Moreover, the results obtained were not only pedagogical, since the performance of the proofs for the exploration of shapes and equivalences also served as a strategy for discovering new knowledge.

[48] Innumerable cultural accidents have activated certain human capacities that otherwise might not have developed. Netz analyzed many of the central accidents occurring between 440 BCE and 360 BCE that expedited the growth of early mathematical demonstrations. These, in turn, made possible the development of mathematical proofs in Euclidean geometry. In particular, the Athenian culture of argumentativeness, the innovative use of diagrams, and the development of a precise form of accompanying text together gave rise to the "shaping of generality"—or mathematical proofs. Argumentation provided the seed for the enterprise, insofar as it was desirable to come up with a secure method (or at least, a prototype of one) for settling disputes. Diagrams and their accompanying texts gradually led to the realization of a structure for generalization (i.e., a proof). Hacking endorses Netz's account for stressing the action of diagramming as opposed to the final product, i.e., the diagrams. Drawing and performing, Hacking emphasizes, were central to the discovery of mathematical proofs.

seventeenth century. Although mathematical models have been constructed since at least the twelfth century, as exemplified by Ptolemy or Archimedes, Galileo represents the highest peak of “an increasing mathematization of nature on earth” (Hacking 2009a). Galilieo's thought exhibits a transformation in the human capacity for understanding nature through mathematical representation and systematic observation.

Galileo's use of observation differs from that of both his precursors, who seek to fit their understanding of nature to a preconceived view established by authority, and subsequent developments in the study into nature (i.e., experimental style). Galileo's approach is captured in the metaphor of God as the architect of the universe and "the Book of Nature" as the ultimate arbiter for knowledge. Nature and the universe are seen as an all-encompassing book opened before our eyes, but could only be understood if one first learns to understand the mathematical language in which it is written (Galileo 1623, 183). Galileo’s models were mostly theoretical, and many of them were only thought experiments. Even in cases where he presumably performed an actual experiment, systematic observation provided the evidence for establishing the results.

The experiment of The Leaning Tower as evidence for the "Laws of Falling Objects" illustrates the hypothetical character of Galileo's work. The "experiment" was intended to show that if two bodies, equally shaped and made out of the same material but distinct in weights and sizes, are dropped from a considerable height (such as the summit of the campanile of the Tower of Pisa) they would land simultaneously. Galileo continued developing his position after the statement of the experiment, which culminated in the formulation of the laws of free fall presented in his final work, *Discourses and Mathematical Demonstrations Relating to Two New Sciences* (Galileo 1638, 183).

The following passage exemplifies a typical Galilean argument. In it Galileo establishes that uniformity of accelerated motion of objects in free fall (Galileo 1638, 336):

> When the velocities are in proportion to the spaces traversed or to be traversed, these spaces are traversed in equal intervals of time; if, therefore, the velocities with

> which the falling body traverses a space of four cubits were double the velocities with which it covered the first two cubits (since the one distance is double the other), then the time intervals required for these passages would be equal; but for one and the same body to move four cubits and two cubits in the same time is possible only in the case of instantaneous motion; but observation shows us that the motion of a falling body takes time, and less of it in covering a distance of two cubits than of four cubits; therefore, it is false that its velocity increases in proportion to the space. (Galileo 1638, 341)

Galileo presented a hypothetical scenario in which an object such as a stone or a canon projectile (or a pair of them, of different size and weights) is placed at an elevated height and released in free fall. After describing the Aristotelian interpretation (Galileo 1638, 341), Galileo went on to hypothetically argue against it on the basis of the consequences that would follow it taken as true. First, it presents an accepted conception about a hypothetical situation (e.g., free fall, movement of the earth, sunspots). Then it explores the empirical implications for and against the principles used by the accepted theory (e.g., Aristotelianism, Copernicanism). Finally, it presents an alternative interpretation that better fits the situation under consideration, using observation accompanied by a series of mathematically modeled implications.

Steven Weinberg's cosmology and Noam Chomsky's views on grammar are two contemporary examples of the hypothetical modeling style (Hacking 2009a, 103). Although the models created by both of these scholars generally are well informed by a great deal of experimental results, Hacking notes, their evaluation consists of the comparison between model and observation, which is the mark of the hypothetical modeling style.

3.2.3. The Experimental Style

The experimental style also emerged in the seventeenth century, differentiating itself from the hypothetical modeling style by its postulation and measurement of unobservable phenomena and/or entities. Although in many respects the distinction between the hypothetical modeling and the experimental styles is blurred, the distinctive feature of the experimental style is the creation of phenomena which otherwise would have not been found

in nature. Robert Boyle's demonstration of the existence of the vacuum through the construction of the air pump is presented by Hacking as the exemplar of the style.

Boyle's experiments produced *matters of fact* (rather than only hypotheses), through the collective work within a social and discursive order. The epistemological and ontological status of the "facts" produced through experiment depended upon the acceptance or rejection of the social structure in which these facts were originated.[49] Boyle's experimental program extended the role of human agency onto reality itself. The ability of human beings to create and recreate facts became the basis for establishing the validity of knowledge about nature. Boyle and the experimentalists saw themselves as providing the foundations of knowledge of empirical matters by *fact making* (Shapin and Shaffer 1985, 80-81).

Boyle used three inter-reliant technologies, or "knowledge-producing tools". The first was a material device constructed and operated for producing phenomena, the air pump. This was the central figure since its design integrity was key to establish the existence of the vacuum. The machine's engine needed to be capable of producing the desired effects (Shapin and Shaffer 1985, 135). The second technology was a mechanism for passing the knowledge of the phenomenon created to those who could not directly witness its creation. The presentation of the experiments in a public space, the Royal Society's assembly rooms, was indispensable since the presence of multiple witnesses provided reliable testimony and conferred authority to the claims.[50] The third technology consisted of social mechanisms for

[49] Hobbes contested Boyle's analysis, pointing out that the experimentalist program created the very phenomenon to be demonstrated (e.g., the vacuum) by utilizing apparatuses (i.e. the technologies of fact-making), both material and social, devised for that very purpose. Hobbes also protested that access to allegedly public experimental phenomena was restricted to a selected elite, namely the members of the Royal Society of London. In fact, according to Hacking, the very aspects that Hobbes criticized became hallmarks of the experimental/laboratory styles: "Boyle …made a device that produced a partial vacuum in a container, thereby defeating nature… [and] also convinced everyone that that was what he had done" (Hacking 2009a, 119).

[50] Boyle and Hooke, moreover, established a procedure for registering experiment results of at The Royal Society; a number of *qualified* persons (whose credibility depended upon their expertise and credentials) invited to witness the performance provided "undoubted testimony" by signing the report. In addition, the reports had to be written according to protocols designed to enable the replication of the experiment and their results, which in turn multiplied the witnesses and the consistency of the results. In

mediating the interactions between experimenters and their knowledge-claims. Discursive procedures were established for the presentation and diffusion of experimental results, as well as for the collective organization of those participating in their production. The Royal Society, a public but rigorously controlled institution, provided the social structure for standardizing the conventions for the communal generation and evaluation of experimental facts (Shapin and Schaffer 1985, 135).

Here again Hacking emphasizes cognition and culture as the two levels at which the origin of a style takes place, which are captured in Shapin and Schaffer's account. It is not one man or the vacuum, but about a series of practices that allowed the collective operation of an instrument, as well as the interpretation and evaluation of the phenomena it generated. Boyle and his air pump are merely emblems of the collective sum of forces required to establish the creation of phenomena as an adequate form of knowledge.

3.2.4. The Statistical Style

Hacking elaborates on the origins of probabilistic and statistical thinking in *The Emergence of Probability* and *The Taming of Chance* (Hacking 1975b and 1990), in addition, "Statistical Language, Statistical Truth & Scientific Reason: The Self-Authentication of a Style of Scientific Reasoning" (Hacking 1992c). These works present a genealogy of the statistical style (Shapin and Shaffer 1985, 113).[51] Hacking traces the origins of the statistical style back to the Pascal-Fermat correspondence in 1650, in which Pascal offered a solution to old gambling problem, by introducing "a completely new standard of excellence for probability calculations" (Hacking 1975b, 60). Pascal's solution fostered the systematic study and development of the mathematical theory of probability. Here again, Hacking emphasizes the communal aspect of Pascal's findings, as these emerged from discussions held by a group of

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Shapin and Shaffer's view, these procedures created a "a technology of trust and assurance that the things had been done and done in the way claimed" (Shapin and Shaffer 1985, 116).

[51] See also Hacking 1965 and 2001a.

mathematicians and Parisian gentlemen formed under the patronage of Duke of Roannez, a gifted mathematical amateur who provided his salon for the meetings. Huygens, one of the members of the group, was studying probability when the Fermat-Pascal correspondence took place, and it was he who published the first probability textbook that included Pascal's solution to the famous gambling problem.

Pascal transformed the subsequent understanding of the notion of probability by integrating two aspects. One was epistemological, dealing with the "degree of belief warranted by evidence." The other was aleatory, concerning "the tendency, displayed by some chance devices, to produce stable relative frequencies" (Hacking 1975b, 1). The problem in the Pascal-Fermat conversation was entirely aleatory, concerning the division of stakes in an interrupted game of chance. A few years later, Pascal applied probabilistic reasoning more widely. Pascal's wager is one such remarkable application.[52] In his *Pensées*, Pascal showed that "aleatory arithmetic could be a part of a general 'art of conjecturing'", extending the inference used in chance games to cases that were not previously thought of as involving chance, offering a model for problems involving decisions under uncertainty (Hacking 1975b, 63).

The concept of probability developed from the end of the seventeenth century to well into the eighteenth, by such scholars as Huygens, Laplace, Bernoulli, Spinoza, Hume, and Condorcet. A turning point, that prompted the rise of statistics, came with Paul Graunt and William Petty's "Political Arithmetic," which may have been the first systematic study of public statistical data. Quantitative facts about London's inhabitants were recorded since 1603, but it was only after the plague that people began to think it "necessary to set figures in a more regular way" (Hacking 197b5, 102). After Petty published his 1667 revision of Graunt's work demonstrating the value of the systematic study of statistics, other European cities followed

[52] Hacking writes, "It is not a matter of chance whether or not God exists, but it is still a question of reasonable belief and action to which the new probable reasoning can be applied" (Hacking 1975, 12).

London's lead and began keeping more exhaustive records (Hacking 1975b,102). Earlier records, such as annuities, began to be seen with new eyes.

In *The Taming of Chance*, Hacking presents a metaphor of the transformation from a deterministic to a probabilistic worldview and of the emergence of statistics that followed the development of epistemic probability: the avalanche of printed numbers that caused the erosion of determinism. This transformation culminated in the nineteenth century. The creation of new institutions for counting people and the public availability of records, allowed the development of pioneering statistical studies, such as Graunt and Petty's studies. The erosion of determinism was marked by the transformation of the notion of probability, in such a way that the world started to be seen as "regular and yet not subject to universal laws of nature" (Hacking 1990, 1). Furthermore, the rise of "a new kind of indeterministic law" displaced the idea of "human nature by the idea of normality" (Hacking 1990, 179). Locke's and Hume's inquiries into human nature were replaced by Durkheim and Galton's studies on normal people and societies.

By 1827, probability theory had already advanced the notion of a normal distribution or curve of error, graphically represented as the Gaussian "bell-shaped curve." By 1835, Quetelet transformed further the understanding of the bell curve in his *Treatise on Man*. (Quetelet 1842). Extending the application of the bell-curve to biological and social phenomena, Quetelet advanced the notion of "the average man," a "man" who is not an individual but a "homme type," e.g., a racial type obtained from the characteristics of a nation.[53] The "reality" of the quantities of the average men were not "real" for a singular person but for the whole (idealized) population.[54] Quetelet's move to an ideal type was

[53] "Quetelet introduced a new objective measurable conception of a people. A race would be characterized by its measurements of physical and moral qualities, summed up in the average man of that race" (Hacking 1990, 107).

[54] Quetelet established his observations based on two data collections: the height and chest measurements of eleven Scottish regiments, and the heights of 25,878 American Civil War volunteers. In the first case, Quetelet obtained a distribution for 5,738 chests of 39 inches with a maximum at 1073 soldiers, and 40 inches for 1079 soldiers. He concluded that the average Scottish soldier's chest is nearly 40 inches, with a probable error of 33.34 millimeters; Quetelet thus "gave us the mean and the

central for the development of statistical laws, as opposed to the mere collection of facts and apparent constancies.[55]

The notion of “normal people” came into being intertwined with considerations of value, swinging between the “is” and the “ought to.” Durkheim’s and Galton’s views on the normal exemplify this contrast. Durkheim opposed “the normal” to “the pathological”. The normal is average; the pathological is deviance. Around 1800, the notion of the pathological was associated with disease. There were no pathological people; there were pathological organs. Pathology, as a discipline, involved the study of the composition of human tissues, organs, and secretions. A sick organ and the secretions it produced were considered pathological, rather than people or populations. The normal was understood as the opposite of the pathological. Being healthy was ‘good’ and being sick was not. Comte turned this around by defining the pathological as a “deviation from the normal” (Hacking 1990, 164), and variation became defined in terms of a “normal state.” There are two aspects to this latter notion: the distinction between the normal and the pathological is continuous rather than discrete, and deviation is a departure from the norm (rather than the other way around). Although a similar drive toward standardization had been present elsewhere in society, as demanded by industrialization, Hacking contends that “our modern usage of the very word ‘normal’ evolved in a medical context.” This made the law of variability “the basis for social science and it became part of its political agenda” (Hacking 1990, 165).

Durkheim’s notion of normal aligned with Comte’s view of the pathological as a deviation from the norm with a negative connotation. "The normal", however, suggested a

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bell-shaped curve as fundamental indices of the human condition” (Hacking 1990, 110). Quetelet’s strategy quickly spread; “[e]very sort of physical attribute of humans and then of all the animal and vegetable kingdom was investigated and plotted as if according to the law of error” (Hacking 1990, 110). By exporting the law of errors from the astronomical realm into human affairs, Quetelet put forward a new sort of law on the basis of statistics.

[55] By 1844, "[Quetelet] transformed the theory of measuring unknown physical quantities, with a definite probable error, into the theory of measuring ideal or abstract properties of a population. Because these could be subjected to the same formal techniques they became real quantities. This is a crucial step in the taming of chance. It began to turn statistical laws that were merely descriptive of large-scale regularities into laws of nature and society that dealt in underlying truths and causes" (Hacking 1990, 108).

tension, since it connoted both a figure of perfection and the average. At the other extreme, Galton saw positive excellence instead of negative pathology. For Galton the goal should not merely be to pursue the average but to improve it (Hacking 1990, 169). These two views suggested distinct views on progress: normalcy and the perfection of the normal. The two senses, Hacking argues, still lie at "the core of our conceptions of the normal" (Hacking 1990, 171).

