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À maman.

TABLE OF CONTENTS

SUMMARY

This master's thesis is a study of the intersection of naturalistic epistemology and transcendental phenomenology. The aim of the thesis is to assess whether or not, and to what extent, it is possible to bridge these frameworks. The thesis is divided into two chapters. The first chapter examines this issue of rapprochement from the point of view of transcendental phenomenology. The chapter attempts to define a form of naturalism that is compatible with Husserl's transcendental phenomenological framework. After discussing varieties of naturalism and the projects the naturalize phenomenology, the first chapter examines the philosophical commitments of Husserl's project and draws the partial conclusion that Husserl rejected almost every form of naturalism. The first chapter then tries to show that a minimalist variety of naturalism, what I call weak methodological naturalism, is in fact complementary to Husserl's framework. Drawing on Husserl's proposal of a science of the mind and lived body called somatology, I close the first chapter with the suggestion that a set of sciences, which I call sciences of constitution, might be apt to study the real structures that act as conditions of possibility for the experience of this or that kind of meaningful unity in lived experience. The second chapter addresses the question from the perspective of naturalistic epistemology and explores the issue of psychologism, or the relevance of psychology for epistemology. I first provide a brief history of psychologism in the 19th and 20th centuries. I then turn to the notion of psychologism and examine some of its varieties, in line with my discussion of naturalism in the previous chapter. After reviewing a central change in the contemporary conception of epistemology, which I argue is interested (among other things) in the epistemic capacities of concrete agents, I present an argument for weak psychologism. I conclude the thesis with a *constat d'échec*: the domains studied cannot be bridged for lack of basic agreement on main premises.

KEYWORDS: transcendental phenomenology, naturalistic epistemology, cognitive science, naturalism, psychologism, naturalization.

RÉSUMÉ

Ce mémoire de maitrise est une étude de l'intersection de l'épistémologie naturaliste et de la phénoménologie transcendantale. L'objectif de ce mémoire est de déterminer si et dans quelle mesure il est possible de rapprocher ces cadres théoriques. Le mémoire est divisé en deux chapitres. Le premier chapitre examine ce rapprochement à partir du point de vue de la phénoménologie transcendantale. Ce chapitre tente de définir une forme de naturalisme compatible avec le projet de Husserl. Après avoir discuté des variétés du naturalisme et après avoir passé en revue les projets de naturalisation de la phénoménologie, ce chapitre examine les engagements philosophiques principaux du projet de Husserl et en tire la conclusion partielle que le père de la phénoménologie transcendantale rejetait quasiment toutes les variétés du naturalisme. Le premier chapitre tente ensuite de montrer qu'une variété minimaliste du naturalisme, que j'appelle le naturalisme méthodologique faible, est complémentaire au cadre posé par Husserl. M'inspirant de la proposition que fait Husserl d'une science de l'esprit et du corps vécu, qu'il appelle somatologie, je clos le premier chapitre avec la proposition qu'un ensemble de sciences, que j'appelle sciences de la constitution, seraient aptes à rendre compte des conditions empiriques dans lesquelles certaines unités de sens se constituent dans l'expérience vécue. Le second chapitre examine la question du rapprochement du point de vue inverse, à savoir celui de l'épistémologie naturalisée. Il étudie la question du psychologisme, c'est-à-dire de la pertinence de la psychologie pour l'épistémologie. Je procède d'abord à un bref examen de la situation historique entourant le psychologisme aux 19^{e} et 20^{e} siècles. Je me penche ensuite sur les variétés du psychologisme, reprenant les réflexions sur le naturalisme du chapitre précédent. Après avoir examiné un changement central dans l'épistémologie contemporaine et avoir défendu l'idée que cette épistémologie s'intéresse aux capacités épistémiques d'agents concrets (parmi d'autres objets d'études), je présente un argument pour un psychologisme faible. Je conclus le mémoire avec un constat d'échec : les domaines étudiés ne peuvent pas être rapprochés puisqu'ils partent de prémisses contradictoires.

MOTS-CLÉS : phénoménologie transcendantale, épistémologie naturaliste, science cognitive, naturalisme, psychologisme, naturalisation.