3.2.5. The Taxonomic Style

The taxonomic style introduces a new type of statement about the hierarchical organization of living things and taxa as a new type of object of inquiry, but distinguishes from the previous styles in that it does not introduce a criterion for truth. Classifications are not true or false, but apt or inapt.[56] Hacking identifies the origin of the taxonomic style in a transformation in the organization of living entities represented in Linneaus' work (1707-1778). With Linneaus, species became understood as historical entities, subjected to transformation, degeneration, and evolution over long periods of time. Before this transformation, species were studied as if they were outside of time (as having fixed natures) and only incidentally in space (habitat, geography, climate). The field of natural history, which started around Linneaus' time, became a study of the regularities of populations (although they were not called that at the time) organized in space and time.[57] The term "taxonomy"

[56] A system of classification orders a domain of experience according to particular principles and goals other than truth. Foucault's account of Borges's Chinese encyclopedia in The Order of Things may serve to illustrate the point. The passage describes the following classification of animals: " (a) belonging to the Emperor, (b) embalmed, (c) tame, (d) suckling pigs, (e) sirens, (f) fabulous, (g) stray dogs, (h) included in the present classification, (i) frenzied, (j) innumerable, (k) drawn with a very fine camelhair brush, (l) *et cetera,* (m) having just broken the water pitcher, (n) that from a long way off look like flies" (Foucault 1970). In other words, this classification is one part of a constellation of principles that makes a system of classification apt, as an inventory of the Emperor. It shows that systems can have other important merits than truth. A similar point could be made by reference to Goodman's defense of relevant kinds over natural kinds presented in Chapter 1.

[57] This is a characteristic of the second set of Crombie's and Hacking's styles.

was introduced at the beginning of the nineteenth century (around the same time as the term "biology"), replacing the 200-year-old term "natural history".[58]

Two related events mark the origins of the taxonomical style. First, world explorers brought a large amount of "samples" to Europe, specimens collected from sub-Saharan Africa, the Americas, the Spice Islands, India, China, Polynesia, and Australia. This prompted the development of a classification system, modeled on the already existent botanical garden system. Second, Linnaeus established a binomial system of classification for plants.

Although newly imported plants were classified with techniques already used in botanical gardens, it took time for the binomial system to be developed and for the Linnaeus' taxonomic system to crystallize. Linnaeus developed a binomial system along with a series of other people. In particular, Pierre Magnol (1638-1715), a 'demonstrator of plants' at Montpellier's garden,[59] in an attempt to clarify some of the confusions generated by the scholastic view, introduced the idea of the family of plants. Departing from the scholastic genus/species framework,[60] Magnol suggested a higher order category in which plants were organized according to a manageable number of characters or points of resemblance. Although Magnol's category was not widely used immediately after its introduction in 1689, Michael Adanson revived it sixty years later. Perhaps an even more crucial figure than

[58] Hacking separates from Crombie's account of the taxonomic style, following instead Foucault's analysis (Foucault 1971). Hacking observes that William Whewell may have been responsible for introducing the word "systematics" into English as an alternative to "taxonomy." The term became confined to biological classification.

[59] Belleval was personal physician to Henry IV, and received Louis XIII's patronage to re-establish Montpellier's botanical garden (destroyed in 1622). Botanical gardens were a profitable enterprise; at stake was the ownership of the named plants, many medicinal, at home and abroad. Botanical gardens equally served the state and private enterprise.

[60] Hacking notes two different notions of "genus" and "species." Whereas these are relative notions in Aristotelian (scholastic) logic, in Natural History, a genus cannot be regarded as a species. Porphyry's (c. 233-304) introduction to Aristotle's Categories, *Isagoge*, illustrates this point. The genus "substance" includes the body; the body includes the animate body, an animal. Under animal there is man, and under man there are particular men, Socrates and Plato for instance. Body, animate body, and animal are all genus or species depending on the occasion. For example, animate body is a species of body and a genus of animal. The only exception is man, which is a species of rational animal but not a genus of particular men. Genus and species are longstanding notions whose traces are found in "commonsense classification," a hierarchical, three-level system, e.g., bird (more general), owl (type of bird), barn owl (type of owl. Although it initially conceived of these categories as more systematic versions of the previous system, Natural History eventually introduced the tree structures used in modern Systematics.

Magnol was Joseph Pitton de Tournefort (1656-1708), who organized over 7000 species according to 700 genera.

Neither Tournefort nor Magnol were aware of their contribution to a new way of thinking about classification. They saw themselves as simply clarifying the scholastic system. Their work, however, generated a rupture that engendered a larger hierarchy. So as genus became absolute over species, other absolute ranks were envisioned, e.g., species, genus, order, class. As more plants were brought to Europe from different parts of the world, which did not exhibit as many apparent similarities than known plants, new categories of classification were developed and the hierarchy of taxa increased.

The new system of hierarchies of taxa generated a problem: how to rank taxa? Following Aristotle, Andrea Cesalpino (1569-1603) had classified plants on the basis of modes of reproduction: their fruits and flowers. But by 1735, Linnaeus saw more clearly how to resolve the problem. Also focusing on reproduction, he classified plants according to the number of stamens and pistils, which published in a 12-page folio, entitled *Systema Naturæ*. This work culminated in *A General System Of Nature: Through the Three Grand Kingdoms of Animals, Vegetables, and Minerals,* fully completed by 1758.[61] Linnaeus understood his system as a precursor for better ones but it lasted up to date.

Linnaeus is representative of the taxonomic style chiefly because of two of his contributions to the system of binomial nomenclature. The first was syntactic. He made the system canonical and added fuller names on the basis of a sequence of limited attributes summarizing the central characteristics of a species. The nomenclature system consisted of two Latin words, one of which indicated the genus and the other a characteristic of the species. The second aspect was mnemonic. Binomial nomenclature made it easy to recall the location of plants and animals within a general scheme of organization. Although the system initially was applied to botany and was meant only for the organization of organisms,

[61] *Systema Naturæ*. This work culminated in *A General System Of Nature: Through the Three Grand Kingdoms of Animals, Vegetables, and Minerals,* fully completed by 1758.

it soon functioned as a classification model for other fields. For instance, Boissier de Sauvages de la Croix (1706-1777) modeled a disease classification system on the botanist system in 1731.

3.2.6. The Historico-Genetic Style

Like the taxonomic style, the historico-genetic style lacks its own object of inquiry and criteria for truth-telling. Hacking has expressed some contempt in this regard, not because he considers the style invalid but because there is no good theory to account for its soundness and validity. This style is concerned with historical derivation; it examines the origins of "something" that exists in the present or at some point in the past, and explains the way in which it became what it is or was.

Although cosmological models of the origin of the universe have been generated since ancient times, Hacking considers Charles Darwin to be the emblem of the historico-genetic style. Marx and Buffon were contenders, but Hacking picks Darwin due to his legendary standing within the scientific literature, and because in *On the Origin of the Species,* the historico-genetic style began to be clearly concerned with the organization of populations in space and time. With Darwin, the style reached a point at which testable hypotheses, instead of mere speculations, could be formulated. The historico-genetic style does not introduce criteria of truth for the sentences it generates; however, by themselves, such sentences constitute historical claims (presumably) supported by evidence.

The theories of evolution and the Big Bang are two illustrations of the historico-genetic style. The Big Bang theory provides a scientific, twenty-first century story of the origins of the universe, distinct from past stories because it offers a model of the universe. During the early twentieth century, the Steady-State theory propounded by Bondi and Hoyle competed with the Big Bang theory. In 1965, Arno Penzias and Robert Wilson discovered microwave background radiation at Bell Labs, which fit predictions by astronomer Robert Dicke of a trace of an original "explosion," supported the Big Bang theory. This case shows

the transition from mere speculation to experimental testing in how scholars think about the origins of things (i.e., the origins of the universe). The theory of evolution presented in Darwin's *On the Origin of Species* is, in Hacking's view, is the historico-genetic style's greatest triumph. In addition to being a great naturalist and taxonomist, Darwin also presented an historical account of how living things and fossils originated and were distributed through time.

Rather than truth in a given domain, or the rightness or wrongness of classification in the taxonomic style, the aim of the historico-genetic is explanation, and truth is derived from explanation. This explanation speaks to the truth of a conclusion extracted by its means. Therefore, Hacking considers the logic of the historico-genetic style to be a type of inference to the best explanation (IBE). Hacking conceives of IBE as a subjective or psychological notion, providing very weak support for the existence of hypothetical or unobservable entities.

As it stands, the historico-genetic style is the least developed of Hacking's styles. Although Hacking provides a general account of the historico-genetic style, his presentation is sketchy and raises more questions than answers. [62]

3.3. Philosophical theses

Hacking's Styles Project stands apart from other similar works in its philosophical character. By combining Williams' philosophical notions with Crombie's template, Hacking creates a framework from which he extracts further philosophical implications. First, the styles are self-authenticating (although not all of them are equally successful at it). Second, the styles have different levels of successful self-authentication depending on their techniques of

[62] The historico-genetic style raises red flags in Hacking's Styles project, insofar as at least two central characteristics of the styles, the introduction of objects of inquiry and of a criterion of validity, are not met by the historico-genetic style. One of the strengths of characterizing the styles in terms of their introduction of objects of inquiry and criteria of validity is that these distinguish the styles of scientific reasoning from merely scientific methodologies. Furthermore, the historico-genetic style also lacks the epistemic and ontological specificity of the other styles. It is unclear whether it is a style that characterizes scientific reasoning more than it does reasoning in general.

stabilization. Third, the traditional ontological debates in the philosophy of the sciences are the product of the introduction of scientific objects by the styles.

The styles have different levels of successful self-authentication depending on their techniques of stabilization. These techniques are distinct to the criteria of truth and/or validity introduced by each style, but they participate in the generation and validation of knowledge. In the following two sections I elaborate, first, on the notion that the styles are self-authenticating, and subsequently, on their respective techniques of stabilization. The ontological debates about the reality of certain scientific objects (e.g., theoretical and abstract entities) result from the introduction of the kinds of objects associated to each style. Although that fact may not resolve the debates, Hacking argues, it does downplay their significance. Furthermore, the stabilization of a style of reasoning involves developing adequate techniques of stabilization, one of which is clearly specifying its objects of inquiry. Conversely, the instability of a style of reasoning results from the inadequacy or the insufficiency of its techniques of stabilization, and/or the lack of clarity in the specification of its object of inquiry. The mathematical and laboratory styles are the most stable, while the taxonomic and the genetico-historic styles are the most unstable. Each style is stable or unstable in its own ways.[63]

3.3.1. Self-Authentication

The styles originate when they introduce a criterion of validity (or truth) for the sentences they generate. The criteria of the first three styles include truth-telling; the second three do not. The criteria of validity for statistical, taxonomic, and historico-genetic styles concerns something other than truth: probability, rightness of category, and explanation. Given these differences, characterizing the styles and their origins in terms of an introduction

[63] Unfortunately, most of what Hacking has said about techniques of stabilization has to do with the laboratory style; and he has not said much about the specifics of the ontological debates. In this section, I review the three philosophical aspects of Hacking's Styles Project: the self-authentication of the styles, their techniques of stabilization, and the ontological debates brought about by the styles.

of a criterion of validity or truth-telling seems inadequate at face value. The notion of self-authentication, however, captures a critical insight about the validation of scientific claims: different sorts of scientific claims are generated and validated by different means. These include distinct "logics" or methods of reasoning (e.g., mathematical or experimental techniques), and distinct types of evidence (e.g., mathematical, experimental, statistical, etc.). This insight applies to all the styles, regardless of their (lack of) success at producing adequate methods of validation or types of evidence. The claims generated by a style cannot be settled by means of another style's criteria of validity. This is, I think, central to Hacking's view that the styles of scientific reasoning and doing are (all) self-authenticating (regardless of their success).

Ontological distinctions help clarify the self-authentication of the styles: the sentences generated by each style are concerned with distinct sorts of objects of inquiry and require distinct techniques of justification. Claims generated by the mathematical style about abstract entities such as numbers and classes require distinct techniques of validation from those generated by the experimental or the statistical styles. A proof could not validate an experiment. A statistical analysis could not validate a proof. The knowledge claims put forward by different styles are plainly distinct in both form and content. In this respect, the notion of the self-authentication of the styles is reminiscent of Moritz Schlick's articulation of the positivist criterion of verification, according to which the meaning of a statement is its method of verification (Schilck 1936).

The absence of a clear criterion of validation for sentences generated by the taxonomic and the historico-genetic styles, and the contrast between the objectives of the first and second set of styles (truth-telling vs. probability/aptness of classification/explanation) create a difference in their self-authentication. In addition, the second set of styles uses evidence produced by other styles for establishing their knowledge claims. The statistical and the historico-genetic styles may use evidence, for instance, from the experimental style. However, the claims made by these styles differ in form, content, and aim from the originating

styles. In a sense, they bring in outside evidence, turn it into their data, and reinterpret it on their own terms. For example, the results of an experimental drug trial may be statistically generalized for a given population.

The notion of self-authentication also helps distinguish methods of inquiry from the styles of reasoning. Even if it is not easy to articulate a clear distinction between the two, characterizing the styles in terms of their criterion of validity facilitates their separation. Whereas methodologies of research are useful for finding out about a phenomenon in practice, the styles of reasoning are more abstract, serving as general principles of inquiry and framing the validation of knowledge claims produced by different methodologies.

The notion of self-authentication implies—radically—a type of circularity: the styles produce both types of evidence and knowledge claims, and the criterion of validity by which these are established. Such circularity comes out from the fact that the styles do not only produce their type of evidence and knowledge claims, but also the criterion of validity by which these are established. They introduce a class of sentences as candidates for a truth/value, and they also establish what counts as true or false. In other words, the logical and evidential adequacy of a sentence can only be determined in terms of the style that produces it. This type of circularity, in Hacking's view, is far from being relativist in the sense of lacking standards of truth and objectivity, or understanding the criteria of validation introduced by the styles as merely convenient conventions. On the contrary, it helps explain the sort of objectivity achieved by the styles, achieved in part by producing adequate techniques of stabilization of their objects of inquiry.[64]

[64] One may argue that Hacking's styles presuppose a form of epistemic relativism. Baghramian and Carter characterize epistemic relativism with three main assumptions: (a) framework-relative epistemic justification, which is the view that beliefs could only be justified within an epistemic system; (b) that there are many equally valid, and even incompatible, epistemic systems; and (c) that there is no non-circular way to uphold one epistemic system as superior to another one (Baghramian and Carter 2016). The styles of scientific reasoning clearly do not presuppose (b) and (c). Against (b), one central point of the styles is that they are intended as exhaustive of the distinct mode of reasoning in the sciences. Each of them concern distinct domains of knowledge and reality, so that there is no simple way in which one could say that they are better than others or that they are alternative epistemic systems. The styles are intended to capture a limited plurality of modes of reasoning in the sciences, each concerning

3.3.2. Techniques of Stabilization

Each style possesses distinct, advanced techniques of stabilization and different levels of development. Better techniques of stabilization are marked by a style's ability to self-authenticate, or self-seal.[65] The mathematical, hypothetical modeling, experimental, and statistical styles have established more adequate techniques of stabilization than the taxonomic and historico-genetic styles.