INTRODUCTION

1. General description of the thesis

This master's thesis explores research questions at the intersection of two domains of research: naturalistic epistemology and transcendental phenomenology. "Naturalistic" approaches to epistemology are a kind of research programme in philosophy, the aim of which is to inform traditional epistemology, concerned with questions about the nature of knowledge and the relation of justification between our evidence and our beliefs and knowledge claims, using the methods of the experimental natural sciences. After disappearing (rather, being banished) from the philosophical landscape for most of the 20th century, naturalistic approaches to epistemology were reintroduced by Quine in his famous 1969 "Epistemology naturalized," which programmatically laid out the main desiderata of the approach. Naturalistic approaches to epistemology aim either to outright replace, or to complement, epistemology with the methods of the natural sciences, especially with those of experimental psychology. In the latter case, the view is known as psychologism: the view that the natural science called experimental psychology can either entirely replace or, on less radical readings, supplement epistemology. Faced with the blatant failure of foundational projects aiming to deduce good science from observation, Quine asked the question, the now infamous question: in matters epistemological, "Why not settle for psychology?"

"Transcendental phenomenology" is of an entirely different, almost opposite nature: a philosophical research programme aiming to provide apodictic (intuitively self-evident, indubitable) foundations for all knowledge claims, *a priori* foundations grounded in the invariant, essential properties of immediate lived experience. Such foundations would be an apt epistemological ground for the justification of all knowledge claims and scientific disciplines, providing science with a firm basis from

which to proceed. But the birth of phenomenology was also a declaration of war against naturalism. Husserl, the father of transcendental phenomenology, viewed his research programme from the first as a radical critique of naturalism and naturalistic epistemology. Philosophy, argued Husserl, is for principled reasons irreducible to the natural sciences, and ought to expect no clarifications from them, especially not in epistemological matters. Philosophy, he argued, is both autonomous and methodologically distinct from the experimental, natural sciences: phenomenologists reach their foundations through a change of attitude towards, and a rigorous description of, first-person experience, rather than through experimentation, and are concerned with those factors that make knowledge possible. The project of a transcendental phenomenology thus conflicts with naturalistic epistemology at a fundamental level. The two projects, at a glance, seem incompatible.

This apparent incompatibility has not stopped cross-talk entirely. Naturalism and phenomenology are often mentioned in the same breath, and many studies have been devoted to examining whether there could a rapprochement between them. Since the early 1990s, a body of literature has attempted to build a bridge between phenomenology and the natural sciences, specifically with cognitive science. Some have gone so far as to claim that phenomenology can be naturalized, that is, brought into the fold of the natural sciences. On some accounts, we can even, as it were, bracket the interpretation provided by Husserl of his own philosophical project and only retain its specific, "scientific" content: that is, we can retain his descriptions of lived experience, and abandon his foundational philosophical project and his anti-naturalism. Of course, this attempt to naturalize transcendental phenomenology raises a number of thorny questions. Is it possible to advocate some variety of naturalism from within the framework of transcendental phenomenology without *ipso facto* jettisoning this framework entirely? Are Husserl's arguments against naturalism, and especially against psychologism, still probative? Can his critique be met with an adequate response today? Can there be a rapprochement of transcendental phenomenology and

the natural, experimental sciences (especially cognitive science) that does justice to each party?

My general aim in this thesis to examine if, and how, naturalistic epistemology and transcendental phenomenology can inform one another in such a way that the exchange is mutually enlightening. I have chosen to examine two points of contact to asses this rapprochement. The first of these, which is examined in the first chapter, concerns the issue of naturalism in transcendental phenomenology, that is, the relevance of the natural sciences for the transcendental phenomenological project. The aim of this first chapter is to evaluate whether a variety of naturalism is amenable to Husserl's project as he understood it. The second point of contact, explored in the second chapter, concerns the central, contentious epistemological issue of psychologism. The aim of the second chapter is to step outside of Husserl's framework and examine an independent argument for psychologism, or a psycho-epistemological argument. My hope is that this research will, if not elucidate how a rapprochement of transcendental phenomenology and naturalistic epistemology is possible, at least show where the main points of contention and tension lie.