Hacking discusses stabilization primarily in terms of the laboratory style, which at least to a point serves as a model of stability for the other styles.[66] Here, he responds to Kuhn's revolutionary model of the development of science, which posited radical breaks followed by revolutionary periods in which knowledge and practices are highly unstable.[67] Hacking believes that despite these conceptual breaks, there is continuity in the styles of reasoning and doing, the modes of producing and validating knowledge, and the practices around them.

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distinct types of objects of inquiry and validating its knowledge claims about such objects through their own criteria of validity. This may suggest that the styles presuppose (a) insofar as the validity of scientific knowledge claims is relative to the epistemic framework provided by them. This form of epistemic relativity is seen as undermining the possibility of objectivity, insofar as the justification is seen as dependent on the epistemic framework (rather than an external objective reality). Hacking's account of the styles, nonetheless, can avoid this concern by acknowledging that each of the styles introduced their own objects of inquiry, and providing a detail account on how such objects came into being as the relationship between the development of epistemic resources, human cognitive capacities, and reality.

[65] In a comment to this work, Prof. Dinishak pointed out that the idea that the styles are self-sealing suggest the insulation, which appears to be in tension with other aspects of my presentation of the styles such as the ideas that the styles could borrow from one another and that there are continuities between them. This observation calls for some clarification. The idea that the styles are "self-sealing" certainly suggests that they are insulated. This is the case in the sense that each of them concerns distinct objects of inquiry, introduce their own criteria of validation, and the claims produced by them are stated in their own language. The claims concerning the objects of inquiry of one style have no sense within the confines of another style. The sense in which there is continuity between the styles or in which some styles borrow from others does not go against the idea of the styles being sealed. Although the statistical knowledge on a given population may give rise to the introduction of a hypothetical or experimental object of inquiry, the two types of objects -the statistical and the experimental- and the knowledge claims produced about them are confined within their own styles.

[66] Hacking claims that his view on the stability of the laboratory style is descriptive rather than normative: "I shall repeat this, because I am regularly misunderstood: This paper does not praise stability. It does not imply that stability is a good thing. It does not admire stability. It observes it and tries to explain it" (Hacking 1992b, 38).

[67] Note that this is only a partial reply since, in Hacking's view, not all the styles are as stable as the laboratory style. Hacking also notes that his view on laboratory science address short-term, or "frontier research," but the general picture that forms in the long term (similar to Crombie's *longue dureé*).

In “The Self-Vindication of the Laboratory Sciences” (Hacking 1992b) Hacking presents a taxonomy of the elements in an experiment which, through their mutual adjustment, generate the self-vindicating character of laboratory science. Hacking groups these elements into three distinct categories: (i) *ideas,* or “the intellectual components of an experiment”; (ii) *things,* such as instruments and substances; and (iii) *marks*, covering a number of items such as inscriptions, “visible impressions,” and “written or printed signs or symbols” (Hacking 1992b, 44). Ideas and things are easy to distinguish. Marks and things are more difficult to differentiate; for instance, instruments, the data they generate, and the analysis of this data are often tightly interwoven.

Under ideas Hacking includes: (a) traditional questions concerning the truth/falsehood of the theories of a given inquiry; (b) the measurement of entities, processes, substances, etc., which are involved in inquiry and its impact on their treatment; (c) background knowledge and expectations assumed in practice, which do not form a part of the theoretical apparatus; (d) systematic theory, generally abstract in character and with or without experimental consequences on its own; (e) topical hypotheses concerning the (systematic) connection between theory and phenomena (i.e., in Hempel’s language, bridge principles, although Hacking does not consider them “principles”);[68] and (f) background knowledge, both theories and common lore, concerning the instruments and apparatuses used in inquiry (Hacking 1992b, 44-46).

Under things Hacking includes (a) the target of inquiry, such as a substance or population; (b) “sources of modification” like apparatuses, instruments, or tools that interfere with the target (e.g., substances used in the preparation of an object in experiment); (c) detectors, which measure the interference or modification of the target; (d) data generators,

[68] “The connections I have in mind are too revisable for me to speak of principles or a dictionary. I call them topical hypotheses. Hypothesis is here used in the old-fashioned sense of something more readily revised than theory. It is overly propositional. I intend to cover whole sets of approximating and modeling procedures in the sense of Cartwright (1983), and more generally the activity that Kuhn (1962, 24-33) called the "articulation" of theory in order to create a potential mesh with experience” (Hacking 1992b, 45).

which may be machines such as Atwood's machine and micrographs, or people who are in charge measuring a target or source of modification.[69]

Under marks Hacking includes (a) data or "raw data," including "uninterpreted inscriptions, graphs recording variation over time, photographs, tables, displays";[70] (b) distinct kinds of data processing such as data assessment, including calculating probable error and estimating systematic error (both of these require a sufficient background knowledge of the apparatuses and statistical and non-statistical techniques); (c) data reduction, by which a large amount of numerical data is turned into a manageable number through statistical or computational techniques; (d) data analysis and interpretation, which are based on the (i) focus of the research questions, (ii) theoretical background, including systematic theory, (iii) topical theory, and (iv) apparatus modeling.[71]

Hacking's taxonomy is not rigid. He recognizes that not every experiment includes every element, and that some elements may be amalgamated. He also takes a flexible view of the initial state of experiment. Although a great deal of knowledge, tools, and techniques must already be in place in order for the experiment to begin, these may change over its development.[72]

The final and most important components of Hacking's taxonomy are "the experimenters, their negotiations, their communications, their milieu, the very building in

[69] According to Hacking, "there is no need to insist on a sharp distinction in all cases between detector and data-generating device. In the early days a camera taking micrographs from an electron microscope was a data generator that photographed a visible image for study, analysis, or the record. Today the camera is more often the detector; the data generator may be a scanner working from the micrograph" (Hacking 1992b, 48).

[70] Although in Hacking's view "[i]n the laboratory nothing is just given. Measurements are taken, not given. Data are made, but as a good first approximation, the making and taking come before interpreting. It is true that we reject or discard putative data because they do not fit an interpretation, but that does not prove that all data are interpreted" (Hacking 1992b, 48).

[71] "Pulsars provide an easy example of data interpretation requiring theory: once a theory of pulsars was in place, it was possible to go back over the data of radio astronomers and find ample evidence of pulsars that could not have been interpreted as such until there was theory. The possibility of such interpretation also mandated new data reduction (12) and analysis (13), and the systematic error part of the data assessment (11) had to be reassessed" (Hacking 1992b, 49).

[72] Hacking does consider "themata" and "thematic presuppositions," to be rigid. "Expectations about how the world is like and practices of reasoning about it" govern theories and the interpretation of data (Hacking 1992b, 50). The laboratory style, generally characterized by methods of reasoning and objects of inquiry, falls into this category.

which they work or the institution that foots the bills" (Hacking 1992b, 51). Hacking also includes authors, authority, and audience. This last set of elements, in contrast to the previous three, is "external" rather than "internal" to an experiment.

Hacking notes the interplay between the different elements included in his taxonomy.[73] Each element, from questions to experimenters, can be modified to fit each other in case of conflict.[74] Hacking's circularity extends Duhem's thesis by adding a series of *material* elements as a part of the interplay, including "data, theory, experiment, phenomenology, equipment, data processing" (Hacking 1992, 54). In addition, it aligns with Goodman's famous view that "[a] rule is amended if it yields an inference we are unwilling to accept; an inference is rejected if it violates a rule that we are unwilling to amend."[75]

The mutual adjustment of theories, laboratory equipment and experimental practices generate the self-vindication of laboratory science. Such stability does not merely come from the object of study (either understood as theory-free or value-free nature or the phenomena created as a product of laboratory science), but is "a contingent fact about people, our scientific organizations, and nature" (Hacking 1992b, 56). In other words, while nature plays a role, it is not sufficient for the stabilization of laboratory science. Moreover, stability is not automatically a virtue: it may also be a sign of stagnation. Hacking resolves this tension by positing "the noblest stability," occurring when "a science that has been surpassed by deeper enquiries and new types of instrumentation… remains humbly in place as a loyal and reliable servant for our interventions in, our interactions with, and our predictions of the course of events" (Hacking 1992b, 37).

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[73] On this Hacking agrees with Duhem, Ackerman, and Pickering: "Pickering attends to the modeling of the apparatus and the working of the instruments: we acknowledge data as data only after we have gotten handmade apparatus to work in ways that we understand. Duhem emphasized the intellectual elements [under ideas]. Ackermann, observing that data can be understood in many ways or not at all, put the emphasis on a dialectic involving theories and interpretation, regarding instruments and the data that they produced as fixed points. We should learn from all these authors" (Hacking 1992b, 54).

[74] "We can (1) change questions; more commonly we modify them in mid-experiment. Data (2) can be abandoned or selected without fraud; we consider data secure when we can interpret them in the light of, among other things, systematic theory (3)" (Hacking 1992b, 54).

[75] Here, Hacking reminds us of Goodman's dictum (Hacking 1992b, 54)

3.3.3. Ontological Debates

The introduction of new types of objects of inquiry by the styles generates distinct ontological debates. This occurs in part due to the way in which (European) languages work. Hacking illustrates this with three examples: the debate between Platonists and anti-realists on the ontological status of abstract objects, traditionally discussed within the philosophy of mathematics (mathematical style); the debate on the existence of theoretical entities (scientific realism vs. instrumentalism) in the traditional philosophy of science or the philosophy of physics (laboratory style); and the debate concerning the reality of taxa (the taxonomic style).

The statistical and historico-genetic styles are two exceptions to this ontological view. Hacking does not cite any debates about the ontological status of populations—the object associated with the statistical style.[76] Nor does he recognize a specific debate in the historico-genetic, since no object is clearly associated with that particular style.

The styles do not "create" their objects, but they "introduce" them within their domain in such a manner that they have no place outside of them. Neither the kinds of objects (e.g., a theoretical entity) nor the individual objects comprising those kinds (e.g., positrons) are specific outside of the styles. In that sense they only "exist" within the styles.[77]

When the styles of scientific reasoning introduce new types of objects, this generates ontological debates. This, in turn, changes the conception of such debates and their philosophical significance. The Styles Project, furthermore, provides an alternative view of why the ontological debates "are so enduring, and why they are so irrelevant to scientific practice" (Hacking 2009a, 23).

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[76] A distinct but related debate in the statistical style concerns the interpretation of probability theory; namely, the debate between the subjective, frequency, and propensity interpretations of probabilities.

[77] Hacking distinguishes the ontological debates about the existence of scientific objects from other more comprehensive ontological debates in philosophy, such as those concerning the existence of an external world or other minds. Concerning the external world, for instance, the styles do not deny its existence.

According to Hacking, the styles' generation of ontological debates is due in part to the way in which European languages work. In particular, Hacking argues that European languages have the tendency to presuppose the existence of the entities referred to by names, including scientific entities, as if they picked out objects in the real world. In addition, European languages tend to include those names as the subjects of sentences presumed to be knowledge claims (Hacking 2009a, 23). That is, the objects of scientific discourse tend to be reified, which in turn produces ontological questions.

It seems relativistic to suggest that the existence of objects of inquiry is internal to the styles. However, Hacking conceives of this view as "profoundly rationalist in character," since the thesis of self-authentication explains the objectivity of the styles. Hacking treats the notion of "objectivity" as an epistemic concept, according to which "the truths discovered in the sciences are true, independent of what we think, or of how we discover them" (Hacking 2009a, 24). Such a view of objectivity is not inconsistent with the styles, as shown by Williams' distinction between truth and truthfulness. The styles merely introduce the "truth conditions" by which the sentences produced should be evaluated (rather than truth itself). Moreover, the styles do not "create" their objects of inquiry; rather, they bring the objects into scientific discourse.

Despite the epistemic and ontological distinctions between styles, different styles can and are used across disciplines. Hacking has said very little about how distinct disciplines, or, more importantly, interdisciplinary studies of phenomena, call upon the styles.

3.4. Making Up People and the Styles of Scientific Reasoning

The styles of scientific reasoning, Hacking argues, provide a sufficient and parsimonious picture of the rationalities operating in the sciences. Each style introduces its own objects of inquiry and criteria of validity, and produces distinct techniques of stabilization. Each scientific field, including the human sciences, can use whichever style best fits its research agenda. How this takes place, however, is neither specified nor obvious. Despite

the apparent relevance of the styles of scientific reasoning to the analysis of categories of people, Hacking has not elaborated on any of the links between the two projects.

I have so far presented an overview and analysis of the MUP and Styles Projects. In this section, I explore the philosophically relevant connections between Hacking's projects. I structure this exploration according to philosophical domain, beginning with logic, continuing with epistemology, and concluding with ontology. This illuminates how the Styles Project framework informs a philosophical analysis of how the human sciences categorize people.

3.4.1. Logic

Both of Hacking's projects endeavor to reveal the underlying rationality operating in the sciences. The Styles Project evaluates the validity of distinct types of knowledge claims, and the MUP Project evaluates the validity of the classifications of people. Although one might expect knowledge claims with a scientific pretense to belong to the discourse of one style or another, the validity of a given category of person is not established by any one style's rules in isolation. Insofar as the knowledge claims are presumed to be scientific, there is an overlap between the styles and MUP—and yet, the two are very distinct creatures. The domain of a style's discourse may only partially specify the domain of a given category of person. Because of this, as it concerns the categories of persons and despite the differences in the development of the styles, no style has priority over any other. The validity of a category of person is not reducible to the validity of the knowledge claims of any style. Additionally, when considering the looping effect, it seems plausible that determining the *modus operandi* of the formation of categories of people—a "logical" task—is not exhausted by combining the styles. The phenomenological component contributed by the people who live within the categories gets to the core of the scientific enterprise: the determination of their validity.

Each style introduces both the type of "sentences" that are candidates for truth values and the criteria for determining their truth. If Hacking's premise is correct and the six

styles indeed provide a sufficient account of scientific rationality, then the validity of any knowledge claim would be expected to fit within the scope of a style, and the rules developed within that style would be expected to determine its truth and validity. However, truth and validity apply only internally, and as such, a style has neither authority nor priority over other styles. The differences in the criteria of truth and validity from style to style also suggest that reducing one to another is not possible. The styles are incommensurable; although they share some philosophically relevant features, they do not share a common measure.

Just as different styles are called upon in categorizing people, different scientific domains—established by the styles—constitute the domain of a category of person, and each style's distinct criteria of truth and validity participates in its validation. Considering the framework provided by the styles, some questions arise concerning the relationships between the styles and the roles they play when they combine to categorize people. If the domain of each style is distinct, how can they come together to constitute the domain of a category of person? If the validity of a style is internal to it, how can it be extrapolated outside of it? How is it possible to determine if the statements produced by one style are consistent with the statements produced by another, if truth and validity are internal to each of them? If they do not share the same domain of discourse, how can different styles be called upon in the scientific categorization of people?