2. Naturalizing what? Varieties of naturalism and transcendental phenomenology

The first chapter was published in the journal *Phenomenology and the Cognitive Sciences* in 2014 (Ramstead 2014). It situates itself squarely within the confines of the programme laid out by Husserl, and attempts to identify at least one form of naturalism that is compatible with Husserl's project. The main purpose of the first chapter is to determine the extent to which one can endorse naturalism without losing sight of the specific contribution of transcendental phenomenology to philosophy. The chapter thus takes for granted that Husserl's arguments against naturalism are probative. I argue that

there is room for naturalism, albeit of a restricted kind, within Husserl's transcendental framework. More specifically, I argue that the view I label "weak methodological naturalism," is not only compatible with, but also complementary to, even the most idealistic expression of Husserl's project.

Now, as I have indicated, one of the principal factors that makes a rapprochement of transcendental phenomenology and naturalistic epistemology difficult is that the kind of phenomenology that Husserl inaugurates, of the transcendental variety, is resolutely anti-naturalist. Husserl, in effect, designed his phenomenological foundational project as a radical critique of the naturalistic project in philosophy. Husserl claimed that naturalism was a viciously circular and nonsensical doctrine and that naturalistic philosophy was hopelessly powerless to provide the kind of foundations sought by the phenomenologist. Husserl resisted the new, scientific philosophies that had emerged after the fall of German Idealism with the death of Hegel in 1831, and his arguments against naturalism quickly became philosophical canon. Husserl devoted much effort to systematically arguing that naturalistic philosophy, insofar as it aimed to provide a foundation for the sciences, was doomed to fail. Philosophy, in its epistemological duties, was for Husserl irreducible to, and autonomous from, the natural sciences. But is this the last word? Are all forms of naturalism inimical to Husserl's project?

The first chapter, which addresses this question, is comprised of five sections. The first section of the chapter devotes itself to a conceptual analysis of naturalism. The term "naturalism" has different meanings depending on its context of use, and as such, different senses of the term can be distinguished, not all of which, I argue, are necessarily positions to which Husserl would have objected. The first section attempts to untangle these meanings, and distinguishes three varieties of naturalism that pertain to three different fields of questions. The first of these is ontological naturalism, the view that all things and properties are, or supervene on, natural things and properties. The second is naturalism understood as a methodological position, which admits of two

variants: strong methodological naturalism is the meta-philosophical view that philosophy ought to be continuous and homogenous with the methods of the natural sciences, whereas weak methodological naturalism demands only that philosophy be coherent with the natural sciences. Naturalism, finally, is also an epistemological position, to the effect that knowledge claims only count as *bona fide* knowledge claims insofar as they pertain to natural things, regularities, and properties (this is the strong variant), or to those and also to formal things, regularities, and properties such as those of logic and mathematics (this is the weak variant).

Having distinguished these varieties of naturalism, I move in the second section to contemporary attempts to naturalize phenomenology and attempt to determine what varieties of naturalism motivate this project. I first examine "neurophenomenology," a research programme aiming to integrate two kinds of scientific data into "ontologically neutral" mathematical models: these are neurophysiological and behavioral data, obtained by experimental techniques such as measurements of response latency, fMRI, and MEG, on the one hand, and "phenomenal data," that is, first-person, or qualitative data obtained through introspection and verbal report, on the other hand. I then examine "front-loaded" phenomenology, which directly builds the results of phenomenological descriptions into experimental protocol to inform experimental design. I end the second section with an examination of formalized approaches to phenomenology, which attempt to formalize the invariant or essential structures of lived experience using contemporary formal tools such as morphodynamics, dynamical systems theory, and mereotopology. This brief study of the main forms of the projects to naturalize phenomenology concludes that their advocates endorse all three varieties of naturalism discussed in the first section.

The third section examines Husserl's position on the three varieties of naturalism distinguished above. I first argue that Husserl rejected epistemological naturalism. The father of transcendental phenomenology held that there exists a domain of universally

valid statements, the validity and universal scope of which pertained neither to the natural nomological kind of necessity associated with empirical regularities, things, and properties, nor to the formal necessity that is characteristic of mathematics and logic. This domain is that of the "material essences" or "*eidē*" and the "material *a priori*" laws that pertain to them. The truth value of these material *a priori* laws depends neither on the real causal relations, nor on the formal relations, between the terms that figure in them, but refer instead to the content of the terms, or essential properties, presented therein. I then move to the methodological variety of naturalism, the strong version of which Husserl rejected as well. Husserl rejected this form of naturalism because he viewed philosophy as an autonomous and rigorous science, armed with its own irreducible set of methodological principles: the various "reductions" (the *epochē* and the *Wesensschau*). Both reductions consist in a change of attitude towards our lived experience. The use of these reductions is the specific methodological contribution of phenomenology, which distinguishes it from the natural sciences, and also comprises one of its unique contribution to the history of philosophical thought. The project to naturalize phenomenology, from a transcendental phenomenological point of view, errs because it instrumentalizes phenomenology, by subordinating the rigorous descriptive work of phenomenology to the imperatives of naturalistic research and formalization. The specific task of transcendental phenomenology is to elaborate a descriptive account of material essences and material *a priori* laws. Husserl thus rejected epistemological naturalism as well, in both its weak and strong variants, because the domain open to phenomenology is irreducible to the empirical or the formal. The very possibility of Husserl's transcendental phenomenological project depends on the autonomy and irreducibility of this domain.

I conclude the third section by discussing Husserl's rejection of ontological naturalism. As we have just seen, according to Husserl, there exist a kind of non-spatial, non-temporal entity, grasped on the mode of the "how" (*sein Was*), what he called "essences." An essence consists in the unity of certain kinds of invariants of lived

experience, irreducible to the particulars that instantiate them. The domain of interest for phenomenology is that of material (rather than formal) essences, essences related to the content of what is present to conscious experience. These essences, argued Husserl, are directly accessible in intuition through the *Wesensschau*, the seeing of essences. For instance, while it is true that inner time consciousness exist as "this consciousness here," that is, as the actual consciousness of this particular person, for phenomenological eidetic analysis, consciousness is grasped and described, first and foremost, as a material essence or invariant unity, which has a different ontological status than the concrete individual consciousness—that is, it exists as a universal and invariant structure of any possible experience. Because he argued that there exist non-natural things, Husserl rejected ontological naturalism as well.

There seems, then, to be an unbridgeable gap between Husserl's transcendental phenomenology and the three varieties of naturalism examined above. Prospects for a rapprochement seem difficult. To remedy this situation, the fourth section examines the weaker, minimalist version of methodological naturalism. This is a conditional version of the position, to the effect that, *if* an entity *X* is a natural entity, *then* the best methods for the study of *X* are those provided by the natural sciences. The first part of the fourth section aims to clarify the status of the antecedent of this formulation, and attempts to show that Husserl regarded as legitimate to treat what he called the lived body (*Leib*) and the mind (*Seele*) as part of the ontological region called "nature," and thus as falling under the extension of *X*. As such, Husserl recognizes that it is legitimate, at least within certain limits, to treat of the *Leib* and *Seele* as part of nature, as natural things with natural properties, subject to natural nomological regularities, without lapsing into ontological natural*ism*.

The second part of the fourth section aims to show that Husserl thought it was legitimate to study these specific natural things, the lived body and the mind, with the methodologies specific to the natural sciences. Husserl even proposed a specific natural

science, called "somatology," the object of which was the corporeity (*Leiblichkeit*) of the lived body, that is, the openness or "sensitiveness" (*Empfindsamkeit*) to the world that makes it a lived body *per se*. The aim of somatology is to elucidate the functional rapports between changes in the states of certain parts of the living physical body (*Leibkörper*) and the correlative changes in certain parts of the sensory field (what he called "physical somatology"), as well as to study the correlated changes between the different aspects of the sensory field themselves (what Husserl called "aesthesiological somatology"), using the methods of the experimental natural sciences, especially experimental psychology. Husserl was thus a naturalist in this very restricted sense of the term: he endorsed weak methodological naturalism.