These conundrums echo those generally posed in response to Thomas Kuhn's and Paul Feyerabend's views on the incommensurability of paradigms and comprehensive theories, as well as to Ludwig Fleck's earlier work on the incommensurability of distinct "thought styles." This should be no surprise, as Hacking's work is heavily influenced by all three. The solution to these seemingly puzzling questions is found in a more comprehensive view of rationality: one provided by Nelson Goodman's notion of relevant kinds.

The categories of people are cross-cutting. Their validity cannot be established by "the logic" of a style alone, without taking into account extra-logical—i.e., pragmatic—considerations. Categories of persons show how different systems of classification coexist

and can cut across one another. The way in which the styles cross-cut into them is not fully explained by logic. Since a particular kind of person cannot be reduced to a single style's domain of discourse, more than one style is generally needed to understand a category.[78] Categories of people, conceived as objects of inquiry in the human sciences, are complex domains and must possess the ability to operate within multiple styles. Furthermore, while the validity of the styles does confer validity to scientific categories of persons, this validation process is complicated by the presence of looping effects.

In any case, it seems to follow that the domain of discourse of a category of person is constituted by sets of sentences compartmentalized according to the styles in which they are expressed; and that any sentence falling outside the styles can be discarded as unscientific with its true value remaining at least undetermined, if not false. Conversely, any claim about a category of person established by a style has limited truth and validity.

3.4.2. Epistemology

The six styles of scientific reasoning reveal a heterogeneous image of scientific knowledge. The ways of "finding out" and the types of evidence admitted by the styles shape the scientific understanding of categories of people. Advances in the understanding of categories of people result from improving the styles' epistemic resources and applying them successfully when studying the associated phenomena. The availability and recognition of evidence within a style sets the stage for the type of knowledge claims that can be formulated, and the truth or falsehood of a given knowledge claim can only be determined

[78] Following the logic of the styles as informing MUP brings up critical questions. Take, for instance the case of addiction in which multiple scientific domains are involved. The statistical and laboratory styles are clearly at play in epidemiological, pharmacological, and genetic studies - to mention some relevant domains. However, some other domains of study are less clearly accounted for by the styles, e.g., psychodynamic, cognitive and social aspects that generally play a role in clinical descriptions. These may be accounted for within the historico-genetic style, of which Hacking gives only an incomplete picture of, or possibly the hypothetical modeling style as these may involve the generation of sorts of hypothetical models (e.g.. cognitive), or lastly they may hint to the need of another style of scientific reasoning, which Hacking does not account for. However, how we regard the sorts of reasoning involved in psychodynamics is beyond the purview of this work.

according to the criteria established by it. As such, the knowledge claims that fall outside a style either pose new puzzles for, or contain a critique of the styles. The use of different styles is limited both by their development and by technological advances (or the lack thereof) in the study of people.

Each style develops different types of knowledge. However, the type established by one may prompt the development of new types by other styles. In the case of categories of people, the development of the statistical style and its application to the study of human populations set the stage for their scientific study. This brought about the very idea of ideal types of human beings: Quetelet's "average man" and Durkheim and Galton's "normal man." As the statistical style was stabilized, a type of man was normalized, and those falling far from its norm were pathologized. Pathological types, the deviant or abnormal, were turned into their own objects of study—then became available for other styles to study. Extrapolating from Hacking's MUP Project, such studies are generally undertaken via the laboratory style, which informs medical thought and practices.

The study of types of persons, normal or pathological, is both driven and made possible by social perceptions of what is acceptable, problematic, or wanted. Being short in height may not be desirable, but it is generally acceptable, at least in the present moment in time. Crime, poverty, and mental illness are seen as problematic and therefore necessary to control, prevent, or eradicate. Intelligence, creativity, and healthy bodies are desired; thus, studies are conducted on how to foster them. Moreover, when the looping effect occurs, the people affected by particular knowledge claims in turn impact how scientists think about them. One paradigmatic example is the transformation in the scientific conception of homosexuality from unlawful to pathological to acceptable. Furthermore, the people so classified also vindicated the knowledge associated with this category by acknowledging that it provided a framework for reinterpreting their experiences.

Interestingly, looping effects introduce a level of destabilizing noise to the stabilizing effects of the styles. Conversely, when people inside a category accept certain knowledge

claims associated with it, this increases the perception of stability. The sciences use the styles in an attempt to stabilize phenomena. However, the people placed into scientific categories actively interact with them, alternatively fixing (stabilizing) and changing (destabilizing) them for their own purposes.

The knowledge established by one style is both built upon older knowledge established by other styles, and sets stage for subsequent studies undertaken by other styles. For example, the statistical and laboratory styles interacted to create the category of Multiple Personality Disorder: once the correlation between child abuse and multiple personality disorder was established, a putative underlying bodily causal link was sought out and supported on the basis of animal trauma models.[79]

3.4.3. Ontology

The styles of scientific reasoning introduce their own objects of inquiry that remain confined to the boundaries of their particular style. According to the MUP Project, the categories of people worked out by the human sciences also assume or imply a differentiated ontology of persons, in which human beings are allocated according to distinct types. Both the Styles Project and the MUP Project make their own ontological claims about the objects of science. The objects of the styles and the objects of the categories of people are both

[79] Although psychoanalytic theory played a more prominent role in the making of MPD, studies on trauma may also have a minor influence. This is at least suggested in a discussion on the "psychobiological" dimension of MPD attributed to Frank Putnam (Hacking 1995a, 85): "T]he link between MPD and child abuse was sought on the underlying biological mechanisms of trauma. Psychobiological? Thus far, no biological concomitants specific to multiple personality have been sustained. Putnam's sentence is intended to get at two distinct propositions. First, there is a systematic connection between multiplicity and childhood trauma. But why is that psychobiological? The answer lies in a second proposition from the traumatic stress literature. Something is known about the brain chemistry of terrified animals. Rats subjected to inescapable electric shocks are paralyzed by fear, and this reaction is correlated with the depletion of important brain chemicals. Moreover, the behavior of the rats is said to resemble that of war veterans diagnosed with post-traumatic stress disorder. From a study of "the psychobiology of the trauma response," [Frank] Putnam quotes the assertion that "the symptoms of hyper-reactivity (i.e. startle responses, explosive outbursts, nightmares, and intrusive recollections) in humans resemble those produced by chronic nonadrenergic hypersensitivity following transient catecholamine depletion after acute trauma in animals." It is a reasonable research guess that human hyperreactivity (psychological) is paralleled by chemical changes in traumatized rats. But it is not knowledge."

scientific, and yet it is not obvious whether the respective scientific ontologies coincide with or are distinct from each other. Here again, a puzzling situation gives rise to some questions. Given a category of person and its subdetermination by different styles, how many scientific kinds of entities are implied in such a category? Is one kind of man/object or many distinct kinds of scientific objects brought together to characterize a kind of man? The ontological view posited by the styles suggests multiple scientific worlds inhabited by different kinds of entities; and yet, distinct styles are called upon in the characterization of a particular kind of people. While each style has a unique object, boundaries, and court of appeal, ultimately, all still are participating in the constitution of the object of human sciences.

How then do the two ontological pictures relate to each other? Here again, the Goodmanian notion of relevant kinds provides a useful framework: the objects of kinds of people are scientific motely entities, cross-cutting categories characterized by distinct scientific taxonomic classes. Furthermore, the historical character of both the styles of scientific reasoning and MUP also suggests another node of connection. Kinds of people comprise scientific ontologies. As they are introduced within scientific discourse, types of being human emerge as scientific objects framed by the styles of scientific reasoning. These two ontological pictures do not exclude each other, although Hacking has not yet fully fleshed out the ways in which they complement each other.

In practice, distinct scientific disciplines utilize different styles to understand their object of inquiry. Sociology and genetics, for instance, may use the statistical and laboratory styles in their study of crime. Each of Hacking's MUP studies demonstrates how the statistical style introduces kinds of people as scientific objects into the scientific discourse. This, in turn, opens the door for the subsequent introduction of nested scientific objects, in which hypothetical, experimental, and laboratory styles further characterize the statistical style's types of men. Using different styles, each scientific disciplines studies distinct scientific objects that nonetheless all fall under the category of person. The statistical style is not only crucial because it introduces kinds of persons as scientific objects, but because it bridges

distinct scientific taxonomies—types of populations, types of behaviors, types of memories, types of brain mechanisms, types of metabolisms, types of genes. The objects of the hypothetical, experimental, and laboratory styles, in a sense, surface from “the world” of the statistical style. Statistics allows the various objects across the “worlds” to form a singular, if motely, entity—a scientific kind of person.

By systematically counting people according to traits of interest (crime, suicide, etc.), norms begin to emerge alongside whole new kinds of persons. The bodies of the kinds of persons emerged by statistical means are then studied using other styles (hypothetical modeling, laboratory experiments, historical research, etc.). Next, they are characterized further by their other constitutive parts, which are the other styles’ objects of inquiry (theoretical and experimental entities, such as putative brain and genetic models). Each of these styles observes its own object and validates aspects of it in accordance with its own rules; yet it continually refers back to the entity initially disclosed and supported by the relevant statistical results. Technological advances, changes in scientific taxonomies, developments in the social milieu of the populations studied and the perception of them, prompt continual revisions of the knowledge associated with the kinds of persons under study. These knowledge revisions may be accompanied by ontological transformations.

The looping effects that shape categories of people have another ontological outcome. Kinds of people are dynamic kinds, not only because of changes in scientific taxonomies or developments in technology, but because of the ways in which people themselves change, affecting the further development of these taxonomies.

Hacking's styles of scientific reasoning offer a distinct view on traditional themes in the philosophy of the sciences. They present a historically grounded picture of the rationalities at work in the sciences, and their role in the introduction of criteria of validity of knowledge and scientific objects. In this chapter I recounted the origins of each of the styles envisioned by Hacking, their philosophical background, and the figures in the history of science which Hacking views as exemplars of these styles. I suggested a possible

connection between the styles of scientific reasoning and making up people. Moreover, the ontological and epistemological significance of the styles was explained, as types of reasoning that create certain objects as well as asserting the epistemic criteria for making truth claims about that object. In the following chapter I recount and respond to some representative criticisms of Hacking's account of human kinds.

Chapter 4

Criticisms & Replies

In this chapter I review some critiques that have been raised against Hacking's account of kinds of “making up people” and, on the basis of my earlier development of Hacking's analytics of MUP, I offer a response to these critiques. My discussion includes those posed by Rachel Cooper and Muhammad Khalidi against Hacking's characterization of human kinds on the basis of looping effects, Jonathan Tsou's rejection of the view that all human kinds are unstable objects, and Dominic Murphy's rejection of Hacking's semantic approach to overcoming the conflict between the two competing explanatory models of mental illness represented by the medical model and the biopsychosocial model.

All the criticisms discussed target Hacking's intended "semantic resolution" between scientific realism and social constructivism in the context of mental illness presented in *The Social Construction of What?* Although Hacking has abandoned the use of some of the terminology introduced in that piece, the criticisms presented are still relevant since they target notions that remain in subsequent formulations of the account. All the critiques concern the characterization of kinds of people as subjected to looping effects, and the resulting view that kinds of people are unstable objects or "moving targets", and the relation of such views to some traditional philosophical issues such as natural kinds, causation and explanation.

Although each of the critiques emphasizes different aspects of Hacking's account, the response to all of them comes from a common source: the philosophical background articulated in chapter 1. Specifically this relates to Hacking's understanding of kinds of people as relevant kinds, his pragmatic understanding of causality and scientific ontology, and (less directly) the possible role played by styles of scientific reasoning in MUP. That is, the solutions to these critiques can then be found implicitly or explicitly in Hacking's larger body of work, and by systematizing his projects we can see that the problems raised can either been dissolved or posed in a different manner.

The chapter is divided in three sections. First I review Cooper's and Khalidi's rejection of Hacking's characterization of the looping effect on the basis that the sense of awareness it employs fails to differentiate human kinds from other kinds, remarkably, natural kinds. Second, I examine Jonathan Tsou's argument that Hacking's characterization of kinds of people as "moving targets" constitutes a hasty generalization from the looping effect. Third, I respond to Dominic Murphy's rejection of Hacking's semantic strategy to connect the natural and the social, in which he argues that Hacking's strategy involves an inconsistency with either a) Hacking's own account of the social forces involved in the production of the manifestation of mental illness, b) the causal story associated to the semantic view borrowed from Putnam, or c) the psychiatric understanding of the classification, which does not admit essences.

I will argue that a fuller understanding of Hacking's projects and claims should satisfy these critics. Cooper and Khalidi misinterpret the role which awareness plays in looping and the role which intentionality plays in awareness. Tsou's critique can be addressed by drawing upon the complexity of forces behind the stabilization of particular categories, which often extend outside of the domain of scientists. Finally, Murphy's critique can be addressed by recognizing the fact that Hacking's project does not make any metaphysical claims about the nature of causality, nor does Hacking seek to solve problems in scientific explanation.

4.1. Critique 1: The looping effect is not unique to "human kinds"

Rachel Cooper and Muhammad Khalidi argue against Hacking's view that the looping effect is unique to human kinds. Following a similar argumentative strategy, Cooper and Khalidi offer a series of counterexamples intended to show, on the one hand, that there are some non-human kinds that present looping effects and, on the other hand, that there are some human kinds that do not present looping effects. Cooper's and Khalidi's respective arguments primarily target the notions of "self-awareness" and "intentional action" that figure in Hacking's characterization of the notion of the looping effect, however drawing distinct

conclusions (Cooper 2004 and Khalidi 2010). While Khalidi extracts a challenge to the realist view that there are mind-independent kinds in nature, Cooper finds support for the realist view that at least some human kinds might be natural kinds. In this section I first review Cooper's and Khalidi's respective discussions on the notion of awareness and its role in the looping effect, and subsequently offer a response to their critiques.

In her interpretation of the looping effect, Cooper emphasizes Hacking's appeal to G.E.M. Anscombe's account of "intentional action", which she takes to be central to the view that the descriptions of kinds of people introduced by the human sciences make it possible for the people they characterize to act intentionally. In support of her reading, Cooper quotes Hacking saying that "[i]n creating new terminology, the human sciences would make it possible for people to act in new ways" from which she infers that in Hacking's account "descriptions are required for intentional action" (Cooper 2004, 81). She nonetheless argues that Hacking's characterization of the looping effect is inadequate since, in Anscombe's account, intentional action does not require descriptions.