Having shown that at least one form of naturalism is compatible with Husserl's project, the last, fifth section of the chapter attempts to show that the registers of transcendental phenomenology and of the natural sciences do not stand in contradiction to one another, but are rather complementary. I first study the epistemological function that Husserl ascribed to transcendental phenomenology with regard to the natural sciences. Its role, he argued, was to provide the latter with a principled epistemological justification of their knowledge claims and to clarify the material *a priori* laws of the ontological regions (e.g., nature) investigated by the sciences. I then suggest that it is possible to view some of the natural sciences, within Husserl's framework, as what I call "sciences of constitution," that is, as sciences whose aim it is to study the specific functional role of certain parts of the real world, notably parts of the lived physical body, in the "constitution" or disclosure of meaningful unities in lived experience. I suggest that the function of these sciences of constitution can be understood, within the strict limits of Husserl's framework, as that of elucidating the empirical conditions for the occurrence of certain kinds of meaningful unities (e.g., a visual datum, or a sound experience) in the conscious experience of given psychophysical embodied agents.

The first chapter went through three very extensive rewrites in response to commentary from reviewers at *Phenomenology and the Cognitive Sciences*. I have decided against modifying it further: the chapter appears in essentially as it was published in *Phenomenology and the Cognitive Sciences*, albeit with slightly a different citation format. I shall now respond to useful remarks that were made with respect to this chapter, and indicate how responding to these comments helped to shape the second chapter. One of my evaluators remarked that my distinction between the weak and strong variants of methodological naturalism was almost trivial. Indeed, he suggested, on the account provided, everyone is a weak methodological naturalist. The point of making the distinction was to show that, in effect, Husserl did consider the *Leib* and *Seele* as part of nature. This claim is not trivial, insofar as one of its consequence is that both the lived body and the mind can be studied by the natural sciences within the transcendental phenomenological framework, which is the kind of concession the chapter was seeking. Husserl regarded an entire domain of things, the domain of material essences and material *a priori* laws, as essentially non-natural, and he described many central objects of transcendental phenomenological inquiry as such things: the invariant structure of consciousness, or "transcendental consciousness," was one such thing. Husserl, again and again, made it clear that such things are not amenable to experimental inquiry. It is thus not a trivial remark to claim that, for Husserl, the lived body and the mind are part of nature and subject to naturalistic methodologies. (Note that I decided to drop the distinction between strong and weak variants of methodological naturalism in the second chapter, because such a fine-grained distinction would not have been helpful.)

Another evaluator made a number of remarks that would greatly inflect the writing of my second chapter. The first was that I ought to justify the period of texts covered in Husserl. Why did I not choose to focus on Husserl's early works, or again on the later works, where questions epistemological are more clearly brought to the fore, and where Husserl softens his apprehensions with regard to psychology? Simply put, I wanted to

see if Husserl's project was compatible with naturalism when it was expressed in its most radically idealistic and anti-naturalistic form. To me, this corresponds to his writings in the early 1910s, especially the *Ideen* series. However, it may indeed have provided more points of contact to address Husserl's later writings, especially the *Krisis*. This is one of the many limitations of this thesis. This evaluator also suggested that I stick to contemporary issues in naturalistic epistemology, and that I focus my propos on the problems related to psychologism, which are really *le nerf de la guerre* when discussing the link between phenomenology and naturalism. I think he is exactly right. I have devoted the second chapter to addressing this question in the context of today's naturalistic approaches to epistemology.

3. Buried alive? A study of psychologism and the epistemic capacities of concrete agents

The second chapter of the thesis, in contradistinction to the first, departs significantly from Husserl's framework. The chapter investigates the renewed form of psychologism that has been operative in contemporary epistemology at least since Quine's 1969 paper "Epistemology naturalized." The aim of the chapter is to evaluate this resurgence and to propose an argument for a weak, "collaborative" form of psychologism. This form of psychologism would supplement epistemology with the methods of experimental psychology, instead of replacing it entirely. In order to make this argument, the second chapter explores a central transformation in contemporary epistemology, which is today interested (among other things, of course) in the epistemic capacities of concrete epistemic agents such as ourselves, as opposed to the essence (the definition in terms of necessary and sufficient conditions) of knowledge. The chapter argues that if as we accept this transformation, then a weak form of psychologism is entailed.