In Cooper's reading, the looping effect occurs at two levels, one conceptual and one cultural. At the cultural level once a scientific description enters popular culture it may prompt changes in the behavior of the people it describes. The concept of "obesity," for instance, may produce negative feelings among young women, prompting them to start dieting and exercising as to avoid being labeled "obese" (and the negative connotations associated to such a label). Cooper identifies Anscombe's notion of "intentional action" to be at play at the conceptual level of the looping effect. To explain this she discusses the following example: "Consider Ug the caveman, sitting in his cave at the dawn of time before language developed. According to Hacking, Ug cannot intentionally light a fire, go outside, or hum himself a tune—as there are no descriptions, Ug must wait for them to develop before he can intentionally do anything" (Cooper 2004, 82). In her discussion of this passage, Cooper notes two possible interpretations of the clause 'under a description' that characterizes Anscombe's notion of intentional action and Hacking borrows in his characterization of the looping effect:

first, since hypothetically language has not been developed and there are no descriptions available, along Hacking's interpretation, Ug the caveman could not act intentionally, and; second, 'under a description' could be understood, along Anscombe's account, as an action "qua" a description.[80] To determine whether or not Ug's actions are intentional one would have to attribute to him certain intentions rather than others. Ug could intentionally bang some flints "qua a way to make a fire" to warm himself up if he is cold, or "qua a way to make a noise" if others around him are playing drums (Cooper 2004, 82). By understanding "under a description" as equivalent to "qua", Cooper argues, Anscombe's account allows for "other ways in which we can decide what it is that he [Ug] intends to do" than only through a Why Test, in which he would have to provide his reasons for acting the way he does. Cooper suggests that to determine whether an action is intentional in the second sense, it may suffice that a third party is able to attribute the intention to someone else's action on the basis of their overt non-verbal behavior.

Cooper appeals to Anscombe's discussion of intentional actions in non-verbal agents to further articulate the view that determining intentional action could be determined without "descriptions" in the sense in which Hacking suggests, such as through the attribution of motives to an agent by a third party:

> [Consider] a bird which lands on a twig that happens to be both covered in bird lime and near some seeds. The bird […] lands on the twig with the intention of reaching a seed but not with the intention of landing in the bird lime. We infer the bird's intention by attributing intentions that are appropriate for the bird given its perceptual apparatus, its intelligence, and typical bird behavior. We think that birds can identify seeds, that they get hungry, and that typically birds try to get seeds, and so we attribute the intention of getting the seed to the bird. (Cooper 2004, 82).

This example shows, in Cooper's view, that intentional action is not unique to human beings. Intentional actions can be performed insofar as observers can infer the intentions of the

[80] "A may, qua B, receive such-and-such a salary and, qua C, such-and-such salary" (Anscombe 1971, 208, quoted in Cooper 2004, 81).

agent.[81] Against Hacking, Cooper's counterexamples aim to show that a third party can infer the intentions behind the action of an agent without requiring that the agent is aware of such intentions. The bird in the example acts intentionally, despite lacking awareness of the intention of its action. Its action is intentional because we, as observers, could attribute intentionality to its action on the basis of our knowledge of bird and their behavior. Furthermore, the bird does not require a description of its action, as laid out in a concept of birdy behaviors, to intentionally act the way it does. That is, awareness of being of a kind is also not required for intentional action. Since neither being aware of acting intentionally nor being aware of being of a kind is required for intentional action, Hacking's characterization of the looping effect by appeal to Anscombe's notion of intentional action could not serve to distinguish between human kinds and natural kinds. So Cooper states, "Ug can intend to make a fire, and the bird can intend to land on the twig, without any descriptions being required. In such cases Hacking is simply wrong to claim that descriptions are required for intentional action" (Cooper 2004, 84). Thus, if the looping effect is characterized in terms of the presence of intentional action, then humans and non-humans alike could be subjected to the presence of looping effects (Cooper 2004, 82). Cooper, however, is not interested in extending the notion of looping effect to animals or other kinds, but only to show that natural kinds and human kinds could not be told apart by reference to the presence of looping effects in human kinds. Intentional action, which characterizes the looping effect as Cooper understands it, is not unique to human kinds.[82]

Like Cooper, Khalidi rejects Hacking's inclusion of awareness in the characterization of the looping effect, contending that this either trivializes or obscures the notion of interactive

[81] "The conditions under which an intentional action can be performed are identical to the conditions under which an observer can infer the actor's intentions" (Cooper 2004, 82)

[82] Cooper's argument assumes that, for Hacking, language and awareness are intimately linked, and that the distinction between human kinds and natural kinds rests on this. Cooper wants to critique the distinction between natural and human kinds and she thinks that undermining the importance of language in awareness and intentionality achieves that. To be conceptually aware of one's kind depends on being able to understand a language, but Anscombe shows that such conceptual self-awareness is not necessary for intentional action. Thus, Cooper thinks that Hacking's appeal to Anscombe does not do the job he thinks it does.

kinds. If taken at face value, the characterization of the looping effect on the basis of awareness reduces all interactive kinds to human kinds since, as Khalidi notes, "arguably only humans (and perhaps some animals) can be aware of what is being done to them" (Khalidi 2010, 348). On the other hand, if the characterization of interactive kinds is not trivial, then the sense of awareness that figures in the characterization of the looping effect would require further clarification. Following this route, Khalidi considers three possible interpretations. In one of these, those classified are fully aware of the kind-concept under which they are classified. In a second interpretation, those classified may only be aware to a certain degree of their being classified. In the third interpretation, awareness is required but only by proxy; it is not the classified but only those around them who are required to be aware of the kind-concept.

Khalidi notes that the first of these possible senses of awareness is stronger than what Hacking's exemplars of the looping effect exhibit. Since only the strong sense of awareness is unique of human beings, Khalidi argues, the looping effect could not be held as exclusive of human kinds. The categories of "refugee women" and "multiple personality disorder" serve Khalidi to show that the strongest sense of awareness is not exhibited in Hacking's examples of the looping effect, and the other two possible senses of awareness that may be at play are not unique of human beings.

In the first case, women who may not speak the language in which the concept of "refugee women" is articulated, may still "acquire the characteristics of women refugees precisely because they are so classified" (Hacking 1999, quoted in Khalidi 2010, 349). In the case of multiple personality disorder, individuals identified as "multiples" may not explicitly be aware of their diagnosis or their psychological characteristics. Despite the lack of awareness of the kind concept or its associated descriptions, Hacking considers that the two cases exemplify the looping effect. This shows that the sense of awareness at play in the looping effect is not as strong as to require that the individuals classified are aware of the kind-

concept under which they are labeled (first sense of awareness) or of its associated descriptions (second sense of awareness).

The second sense of awareness does not require a "grasp of a certain set of beliefs" but only that the individuals classified have some understanding of what is done to them. For instance, the individuals classified may only be aware of being (or not) treated in a certain way (due to the category) or of "the acceptability of expressing certain things and no others" (Khalidi 2010, 349). Against Hacking's view that the looping effects is unique to human kinds, Khalidi argues that some non-humans creatures, like some animals, also exhibit this second sense of awareness. As an example Khalidi claims that dogs may well be aware "of the attempt to domesticate them and might comply (e.g. in exchange for rewards) or not" (Khalidi 2010, 349).

In a third possible sense of awareness, it is not the individuals classified but the people around them who are central to the looping. Khalidi writes, "while those who are classified may not have to be aware of the kind in question, nor of the kind-concept with its associated beliefs, nor indeed of what is being done to them, still there must be others in society who are aware of the classification in order to generate the feedback loop in the first place" (Khalidi 2010, 350). This third sense is met by the two examples of "refugee woman" and "multiple personality disorder", since it is others who by treating them in certain ways make it possible for the individuals classified to generate the changes required for the feedback loop. Against Hacking, Khalidi contends that this sense of awareness is also exhibited in non-human kinds. As an example of this, Khalidi considers the case of selective breeding:

> for selective breeding to occur, someone must have been aware of the contrast between tame and wild animals and acted accordingly. The same process occurs when domestication takes place in the present day. Scientists choose specimens of plants and animals and practice artificial selection on them, leading to the creation of new varieties with new properties that then lead them to modify their classifications. (Khalidi 2010, 351)

To put it briefly, Khalidi's argument against Hacking goes as follows. Since Hacking's examples of the looping effect do not exhibit awareness of the kind-concept under which an individual is categorized, the notion of awareness that operates in the looping effect must be weaker. A weaker characterization of awareness, however, could not serve as a criterion to differentiate between human kinds and other sorts of kinds (Khalidi 2010, 350). Under such criteria, the case of selective breeding, for example, shows that the looping effect could also be present in non-human kinds. Thus, Khalidi concludes, Hacking is incorrect in characterizing human kinds as the only type of "interactive kinds" (i.e., kinds in which the looping effect presents).

Cooper and Khalidi offer critiques that share a common theme. Both reject the view that awareness plays a central role in the looping effect. In their view, Hacking's demand that the people classified by the sciences are aware of the kind-concept under which they are being classified is stronger than what his characterization and illustration of the notion shows.

The strength of Cooper's and Khalidi's arguments against Hacking's characterization of the looping effect as defining "human kinds" depends on whether they correctly understand the role played by the notions of "acting under a description" and awareness in the account of "human kinds". On the basis of my reading of Hacking's characterization of the looping effect, I argue that Cooper's and Khalidi's arguments are irrelevant to Hacking's project, if not incorrect. The adequacy of Hacking's characterization of the looping effect does not depend on his appeal to Anscombe's notion of intentional action. Cooper may be right that Anscombe's notion does not support Hacking's view that people act "under a description" provided by the category that classifies them when the looping effect occurs. However, Hacking's appeal to Anscombe's notion may be related to another aspect of the notion not sufficiently considered by Cooper, and it may in any case not be necessary for the characterization of the looping effect. Against Khalidi I argue that Hacking's introduction of the looping effect in his characterization of "interactive kinds" is not trivial even if it is specifically introduced to refer to human beings. It is not in "intentionality" or "awareness" that the

philosophically relevant points of the looping effects lie, but in what is entailed by "interactive". Both arguments fail in placing too much weight on the notion of awareness as applicable to individuals rather than kinds, and ignoring the suggested complexities involved in the interaction between categories and people.

In Chapter 2, I've offered a discussion on Hacking's appeal to Anscombe's notion of intentional action in his description of the looping effect as entailing "action under [a] description." In section 2,2,1. I offer a brief review of Anscombe's views on intentional action, noting that her characterization of "intentional actions" as "action under a description" is only one of at least three senses of her account of "intention". The other two are "intention to act" and "intention in acting". This third sense may be the one that Cooper brings up in her argument against Hacking, since according to it, it is sufficient that a third party may be able to attribute an intention to the actions of an agent for intentional action to take place.

A brief reminder of Anscombe's account may be useful. In her discussion of intentional action, Anscombe held that “to call an action intentional is to say it is intentional under some description that we give (or could give) of it” (Anscombe 1957, §19). If an action is to be considered intentional, one must be able to offer reasons in response to "why" questions. For this to occur the agent performing the action has knowledge of both his doing the action and some causal knowledge that goes beyond the action performed such that, in case he is asked, he could offer a reason as to why he performed the action.

Anscombe is clear in her account of intentional action regarding the need of some non-observational causal knowledge for intentional action to occur. Otherwise, she notes, many involuntary events such as bowel movements or ordinary breathing would have to be considered as intentional, while they are evidently not. Physical events do not meet the criteria of intentional action because no non-observational causal knowledge could be offered as to why the action is performed, for instance, by the guts or the lungs. Having theoretical knowledge of an event, on the flip side, is also not sufficient to meet the criteria for intentional action. One may possess all the current scientific knowledge that explains bowel movements

and ordinary breathing, but having such knowledge would not be sufficient to consider those movements "intentional". Providing an explanation of an event through either merely physical evidence or merely theoretical knowledge does not suffice to establish intentionality. Such a view would allow for nearly any event of which there is a scientific theory to be considered intentional.

In Anscombe's account, when an action is intentional the agent performing the action has some knowledge that a given action is performed (i.e., knowledge of the physical events) as well as some non-observational causal knowledge of the action performed (i.e., causal - theoretical- knowledge of the action performed). In addition to this, if the agent were to be asked why he performed the action, he would be able to offer reasons. . For example, when cooking, the cook is (a) aware that they are performing the act of cooking, (b) are aware of the way the flavors combine when introduced in a certain order and prepared at a certain temperature, and could describe the ingredients put into the dish to a third party (luckily for those with allergies to peanuts or shellfish), and (c) explain why certain ingredients were used over others (so if a person wanted to know "why did you put salt in the pie?" you could respond "it is a meat pie!"). With these three characteristics, we can establish that an action is "intentional". Anscombe is trying to avoid positing intentionality as a special mental state. Her concern is to identify conditions under which one can be said to be morally liable for what one did, and a paradigm case of moral liability is acting intentionally.

Although Cooper may be right that one of the senses of Anscombe's account of intention includes the actions of non verbal agents, that sense does not seem to be the one to which Hacking appeals in his characterization of the looping effect. It is rather Anscombe's notion of intentional action in terms of "reason giving" that seems to be relevant to the notion of awareness involved. Hacking's discussion of MPD illustrates the sense that acting "under a description," as it relates to Anscombe's notion of intentional action as "reason giving", applies to looping effects. Furthermore, the case of MPD also suggests a way to respond to Khalidi's criticisms.

In my revision of Hacking's discussion of MPD in Chapter 2, I noted that the introduction of a theoretical language about MPD provided experts and lay people alike with a theoretical framework for the organization of the experiences and behaviors of those classified as multiples. This theoretical language also served the subjects labeled as multiples to put in perspective and describe their experiences. “Switching,” “alter,” “personality fragment,” “coming out” were among the terms used by experts and multiples. With the theoretical framework and language of MPD experts and multiples were able to make sense of experiences lived, starting by recognizing their very occurrence. The role played by the theoretical framework and language of MPD may be seen in relation to Anscombe's two aspects of intentional action of (1) having some knowledge that an action is being performed and (2) some non-observational causal knowledge of sorts. The theoretical framework and language made it possible for experts and agents to acknowledge, understand and offer a rationale for their experiences in the ways specified by (under the description of) a causal theoretical framework and the language associated to it. They opened a "new world of opportunities" for action. It is in the opening of such conceptual space that Hacking's appeal to Anscombe has relevance in his characterization of the looping effect:

> Anscombe’s theses about action seem to have an unexpected corollary. When new descriptions become available, when they come into circulation, or even when they become the sorts of things that it is all right to say, to think, then there are new things to choose to do. When new intentions become open to me, because new descriptions, new concepts, become available to me, I live in a new world of opportunities. (Hacking 1995a, 236).

A central concern in Anscombe's notion of intentional action was to be able to tell apart intentional and non-intentional actions as a way to determine in which cases we should allocate moral responsibility to an agent. Hacking is less concerned with this aspect of Anscombe's notion. Instead, his emphasis is on the logic of concepts and the possibilities of action that they open up. Intentionality is only significant insofar as we gain new possible

actions to choose from when conceptual frameworks are introduced. For instance, with the introduction of MPD, a "personality fragment" or "alter" can intentionally "come out", something which could not be described in those terms before the introduction of the framework or now that the category of MPD has fallen out of use.[83]

The discussion just offered on MPD also serves to offer a response to Khalidi's criticisms. First, it was not only the "experts" (a third party) who became aware of the jargon regarding the psychological condition of "Multiple Personality Disorder," but the patients themselves. Terms like "Alter" and "Personality fragment" became a part of the vocabulary that people with MPD used to understand and respond to their own experiences. The emergence of self-help groups founded by MPD patients show how individuals were aware of their diagnoses and adopted certain behaviors and self-conceptions in response. The terminology employed by experts was appropriated by those under the category to understand, interpret and respond to the behaviors they expressed, thereby ensuring that the category itself had a causal impact on the people being categorized. As varying positions on these questions informed the therapeutic methods pursued by experts, it came to influence the conditions of treatment faced by the patients. Moreover, since the different views were adopted by groups of people diagnosed with the condition, they also impacted the self-conception of the patients with multiple personality as well as how they responded to the therapies applied in their treatment. This shows that looping effects were present in the

[83] Hacking addresses this point in the following passage: "Anscombe was interested in the intentions of whole people, responsible moral agents. Now under one account of what is happening in multiplicity, the switch is not intentional but involuntary. This may be the account that will be favored if the diagnosis and the name dissociative identity disorder succeeds. We have in effect “less than one person”; we have no well organized person to form intentions. Contrast an account that was widespread during the 1980s and is still current among the rank and file of the multiple movements. When Esther switches to Stan, Stan comes out, takes over, dominates Esther and other alters of Daphne, the host personality. Stan is an agent; Stan is the personality who is responsible for the switch. The switch was not one of Esther’s or Daphne’s intentional actions, but it was one of Stan’s. Stan has decided to come out. Until the new language and conceptions of multiple personality came into use, this was not an option for a personality fragment, not as something like an intentional action. But it was described in the manner of an intentional action, Stan’s action, at least in the 1980s. As dissociative identity disorder becomes the official diagnosis, and personalities become less distinct in theory and practice, these opportunities for intentional action may fade away" (Hacking 1995a, 237).

population of people categorized as having "multiple personalities." Moreover, the changing conceptions of experts led to changing approaches to therapy, leading to similar changes among those categorized as such.

Were Khalidi to be correct in his categorization of multiple personalities, their condition could be wholly explainable according to a theoretical framework (e.g. biological or behavioral), without any need to refer to the experiences and actions of people with MPD. On the contrary, the shifting category of the experts led to similarly shifting self-conceptions by "multiples". By failing to address Hacking's research into the genealogy of this category and its historical development, Khalidi's criticism does not refute Hacking's understanding of looping effects as a characteristic of this group. While it is true that some individuals labeled with MPD might not be clearly impacted by the categorization, the theoretical impact on the treatment of the population as a whole contributed to shaping the category and the experiences of multiples, either through their treatment by others or through the internalization of the concepts upheld by the experts. In either case the knowledge and language produced on MPD impacted multiples through either the treatment they received by experts or a shift in self-conception. Although Khalidi's observation that some non-human kinds change in response of the impact of their being classified (e.g., marijuana) and some objects may even be said to interact with their classifications (such as in the domestication of animals), the change and the interactions in the classification does not seem fit for the epistemic (and ontological) role played by human agents. Had Khalidi been right that non-human objects showed the same changes as human agents, his critique would have had more legs

Is Khalidi correct in his assessment that Hacking's notion of "interactive kinds" trivializes or obscures the notion of interactive kinds, as it ultimately reduces to the idea that objects of classification have some awareness of how they are being classified? Perhaps, but only if one ignores the ontological and epistemic significance of Hacking's characterization of human kinds as interactive. It is not awareness per se that is philosophically significant for

Hacking's project, but interaction. Although Khalidi may be correct in his evaluation that the introduction of the notion of interactive kinds as an intended classification of kinds of kind (i.e., kinds of people) may have been trivial or confused, the kind it intended to capture and the features it highlighted still stand. If my reading of Hacking's MUP project is adequate, then the presence of looping effects, and the analytic framework for the analysis of MUP represents a heuristic to account for the interactions involved in the constitution of kinds of people (i.e., the notion of kinds of people is all that Hacking needed).

Nevertheless, Khalidi places a stronger weight to "awareness" in the characterization of the notion than it ever had (i.e., even in the characterization of "interactive kinds"). What distinguish human kinds from other types of kinds is not primarily that they are aware, but that they interact in ways peculiar to them with their classifications. Not one single human being or all the individuals classified as being of given kind need be aware, but as a type they might be (i.e., some individuals may become aware of their being classified; that's a possibility open to them, which would be closed in case they were not human beings). The merit of the notion does not lie in acknowledging awareness as a defining feature, but in pointing out at the epistemic and ontological dimensions that open up for philosophical analysis due to such a feature. Such philosophically relevant interactions are at the center of Hacking's subsequent development of his framework for the conceptual analysis of kinds of people.

5. 2. Some human kinds are stable

Jonathan Tsou presents a critique of Hacking's characterization of kinds of people as "moving targets", contending that while some human kinds may be unstable objects, there is also a subset of stable psychiatric objects, identified through law-like biological regularities that are uniform across cultures and unaffected by looping effects. Tsou discusses the cases of schizophrenia and depression to illustrate the point. Against Hacking, Tsou argues that in the case of some Psychiatric categories, the presence of looping effects do not destabilize

their objects of classification, and thus Hacking is at fault for a hasty generalization when he characterizes all human kinds as unstable objects or "moving targets".

Against Tsou, I argue that although he may be correct that a component of the Psychiatric categories he discusses can be understood as fairly stable objects, such objects are not on their own sufficient to account for the ontology of Psychiatric categories, if these are to be understood as kinds of people. First, Psychiatric categories, if taken as kinds of people, are better understood within the motley ontological view of relevant kinds that has been articulated in Chapter 1. Second, considering Hacking's comprehensive philosophical proposal, one may expect to find answers to questions about the stability of scientific ontology within the framework of scientific styles of reasoning, which is not taken into account in Tsou's critique. Third, it is unclear whether Tsou's understanding of the implications of the looping effect is adequate, as he seems to prioritize the reinterpretation of the biological as a necessary component for ontological change. This last point, nonetheless, brings up some interesting questions about the scope of the looping effect, its relation to the styles of scientific reasoning, and its implication for scientific change in Psychiatry (and the human sciences). The following passage shows Tsou 's contention against Hacking's ontological view:

> [Hacking's] claim is that the kinds of people (e.g., autistic children or schizophrenics) classified by interactive kinds ('autism', 'schizophrenia') will change in lieu of looping effects such that there is no stable object of knowledge to study. The idea is that because of the constant dynamics between social science classifications and people being classified, the kinds of people being classified are constantly changing in response to how they are classified, and in this precise sense are 'on the move'. Below, I argue that Hacking's claim is a misleading generalization, which requires qualification. I argue that interactive and indifferent kinds—understood as objects of classification—represent a class of objects that are stable. (Tsou 2007, 338)

Tsou's argument follows from the assumption that there are certain subtypes of psychiatric disorders that are causally characterized by the presence of a biological pathology. In such cases, the stereotypical abnormal behaviors associated to a given condition are causally understood as the effects of the biological pathology. For example, Tsou notes, in the case of

schizophrenia the "excessive dopamine activity in the mesolimbic pathway causes hallucinations and delusions" (Tsou 2007, 339), and the feelings of sadness stereotypical of depression "are caused by an underactivity of monoamine neurotransmitters, especially serotonin and norepinephrine" (Tsou 2007, 337). In both cases, Tsou observes, pharmacological research and interventions support the dopamine hypothesis of schizophrenia and the monoamine hypothesis of depression. Tsou takes these two putative mechanisms for schizophrenia and depression as concrete and plausible examples of what Hacking would accept as a putative "pathology P", in his characterization of the distinction of indifferent kinds as opposed to interactive kinds.

The fact that such biological regularities are common in Psychiatry, Tsou suggests, goes against Hacking's characterization of all kinds of people as "moving targets", on the basis that their objects of classification are unstable due to looping effects. If Hacking's characterization were correct, Tsou suggests, he would need to show that the classification is affected due to the effects on the underlying biological pathologies causing the stereotypical manifestations of a condition, and not only the manifestations of such biological pathologies in people's behaviors and experiences.

Tsou's critique of Hacking's ontological view is based on a distinction between a "weak implication" and a "stronger implication" of the looping effect. In the weaker sense an "individual's experience and behaviors are altered in response to looping effects", and in the stronger sense, an "individual's experience and behavior are altered in response to looping effects to the extent that the defining criteria for that classification change" (Tsou 2007, 339). Tsou grants that Hacking's characterization of the weaker implications of the looping effect might be correct, but rejects the stronger implication. Elaborating on the case of schizophrenia, Tsou points out that although the classification of an individual (or a subset of them) may affect his experiences and behaviors (weaker sense of the looping effect), these changes may have no consequence for the revision of the classification (stronger implication of the looping effect). This is so because the underlying causal pathology is unaffected by the

weaker implications of the looping. It may be worth emphasizing at this point that Tsou's central point is that "the law-like biological regularity associated with a particular kind of person can be understood as a stable object of classification that does not change as a result of looping effects" (Tsou 2007, 339).

There is one straightforward response to Tsou's critique on this point. Following the logic of classification and causal knowledge presupposed in Hacking's view, it is inadequate to identify the object of classification of kinds of people with the "law-like biological regularity" associated to a particular kind of person. The biological components characteristic of a kind of people are neither the unique nor the primary defining elements of such a category. That's one of the core takeaways from Hacking's appeal to Goodman's relevant kinds in his view of kinds of people. The objects of kinds of people, understood as relevant kinds, are conceived of as motely entities constituted by a multiplicity of domains, each contributing to the characterization of the class, none of which are hierarchically prior to any other. Tsou's argument takes for granted not only the stability of the biological characteristic of categories of people, but also the priority of such stability as a defining aspect of the category and its causal import. To put it bluntly, because the biological component is stable, Tsou's argument seems to suggest, in spite of other components being subject to change, the category is stable.

In Tsou's argument, the stable biological components seemingly confer stability to the category as a whole. But this is against the logic of kinds of people as relevant kinds presented in chapter 1, 2 and the interlude. The biological stability that may partake in a category of people does not exhaustively constitute or define the ontology of the class. A change in the conception of the biological domain involved in the constitution of a kind of person may or not be relevant for the looping to take place. The example of homosexuality illustrates this, since it is not a change in the putative biological mechanism of homosexuality that brought about the reclassification of the category, but to a great extent it was due to the role played by organized people contesting the adequacy of the pathologizing of the class.

A second aspect in Tsou's argument concerns the sense in which the causal knowledge is transformed as a result of the looping effect. Tsou's argument assumes that the causally relevant element of some categories of people, such as depression and schizophrenia, is the law-like biological regularity in which he identifies the stabilizing element of kind of people. In his account it is the putative brain mechanism, dopamine or monoamines deregulation, which causes the stereotypical behaviors associated to conditions such as hallucinations and sad mood. In the reading offered in chapter 1 and 2 I noted that the sense in which kinds of people provide "causal knowledge" is broader and unorthodox, as the causal import of kinds of people is not placed in a specific domain of those which intersect constituting the category, but rather in the orchestration of diverse pieces of knowledge and the way in which such pieces contribute to the understanding of past, present, and possible future experiences of a person, as being of the kind. The example of multiple personality disorder serves Hacking to illustrate the point.

A third response to Tsou's arguments concerns the notion of ontological stability (or instability) that might be at play in the looping effect. Considering Hacking's overall philosophical view of the sciences, one may relate the stability of scientific ontology to the styles project in which Hacking elaborates on the stabilization of phenomena and scientific ontology through distinct techniques of stabilization specific to each style. It should not come as a surprise that some of the components in a category may exhibit a greater level of stability than others, depending on what techniques of stabilization are at play in a particular domain of phenomena. As the category is constituted by distinct intersecting scientific domains, the stability of the category - ontological or otherwise - is not determined by any of its constitutive domains alone. Under Hacking's picture of science, the stability of a scientific domain is not a given but an achievement that requires careful analysis. Such an analysis is in part what is at stake in the philosophical analysis of the looping effects of kinds of people. How does the stabilization of a component in a given category contribute to the stabilization

of the category as a whole, and to what extent do the unstable components continue to influence the transformation of the category?

The category as a whole would not stop transforming because one of the epistemic or ontological components of a kind of person had become stable. For instance, in the case of schizophrenia, the hallucinatory voices experienced by schizophrenic subjects may be conceived of as a by-product of the dopamine deregulation by the biological sciences studying such biological mechanism. Such a view, however, does not rule out the relevance of other domains of research, such as anthropological research on schizophrenia which may consider cultural differences in the experience of hearing voices to understand how these differences may impact the expression, and progression of the condition.[84] Such a view has also not prevented the creation of social organizations such as the hearing voices movement, which conceives of the experience of hearing voices as meaningful experiences and not merely a by-product of a biological dysfunction.[85]

An account of the stability of the biological component in a given kind of person is relevant in the philosophical account of the category, but such stability does not provide an exhaustive account of the ontology of the class. A kind of person is constituted in as much by a characteristic brain mechanism, as it is by a set of human beings - a population- and their characteristic set of behaviors, experiences and interactions. To understand how a category of person changes, and how its object is stabilized or destabilized, one would have to pay

[84] For instance, the collective work of the anthropologist T.M Luhrmann, and Psychiatrists R. Padmavati, H. Tharoor and A. Osei on the cultural differences on the expression of the phenomenological experience of hearing voices in qualifying subjects for a diagnosis of schizophrenia in the USA, Ghana and India. The study shows that "Participants in the U.S.A. were more likely to use diagnostic labels and to report violent commands than those in India and Ghana, who were more likely than the Americans to report rich relationships with their voices and less likely to describe the voices as the sign of a violated mind." Luhrmann et.al suggests that their findings may be clinically significant insofar as the content and affective tone of hallucinatory voices have been shown to affect the functioning of schizophrenic subjects. They suggest that their study may support the view hold by the Hearing Voices Network that "it is possible to improve a person's relationship with their voices by teaching them to name their voices, to respect their voices and to interact with them, and that doing so reduces the voice's caustic quality" (Luhrmann et. al. 2014, 4).

[85] Such as the International Hearing Voices Network (URL: http://www.intervoiceonline.org/).

close attention to all the components involved in its constitution without privileging one domain over the others.

A final aspect to consider about Tsou's criticism concerns the temporality of the looping effect. Tsou's discussion suggests that the looping effect occurs in cases falling under the weak implication of the looping effect, but do not occur in cases falling under the stronger implication. Tsou grants that scientific classifications influence people's behaviors and experiences but he rejects that the changes in people's experience and behavior that result from such influence prompt the modification of the classification. This suggests that the looping effect occurs rather frequently in its weak sense, but rarely or never in its stronger sense.

That distinction exposes a misguided understanding of the looping effect. The cases falling under Tsou's weak implication of the looping effect are not cases of looping. They are the first step in the looping, but do not count on their own as such. Only the cases that prompt the modification of the classification in an epistemically and ontologically relevant way are cases of looping. I've previously argued that a change in the conception of the law-like regularity that may figure in the characterization of a classification, as Tsou suggests, is not necessary for the looping to take place (e.g., the case of homosexuality). But it is also incorrect to think that all cases in which a classification influences people's behaviors and experiences are cases of looping.