The second chapter is divided into two main parts. The first part consists of three sections. The first section deals with the history of psychologism in the 19th and 20th centuries. Although psychologism, as the historian of philosophy will note, was for most of the discipline's history the *de facto* position of most epistemological thinkers, it was buried at the beginning of the 20th century, to the point where, by the 1920s, it was mostly taken for granted that it had been refuted as a serious philosophical doctrine. The first section thus examines the rise of psychologism after the death of Hegel in 1831, its fall at the turn of the century at the hands of Husserl, and its resurgence with the work of Quine and others starting in the late 1960s.

But just what is psychologism? Much like naturalism, psychologism admits of different definitions. At the turn of the 20th century, when the great dispute over psychologism (*Psychologismus-Streit*) was tearing a rift in German philosophical circles, the term was being used ambiguously: many different positions, arising in quite heterogeneous domains, were labelled "psychologistic": positions arising in metaphysics, ontology, epistemology, and logic, of course, but also ethics, aesthetics, sociology, religion, and pedagogy, to name just a few, were given the label. To speak of psychologism *simpliciter* would make the discussion on offer simply intractable, given the wealth of positions described in this way. As such, the chapter attempts to situate psychologism with respect to the varieties of naturalism that were presented in the first chapter. These varieties are taken up and expanded upon in the first second. In the sense relevant to debates over naturalistic epistemology, psychologism is a form of naturalism. Psychologism, generally speaking, is the view that *experimental* psychology ought to either replace or inform epistemology. It is thus a species of naturalism whose source and target have been specified: psychologism is a form of naturalism having as source a specific discipline, namely experimental psychology, from which it draws methodological insight, and having as specific target discipline epistemology. Moreover, one can be more specific and claim that psychologism today is a form of epistemological and methodological naturalism. From my earlier typology of

naturalism, I argue that we can define a strong, or "replacement" variant of psychologism, as a combination of strong epistemological naturalism and methodological naturalism, as well as a weaker, "collaborative" form of psychologism, as a combination of weak epistemological naturalism and methodological naturalism. (Note that the definition of weak epistemological naturalism was changed slightly from one chapter to the next to better suit the argument of the second chapter.)

The third section, which closes the first part of the chapter, discusses a major transformation in contemporary epistemology, which marks the divide between the epistemology of Husserl's time and ours today. Contemporary epistemology, I argue, is no longer solely interested only in the justification of knowledge in the abstract, but also in the specific epistemic capacities of what I shall call "concrete epistemic agents," that is, flesh and blood, embodied, historically and culturally determined epistemic agents. This shift in the conception of epistemology has a number of consequences for epistemological research, the most prominent of which is to focus its descriptions (at least occasionally) on how it is that concrete agents such as ourselves manage to acquire information about and know the world around us. Contemporary epistemology thus leaves behind the abstract, "pure" or "transcendental" subject of knowledge, in favor of an embodied and historical approach to the epistemic agent that takes the finite nature of the agent as point of departure. I conclude this section with a brief review of Husserl's arguments against psychologism, which were addressed at length in the first chapter. The aim of this overview is only to show that Husserl's arguments, although they became canonical in the history of philosophy, were not unopposed, and were subject to vociferous debate and critique even at the time he was writing them.

The chapter then moves, in its second part, to a discussion of an argument for weak psychologism. The argument moves to a conditional conclusion: if we accept the premise that there exist world-disclosing capacities, things done by concrete epistemic agents, which are relevant to epistemology (among the many other things that interest

epistemology), then it follows that epistemology ought to be informed by the set of sciences that provide explanations for those capacities. This is arguably the central issue of contention in the dialogue with transcendental phenomenologists. A disagreement is bound to emerge here between naturalists and transcendentalists: for, what is at stake is ultimately two different conceptions of what the epistemological agent consists in. Naturalists and transcendental phenomenologists might thus part ways at this point in the argument (the very first premise), which might spell doom for a potential rapprochement of the kind I had been aiming at. As indicated, however, if we can precisely situate the disagreement, at the very least, some progress will have been made: we shall understand why the abyss yawns between both research programmes. The entire argument explicitly rests on accepting this first premise, and recognizing the paradigm shift operative in recent epistemology.