Although I've argued that Tsou's distinction between weak and strong implications of the looping effect is misguided, there is something about the distinction that highlights a puzzling implication of Hacking's notion of looping effect: the extent to which Hacking's view that kinds of people are moving targets involves ontological changes. Hacking's view that kinds of people are moving targets is closely related to his notion of the looping effect. The matrix provided by the vectors of analysis of MUP integrates both stabilizing and destabilizing components, but beyond that point there are no specifics on what it takes for the revision of classification as prompted by the looping effect to bring about an ontological transformation. If

kinds of people are moving targets because they present looping effects, then since the looping effect is not as frequent, kinds of people as scientific objects are not so volatile. Not all the effects of classification on the people they classified are sufficiently significant to produce the revision of a classification that could bring about a world change. In other words, although scientific classification transforms kinds of people, which in a sense amounts to an ontological change, not all the changes produced by scientific classification on people produce new kinds of people. This point does not undermine the thesis that "kinds of people" are a moving target, but it calls for further clarification. In the final section of this chapter I offer a discussion on this point.

5.3. Hacking's semantic strategy cannot reconcile the competing explanatory claims of the medical and the biopsychosocial models

Dominic Murphy presents an additional criticism targeting Hacking's proposed semantic strategy to overcome the dichotomy between the "natural" and the "social." He emphasizes the explanatory, rather than the metaphysical, in the divide between the medical model and the biopsychosocial model in Psychiatry. Sympathizing with Hacking's conciliatory view of the natural-social divide, Murphy contends that the specification of distinct semantic domains for the natural and for the social in the determination of Psychiatric categories is not sufficient for their conciliation. In his view, the challenge consists in mediating between two competing explanatory approaches, each with their own victories; one on a natural (biological) basis and the other on a social basis (Murphy 2001, 140). This conciliation, he argues, could be better achieved at the methodological level.

Murphy's argument could be divided in three parts. First, he argues that Hacking's adoption of Putnam-Kripke semantics compromises the internal consistency of his account, since it entails two conflicting causal pictures of the behavioral manifestations of mental illness. Second, Murphy argues that Hacking's assumption of the essentialist picture of the Putnam-Kripke semantics renders his account empirically inconsistent since such an

essentialist picture is at odds with the scientific understanding of mental illness. Third, even if Hacking's semantic account were logically and empirically adequate, allocating distinct semantic domains to the natural and to the social would still leave each realm apart without bringing them any closer.

Murphy's criticisms follow from his understanding of Hacking's appeal to the Putnam-Kripke semantics as a strategy to set apart the biological or "physical basis" of mental illness (i.e., its referent) from its behavioral manifestations (i.e., its stereotype) (Murphy 2001, 140). In his reading, the referent of "autism" would consist of a putative "underlying neuropathology", while its stereotype would consist of the "ways of being" of "the actual set of childhood autistics". The underlying neuropathology of autism is seen as an "indifferent kind" and the set of childhood autistics as an "interactive kind". By distinguishing the underlying pathology and the behavioral manifestations in this way, Murphy contends that Hacking assumes that the former provides the "genuine causal" story that produces the behavioral manifestations of autism.

In his critique, Murphy first targets the internal consistency of Hacking's account due to his appeal to the Putnam-Kripke semantics. Murphy argues that Hacking's semantic strategy for bridging the natural and the social entails two conflicting causal views of mental illness. On the one hand, Hacking appeals to the Putnam-Kripke semantics, which comprises a reductionist and essentialist view of mental illness, in which the behavioral manifestations of mental illness could be caused (i.e., explained) by a putative biological pathology. On the other hand, the notions of a social niche and looping effect that Hacking introduces also provide an account of the social causation of mental illness. According to this second view, the behavioral manifestation of mental illness may be produced by the accumulation of social vectors into a social niche, in the absence of a biological pathology. The study of the behavioral manifestations of mental illness may prompt the introduction of a mental illness category, and in turn such introduction may impact the behaviors studied, producing a looping effect. Under this view, the contributions of the medical approach are seen as merely

adding to the vectors in the social niche of a mental illness (Murphy 2001, 148). It is the sum of the forces in the vector that causally account for the production of mental illness, rather than the putative biological pathology.

These two causal stories suggested in Hacking's view, Murphy argues, are in conflict with each other: either the biological pathology causes the behavioral manifestations of mental illness, or the social forces in the ecological niche of mental illness do. Along these lines, Murphy writes,

> it is unclear how far Hacking is entitled to the causal story that underpins the Kripke-Putnam picture given his other commitments. Kripke and Putnam assert that the connection between essence and surface manifestation (the kind of perceptually salient properties that get incorporated into the stereotype) is a causal one. Water's surface properties are the effect of its underlying molecular structure. For Hacking, however, the manifestation of autism results from social forces, not the underlying neuropathology. (Murphy 2001, 153)

Furthermore, in Murphy's view the adoption of the Putnam-Kripke semantics not only compromises the internal consistency of Hacking's account of mental illness, but also its consistency with current scientific knowledge. Against the essentialist picture Murphy contends that the "neurological" picture has established that the form that brain pathology may take varies according to the social forces that impact it, even if variation is not appreciated at a large-scale. Murphy draws from this view that "the brain, being the organ of cognition, changes in response to changes in the social and cultural environment" (Murphy 2001, 154). If brain pathologies would serve as the "essences" of a mental illness they would have to resist change, otherwise what would it mean, say, for H_20 to be the essence of water if it becomes a different substance when freezing? Brain pathologies would make unstable essences and, as such, not essences at all.

Supplementing his argument Murphy also contends that, in any case, Hacking's approach fails because allocating distinct semantic domains to the natural and the social still leaves apart the two conflicting explanatory approaches behind the medical and biospychosocial models. Murphy seems to suggest that what follows from Hacking's appeal

to Putnam-Kripke semantics is a doubled causal view of mental illness in which brain pathologies and social forces are held to cause the behavioral manifestations of mental illness. The issue with this, Murphy argues, is that the two causal accounts are in competition with each other and Hacking's account does not account for the way in which the two may interact to produce such manifestations.

Murphy considers that the challenge posed by the split between the medical model and biopsychosocial model is that it presupposes that either brain pathology explains the manifestation of mental illness or social forces do. He notes that whereas the medical model better explains some mental illnesses on the basis of brain pathologies, such as autism, the biopsychosocial model explains better other conditions, such as eating disorders. Murphy associates the medical model with scientific realism, and the biopsychosocial model with social constructionism. According to the medical model, brain pathology causes behaviors. According to the biopsychosocial model, social forces - such as Western standards of beauty in the case of eating disorders, cause behaviors and brains to change. Either the causal picture of the medical model is adequate or the causal picture of the biopsychosocial model is. Assigning semantic domains to each approach, Murphy argues, does not solve the causal challenge underlying the divide between the two approaches, let alone the fact that it appears to be unclear if not inconsistent.

In Murphy's view the mediation between the natural and the social is already suggested by a methodological strategy commonly used by the cognitive sciences, in which behavior is thought of as being caused by "the representation of social properties by the brain" (Murphy 2001, 155). This strategy, Murphy argues, provides some understanding on "how the social dynamics [that Hacking] discusses can be mediated by neuropsychological structures" (Murphy 2001, 141). Murphy argues that this position does not require a major commitment to the mental, as it only requires positing that "people can think about the social world and that these thoughts are realized in biological material that mediates between culture and behavior" (Murphy 2001, 156). Murphy considers that the strategy could

potentially explain how mental illness could arise in the absence of brain pathology, as well as individual variation. For instance, it may help to understand how some social forces play a role in the formation of "distinctive patterns in [the] development" of poor French men, explaining "how not all poor French men became fugueurs" (Murphy 2001, 156).

Murphy illustrates his view with a discussion of dysthymia. Dysthymia is an affective disorder characterized by depressed mood, for most of the day and for most days, over a period of 2 years, without presenting any episodes of major depression or mania. Studies have shown that dysthymics score low in their "ability to achieve social goals and carry out simple social tasks", show a tendency "to blame others for their dissatisfactions rather than considering their own behavior" (Murphy 2001,158), engage less in social interactions in comparison to control subjects and, remarkably, hold the belief that "they have helped others significantly more than they were helped by others" (Murphy 2001, 158). Murphy considers two hypotheses that possibly explain dysthymia. According to one, "dysthymics suffer from a psychological impairment, intrinsic to their cognitive architecture, that renders them incapable of learning the norms of reciprocation" (Murphy 2001, 158). According to the second hypothesis, "dysthymics are capable of acquiring the relevant information but have failed to acquire it" (Murphy 2001, 159). If the latter hypothesis is correct then some form of cognitive therapy may correct dysthymics' "deep-seated cognitive biases," replacing them with more socially acceptable norms. If the first hypothesis is correct, no cognitive intervention could be of help for dysthymics. In either case, Murphy argues, looking into dysthymics' thoughts would contribute to better explain their conditions. This makes plain, Murphy suggests, that the medical and the biopsychosocial models could be brought closer together in an explanation of dysthymia if the cognitive mediates between them. Murphy argues that "abnormal content" rather than "abnormal mechanism" may help to understand how mental illness's behavioral manifestations may be present when it is not clear whether there is underlying brain pathology.

Murphy's criticisms are targeted at what he takes to be the metaphysical picture endorsed by Hacking in his use of the Putnam-Kripke's semantics. Hacking's appeal to Putnam-Kripke's semantics, however, does not extend to the metaphysical claims that are associated with their view. In particular, it does not entail either the reductionism or the essentialism of mental illness that Murphy attributes to him. In my discussion of Hacking's view on the semantic resolution and causal knowledge in Chapter 2, I noted what I take to be the relevant aspects that Hacking takes from Putnam's semantics; namely, his view of meaning as a vector, which includes the view of natural kind-terms as indexicals and the hypothesis of the division of linguistic labor. Although the indexicality of natural kinds terms has been generally associated to the essentialist view of Kripke, Hacking disentangles Putnam's account from Kripke's. Hacking is very clear on this point in his paper "Putnam's Theory of Natural Kinds and their Names is Not the Same as Kripke's" (Hacking 2007d), in which he clearly differentiates between Kripke's essentialism and Putnam's version, which he sees as compatible with his commitment to nominalism. In this paper, Hacking states: "Interest in essence marks out a central difference between Putnam and Kripke. Putnam never allowed himself much more than "so to speak" essence, and increasingly withdrew from, e.g., the idea that water is necessarily H_2O. In the end he wholly rejected the notion of "metaphysically" necessary a posteriori truths about natural kinds" (Hacking 2007d, 5-6).

In Chapter 2 I also noted Hacking's commitment to a fallibilist view of knowledge, which does not allow for the postulation of metaphysical essences nor of necessary and sufficient conditions. It seems to me that the notion of the indexicality of natural kind terms is welcome by Hacking only in a pragmatic way. And yet with such an idea he is able to rescue the minimal realist intuition that there is something in the world, the referent of a term, which is picked out by concepts. In subsequent developments of his account of kinds of people, Hacking has specified further his own version of the "meaning vector" of kinds of people. This view was discussed in Chapter 1.

Hacking's semantic account could easily avoid the first two of Murphy's criticisms. Murphy's charges of being internally and empirically inconsistent are due to the combination of the essentialist and the social constructivist causal views as competing modes of explanation of the behavioral manifestations of mental illnesses, but Hacking's view is not committed to the essentialist view of brain pathologies.[86] Hacking's semantic reconciliation of the natural and the social is better understood as a part of a philosophical account of classification rather than as a theory of causation. Classifications of mental illnesses are only one of the types of classification for which his account may be suited, but only insofar as these are conceived of as types of persons or "human kinds". Hacking's semantic account, insofar as the notion of a meaning vector that he adapts from Putnam in his account of human kinds, does not specify the way in which the natural and the social causally interact in the production of the behavioral manifestations of mental illness. In this regard, the force of Murphy's third criticism would depend on how one fills that out.

This last point suggests that Hacking's notion of a vector could be better understood as a heuristic for the analysis of specific categories, including mental illnesses. In this account it is acknowledged that the natural and the social play may play an indispensable role in the determination of a category, but the relations between the two components is to be determined case by case. Murphy's account of the mediation between the natural and the social in terms of cognitive content may, in Hacking's account, be one possible way in which the natural and the social interact. However, no causal story of the relation between the natural and the social could be generalized for all mental illnesses or human kinds, although some common themes may be similar among them. Hacking's analyses of diverse kinds of people (child abuse, multiple personality, homosexuality, etc.) show that the natural and the

[86] It may be worth emphasizing Hacking's distinction between Putnam's basic realistic commitments and Kripke's essentialism. As previously noted, Hacking is sympathetic to Putnam but not Kripke. One may also here emphasize that Hacking's own account of dynamic nominalism is emphatically non-essentialist.

social components that partake in the constitution of categories varies from case to case, as do their interactions.

One can then grant that Murphy is correct in his understanding of the role played by the notion of an ecological niche as the space in which a series of social vectors participate in the generation of mental illness, but note that Hacking's account is not concerned with causation or explanation but with classification and its ontological implications. Given this distinction, Murphy is wrong in his understanding of a tension between this view and Hacking's semantic strategy. One can understand the reference of a term as an indexical without committing to essentialism. Here again, Hacking's semantic strategy is not committed to Kripke's essentialism, but rather we should understand it in relation to Hacking's defense of pragmatic realism and his commitment to nominalism.

Murphy's emphasis on causation and explanation highlight some interesting points that could be clarified and further elaborated from Hacking's account. While Hacking does not accept a metaphysically loaded notion of causality, Murphy's understanding of the ecological niche as a space in which various social vectors converge in the production of mental illness could be extracted as a causal account. However, this understanding is not explicitly supported in Hacking's work. As I've noted in Chapter 1, Hacking seems to be less concerned with the metaphysics of causality than with its pragmatics. He switches the focus from causes to the broader notion of "causal knowledge". As a reminder, Hacking rejects a definite account of kinds, including natural kinds, in terms of necessary and sufficient conditions. It is not Kripke's essentialist account that one has to associate with Hacking's appeal to Putnam's semantics, but to Lakoff's prototype theory of concepts and Goodman's account of relevant kinds.

In the example of MPD, Hacking argues that the etiology of mental conditions rests on fairly-necessary-conditions rather than on necessary or sufficient conditions (generally purported in accounts of natural laws and natural kinds). On the one hand, childhood sexual trauma plays a crucial role in the understanding of the formation of MPD, but it does not

determine that an individual will develop multiple personality disorder. On the other hand, while most "multiples" were victims of childhood sexual assault, not all of them were. This shows that childhood sexual trauma is neither necessary nor sufficient for MPD (or disassociation), and yet it serves experts to understand MPD's associated behaviors. Childhood sexual abuse, Hacking argues, is better understood as a part of a prototype of MPD. Bringing again Hacking's words on this matter: “[I]f you were giving a best example of a multiple, you would include child abuse as one feature of the example” (Hacking 1995a, 83). (A multiple who has been the subjected to childhood sexual trauma fits the prototype of MPD, the way a raven or a turkey is more likely than an ostrich to be the prototypical bird for a person from California. The prototype of a kind is seen as causal insofar as it serves as a guide to deal with experience, whether for the purpose of identification, explanation or intervention.

A second point highlighted by Murphy’s critique concerns explanation. Murphy correctly notices that Hacking's semantic resolution does not deal with the problem of deciding between two competing explanatory accounts of mental illness. Similarly to causation, Hacking switches from talking about explanation to talking about the validation of knowledge claims and vindication of kinds of people. These two are at the heart of Hacking's overall project, and the most we can extract from Hacking's work is two schematic views: the 5-vector framework for the analysis of MUP and the six schemata used for the validation of knowledge claims in the styles of scientific reasoning. Hacking asks us to envision a distinct way of doing philosophy of science. Rather than trying to decide between competing accounts of causation, explanation, laws of nature, and other metaphysically loaded units of analysis, we are invited to look into how the distinct knowledge claims (and their associated ontologies) are produced and accepted in actual scientific discourse.

When we look into such processes what we find is not one or two views, call them "the medical model" and "the biopsychosocial model", but a myriad of views all contributing to the understanding of a phenomenon (or a type of entity, such as a kind of person). Hacking's

understanding of kinds of people as cross-cutting categories and relevant kinds presented in Chapter 1 offers some insight into how one could go around the challenge of inconsistency. Another insight into the constitutions of kinds of people - understood as scientific categories - and the validation of scientific knowledge about them is provided by the styles of scientific reasoning. From this point of view we might say that the medical model prioritizes the laboratory style, whereas the biopsychosocial model may be more open to other forms of validation. Whether the styles could suffice to account for the ways in which knowledge claims about psychiatric kinds come into being and are validated is a different matter.

The absence of a treatment of explanation and scientific methodology in MUP highlights the extent to which Hacking is pushing us to reconfigure the way we think about the philosophy of the sciences. One may wonder whether there is still room to raise general questions concerning scientific explanation and the methodology of the sciences within Hacking's philosophical picture of the human sciences. In the conclusions of this dissertation I offer some insights into the way in which explanatory and methodological matters may still be relevant for MUP. A careful exploration of these two points, however, fall beyond the scope of this work.

4.4. Looping effects and MUP: are kinds of people moving targets?

By reading Hacking's proposal as merely responding to the social constructivism and scientific realism debate, the critiques reviewed underestimate the extent to which Hacking's account represents a move away from this philosophical conversation. The philosophical significance of Hacking's characterization of kinds of people in terms of the presence of the looping effect does not reside in the contrast it suggests between human kinds as opposed to natural kinds, nor in the putative challenge that the distinction represents for a realistic understanding of mental illness, as the criticisms suggest. *Of more philosophical significance is the role it plays as the backbone of a distinct philosophical approach to the analysis of*

scientific classification in the human sciences and the picture of the human sciences that emerges from it.

The notion of the looping effect highlights the peculiarities of scientific classification as it operates in the human sciences. What distinguishes scientific classification in the human sciences form other scientific enterprises is not just that human beings have awareness nor that they change due to the introduction of scientific classification. The notion of the looping effect stresses the distinct ways in which the classifications of human beings interact with their objects in contrast to other scientific classifications. Specifically, that the very introduction of scientific classifications of human beings motivates the change of their classified objects, generating ontological changes that other scientific classifications do not undergo. Such ontological changes prompt Hacking to suggest that kinds of people are "moving targets". That human beings are self-aware agents undoubtedly matters in the notion of the looping effect, but the presence of awareness is not by itself the main differentiator. The emphasis is rather on the characteristics of the interactions between classification and objects, which are made possible in part due to human awareness. The epistemic and ontological significance of the notion of the looping effect concerns the ways in which scientific classification allows for new types human beings to come into being, and how, once they have been brought into existence, they continue to change, or they cease to exist insofar as we grant reality to scientific objects. It is a notion that signals where the philosophical action is, namely, on the interactions between classifications and the classified (and what goes on in the mediation of such interactions).

An additional point I'd like to address concerns the ontological implications of Hacking's account suggested by Tsou's criticism against the view of human kinds as "moving targets". Tsou's differentiation between a weak and a strong implication of the looping effect highlights the ontological strength of the notion of the looping effect. I do not think that the suggested weak implications of the looping effect are cases of looping at all, but only an aspect of the looping. However, I sympathize with Tsou's observation that the claim that kinds

of people are "moving targets" suggests a stronger sort of epistemic and ontological change than merely the, so to say, everyday effects of classification on people's behaviors and self-understanding. I disagree that this stronger sort of change requires the redefinition of the biological components of a classification. But it is unclear that the changes that matter for producing the strong epistemic and ontological transformations suggested in the notion of the looping effect present as frequently to support the characterization of kinds of people as moving targets.[87]

The idea that kinds of people are moving targets suggests that epistemic and ontological change is continuous and continual in the human sciences, specifically as it concerns (scientific) human ontology. Along these lines we may say that kinds of people are Heraclitean. Through their interaction, classifications and human beings are constantly changing each other. This suggests that change is common. Perhaps the commonality of change refers to the effects produced in people by scientific classification, as Tsou notes in the notion of a weak implication of the looping effect.

But perhaps the idea of constant changes in classification may be understood within a different time frame. After all, in comparison to other sorts of scientific classification, it is rather hard to find scientific classifications in the human sciences that have been agreed on for long periods of time. It would suffice to say that scientific classification in the human sciences is a product of the twentieth century. Hacking's account of the emergence of the statistical style offers at the same time a partial story of their origins of scientific classification

[87] The cases of homosexuality, fugue, MPD and hysteria may be seen as supporting Hacking's characterization of kinds of people as moving targets. They are certainly so when considered over the longer term. Twenty or fifty years, or even a century of endurance as diagnostic categories are relatively short lived for scientific categories. Consider two examples. The case of homosexuality introduced in *Heinrich Kaan's 'Psychopathia Sexualis* in 1884 or its introduction into the first edition of the DSM in 1952, to its removal from the third version of the DSM in 1980. The popularity of the diagnosis of hysteria as an umbrella category for a myriad of afflictions of women endured approximately from the 1840s to the beginning of the 20th century, and continued with infrequent use until about the 1940's (Micale 1993). Some authors, such as Rachel Maines are more candid in their accounts of the condition, acknowledging the life of the category from the fourth century B.C. to its abandonment by the American Psychiatric Association in 1952 (Maines 1999, 2). Nonetheless it is worth noting that the sort of substantive change required for the completion of the looping is not a daily, monthly or even yearly event. In these cases, it took decades for the looping to be realized.

in the human sciences. On a long and slow paced time frame such as the one of the styles, the speed at which classifications change in the human sciences appear fast and continuous. Take as a point of reference the DSM, which was introduced relatively recently, in 1952, and has been subjected to relatively constant revisions. Revisions in classification are not unique to the human sciences but the rate of change and the extent to which those changes have transformed their conceptions of their objects of classification differentiate them from other sorts of scientific classification. To continue with the DSM example, classifications have come and gone, but perhaps most dramatic is the exponential growth of the number of classifications.

Classifications in other sciences also have an origin, but once introduced, major redefinitions are rare. This does not deny that classifications in the natural sciences also change. Knowledge is fallible through and through. But major revisions in classification, like those suggested in Kuhn's scientific revolutions are extraordinary events in the natural sciences. It may also be appropriate to remember that a central thesis in the Styles project is that each style introduces a distinct kind of scientific object, creating the space of possibility for new kinds of things to come into existence. This point is remarkably illustrated by the laboratory style, in which new objects are quite literally created, in the sense of being materially produced. But Boyle's vacuum, once its existence was established, remained in the inventory of reality. In contrast, neither the classifications of people nor their objects of classification (people) have stayed put. Hacking accounts for the rate of and extent of changes in the classifications of human beings in the human sciences by introducing the notion of looping effects.

Classifications of people in the human sciences do not only change as a result of further scientific study, nor is change always gradual. First, the very introduction of the classifications fosters ontological change (a change that in turn may prompt subsequent revisions). This is one sense in which kinds of people are inherently "on the move". But the

looping effect also suggests a stronger type of ontological change, when the transformation of the objects produced by the introduction of scientific classification prompts their revision.

I take this second sense to be the most radical of the theses put forward in Hacking's analyses of MUP: scientific classification changes its objects (people), and such ontological changes are significant enough to prompt the revision of the classification (epistemic change). There are two distinct senses in which scientific classification in the human sciences produces ontological change. Both senses are distinct to the way in which scientific classification interacts with its objects in the non-human sciences. But of particular philosophical interest is the second sense, since it is such substantive revisions that make it possible for new kinds of people to come in and out of existence. It is the second sense that produces breaks in the body of knowledge about what kinds of people are a part of the inventory of reality. It is the second sense which is at play in Hacking's exemplars of MUP. That's the sort of transformation that occurred when multiple personality disorder ceased to exist (and was replaced by dissociative identity disorder) and when homosexuality ceased to be a subclass of mental illness.

What happens when a new kind of people come into being? How does it fall out of existence? Those changes are not everyday changes due to just any destabilizing force. Those changes transform the world associated to a kind of person. That is, I think, the most significant point of MUP analyses and the looping effect. New kinds of people, like MPD or fugue, do not come in or out of existence every day, nor are all the changes that might be produced by the introduction of the scientific classification of people sufficiently significant to prompt the revision of the classification such that it produces an epistemic and ontological break. This suggests that kinds of people are not so quickly "moving" as it appears if one only considers the first sort of ontological change. Both sorts of ontological change distinguish kinds of people (classifications and their objects) from other kinds, but only the second supports a strong interpretation of the characterization of kinds of people as "being on the move".

Tsou is right when he notes that not all ontological changes produce substantive ontological changes but he is, however, incorrect in his view that for a substantive change to occur the law-like biological regularities associated to a kind of people have to change. Yet, in the grand scheme of time, the scientific classifications of people are young and subject to frequent revisions. In spite of founded law-like biological regularities and genetic markers, classifications of mental illness still are prone to change. Time may prove Tsou right concerning the cases of schizophrenia and depression as they endure revisions, but for the time being it is rather too early to draw any strong conclusions. Hacking's MUP suggests a case-by-case analysis through time and in space. Hacking's account of MUP in terms of looping effects offers a heuristic to analyze how kinds of people come into being, how they are sustained within an ecological niche, and how when such an ecological niche is transformed change takes place (including the very transformations that people undergo due to the introduction of classification). The MUP analytic framework covers these sorts of ontological change.

Final Remarks

Hacking's Philosophy of the Human Sciences and Making Up People

In this work I've offered a reading of Hacking's account of MUP, articulating its philosophical background and situating it within the general philosophy of the sciences where it belongs. I have shown how once we look at the larger philosophical picture, it becomes clearer that the notion of looping effect plays a heuristic role by highlighting the epistemic and ontological importance of the interactions between some common elements which partake in the classification of people, including their generation, validation, implementation and revision.

The analysis of classification in the human sciences in Hacking's MUP does not merely pertain to the relationship between concepts and objects. This relation is mediated and enacted by a manifold of elements, including a multilayered set of knowledge claims validated according to distinct styles of scientific reasoning, institutions within which knowledge claims are both generated and implemented, an ecological niche which makes possible the generation and sustenance of a classification and kind of people, the people classified as constituted by their set of behaviors and physical components (e.g., their brains and body systems), and the people for whom the classification is relevant such as the advocates of the classified. From this complex of factors and forces, Hacking extracts his novel and radical thesis that kinds of people are moving targets. That is, the way in which the scientific classifications of people work both the people's classifications and people as their objects of classification prove to be shifting entities.

The difference between the human sciences and non-human sciences is neither explanatory nor methodological, nor does it entail a higher regard for the non-human sciences above the human sciences as more "objective" or "scientific". In Hacking's picture of the sciences, the difference between the human sciences and non-human sciences is established by the interactions held between their respective types of objects of study and their classifications. The sciences that study rocks and the sciences that study human beings

both use the same validating criteria (e.g., hypothetical, experimental or statistical techniques). But the relationships between classifications of rocks and the rocks they classify, in contrast to the relationships between the classifications of people and the people they classify are radically different. The classifications of people are not merely top-down labeling or even top-down creation of phenomena (as in the case of rocks and artificial breeding) but also a bottom-up influencing and revolting (as in subjects' advocacy and activism). The institutions and bureaucracies in which the classifications are implemented and within which the interactions between classifications and people occur are lacking in the case of the non-human sciences. The scientific classifications of people are not only shaped in a top-down manner, but also in a bottom-up manner mediated by a multiplicity of institutional and social interactions. Such multifaceted shaping has both epistemic and ontological import.

The image of the human sciences, and the place they occupy in a general philosophy of the sciences as suggested by the notion of MUP, is both old fashioned and innovative. It is old fashioned insofar as MUP fits within a general philosophy of science whose core is an account of scientific rationality (the styles of scientific reasoning) and conceptual analysis (dynamic nominalism and relevant kinds). Hacking's philosophy of the sciences, however, reconfigures most, if not all, the traditionally central issues in the philosophy of the science, remarkably, scientific rationality and ontology.

Hacking's account of scientific rationality distinguishes from traditional philosophical accounts by breaking up scientific rationality into a parsimonious plurality, namely, the styles of scientific reasoning. All the sciences, natural and human alike, can and do make use of the styles. In that sense, Hacking's philosophy of the sciences is perhaps the most comprehensive model of science developed since Kuhn's *Structure of Scientific Revolutions*. Moreover, it is perhaps the most comprehensive account that has ever been proposed in the philosophy of science, as it covers both the natural and the human sciences. Such philosophy of the sciences, whether human or not, is both historically grounded and socially contingent, and yet substantiated in the real world. Not only scientific knowledge has a history

and place of birth, but the rationalities that operate behind it do too. Furthermore, the very entities that are postulated by the sciences are both historically and socially originated. Neither their historicity nor their being socially constrained makes them less real.

While Hacking's account of the styles of scientific reasoning is revolutionary, his framework for the conceptual analysis of MUP is pioneering. Hacking's framework offers a rich heuristic for approaching and organizing the different aspects that may be involved in the generation of scientific knowledge about classes of people and their ontological implications. It presents an original and radical view on the ontology of the human sciences by highlighting the postulation and generation of "human types" as a consequence of scientific classification and their legitimization through institutional interventions. Such a postulation is largely implicit, and one could even say unconscious, but its acknowledgment is crucial for advancing a philosophical understanding of the human sciences; particularly, on the ontological spaces that are opened and closed in the scientific study of human beings. Ultimately, Hacking's MUP warns us against an understanding of scientific classification of people as the imposition of a privileged theoretical perspective on a group of people as if one of its constitutive parts defined a kind of person as a whole, and highlights the confluence of a multitude of theoretical perspectives, practices, social arrangements, and agents in the shaping and re-shaping of human beings.

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