The argument itself is as follows:

> (1) An epistemic world-disclosing capacity C^*, which is characteristic of concrete epistemic agents, is epistemically relevant to epistemology (among other things)
>
> (2) There exists some cognitive science N, such that N can provide an explanation of the relevant epistemic world-disclosing capacity C^*, by functional analysis/decomposition of C^* into organized operations $f \in F_{C^*}$, and/or by mechanistic analysis of C^* into cognitive mechanisms $m \in M_{C^*}$ (among other things), or both
>
> (3) For any two disciplines D_1 and D_2 (e.g., epistemology and cognitive science) and a given capacity C (e.g., C^*): if C is epistemically relevant to D_1 and C is explained by D_2, then D_1 ought to be informed by D_2
>
> (4) If C^* is epistemically relevant to epistemology, then epistemology ought to be informed by N.

The chapter then justifies all the main premises and some ramifications of the conclusion for epistemology. In order to address the reproach of committing the naturalistic fallacy, that is, to claim that the argument drives normative statements (with the normative modality "ought to") from statements of fact (with the factual modalities "is," "exists"), I first discuss claim (3).

The purported naturalistic fallacy is avoided by appealing to a design or engineering perspective on epistemic normativity, that is, the idea that it is possible to engineer or otherwise design (e.g., through natural selection) a process to make it "better" if we can provide a terminal parameter for that process. A terminal parameter, in this sense, is what the relevant system does, that is, what it achieves, under normal conditions. The terminal parameter of, say, visual processing is a representation of the visual scene. Once this is specified, we can consider how the process might be carried out adequately, that is, we can consider the process through the lens of normativity. I argue that to specify such a terminal parameter opens onto normative considerations, in two different senses. First, one can think of the terminal parameter in terms of rational epistemic action. The general principle of rational action we can appeal to is: if, in a set of conditions X, an agent S aims to achieve an objective O, and if, in those same conditions X, a given action A allows S to achieve O, then S *ought* to do O. In the case of epistemic capacities, the claim is about rational epistemic action. The principle that we can appeal to is: that if, in a set of conditions X, an epistemic agent S aims to account for some epistemic capacity C^*, and if, in those same conditions X, to be informed by a cognitive science N allows S to provide an explanatory account of C^*, then S *ought* to be informed by N. Second, I suggest that we can also provide a normative account of the in terms of Millikan's proper functions. Proper functions can fail to be carried out, which means that, if we assume a terminal parameter, their being carried out can be construed as normative. Proper functions also have "normal conditions" of operation, which add another dimension of normativity to the account: these functions

can fail to be carried out if certain conditions are not satisfied. In either account of normativity, the naturalistic fallacy is avoided by appealing to design considerations.

Having addressed the naturalistic fallacy, the argument is unfolded in a stepwise manner for the remainder of the claims. Claim (1), which was justified in the third section, is the claim that today, epistemology is interested, e.g., will find it explanatorily relevant to cite, world-disclosing capacities of concrete agents (among other things). Of course, as we have seen, this is the claim that will meet the most resistance among traditional epistemologists such as Husserl. We can also note that claim (1) leads only to weak psychologism, because it does not claim that epistemology ought to be replaced by a study of epistemic capacities, but rather that it is interested in such capacities among other things. I consider the candidate capacity of being in an intentional, interpretive relation with the world as an illustration of such a world-disclosing capacity.

So far, then, we have argued that if a given cognitive science can provide an explanation of a given capacity, and if epistemology is interested in this capacity, then epistemology ought to be informed by cognitive science. The chapter turns to claim (3), and examines whether such an explanation can be provided in principle. This part of the chapter presents functionalist analysis and decomposition, as well as mechanistic analysis, as two candidate forms of explanation for epistemic capacities. What is called a functional explanation of a capacity is an explanation that decomposes the capacity into its constituent operations and their organization. Mechanistic analysis couples this functional description of the capacity with an analysis of the physical parts that carry out the operations. Both kinds of explanation can be appealed to independently, but each illustrates that a given epistemic capacity can be explained by at least one kind of cognitive science.

Having justified all the premises of the argument, the chapter proceeds to the conclusion and its ramifications. After discussing some of the ways psychology might clarify epistemological questions, I sketch a response to Husserl's arguments against psychologism. Husserl argued, as we have seen in the first chapter, that psychologism leads to vicious circularity and relativism. I respond to the accusation of vicious circularity by appealing to design-normative considerations and to the fall of foundationalism in philosophy. I then sketch a response to the accusation of relativism by pointing out that most cognitive architectures suppose that at some level, the system is in direct causal connection with states of affairs in the world, which are non-relative. Thus, although knowledge about the world may be relative, the state of affairs is not, and can be more or less reliably drawn upon by the organism in trying to make sense of the world. This allows us to counter the accusation.

In summary, the present thesis represents an attempt to bridge naturalistic epistemology and the transcendental kind of phenomenology inaugurated by Husserl. In the final analysis, I believe that the end result is less a rapprochement, as I had initially intended, and more a depiction of why the conversation between both research programmes is difficult. I have shown that transcendental phenomenology is open to a form of naturalism, but this form is much weaker than what partisans of the naturalization project, both in epistemology and in phenomenology, typically endorse. As such, my account may prove unsatisfactory to the latter. Conversely, naturalistic epistemology significantly seems to rely on a new conception of the epistemic agent, one that is directly at odds with Husserl's conception of the epistemic subject as absolute or transcendental consciousness. Although I do not believe that I have managed to bridge the abyss between transcendental phenomenology and naturalism, we can at least see where it yawns.

CHAPTER I

NATURALIZING WHAT? VARIETIES OF NATURALISM AND TRANSCENDENTAL PHENOMENOLOGY

Introduction

The aim of this chapter is to reappraise the attempt to bridge phenomenology and the natural or empirical sciences (particularly cognitive science). Specifically, I wish to address the relevance of the natural sciences for transcendental phenomenology, that is, the issue of naturalism. I suggest that to evaluate this relevance, we must directly address the transcendental dimension of Husserl's phenomenology. The chapter itself is divided into five sections. Because the concept of naturalism *simpliciter* is too blunt an instrument to conduct this investigation, in the first section, I distinguish three varieties of naturalism and corresponding kinds of naturalization: an epistemological form (with strong and weak variants), a methodological one (also with strong and weak variants), and an ontological one. Having clarified the concept of naturalism, I turn in the second section to the projects that aim to "naturalize phenomenology." There, I examine neurophenomenology, front-loaded phenomenology, and formalized approaches to phenomenology in light of their commitments to these varieties of naturalism. This overview leads me to consider in the third section the fundamental commitments of Husserl's transcendental phenomenology, and to evaluate the coherence of his project with the previously discussed varieties of naturalism. I argue that Husserl rejects strong and weak forms of epistemological naturalism, strong methodological naturalism, and ontological naturalism.

At this point in my argument, the prospects for a rapprochement between naturalism and transcendental phenomenology seem rather bleak. The fourth section attempts to remedy this situation; it presents the argument that Husserl endorsed a weak,

conditional form of methodological naturalism with regard to the lived body and the mind. I illustrate my point with Husserl's proposal of a science apt to study the corporeality (*Leiblichkeit*) of the lived body (*Leib*), which he called "somatology." Having established that at least one variety of naturalism is coherent with Husserl's transcendental phenomenological project, the issue arises of determining the relation between naturalistic investigations and transcendental phenomenological ones. In light of this issue, the fifth and final section addresses the possible complementarity and respective limits of the transcendental phenomenological and the natural scientific frameworks. I argue that, on Husserl's account, transcendental phenomenology is a foundational epistemological framework; its function with respect to the natural sciences is to provide them with a foundation for their claims to knowledge and to clarify their ontologies. I suggest that certain natural sciences can be viewed, within Husserl's transcendental phenomenological framework, as "sciences of constitution," that is, as natural sciences investigating the real structures that act as conditions of possibility for the occurrence of comprehensive unities in the experience of embodied subjects. The upshot of my discussion is that the natural sciences can make a specific contribution to the transcendental phenomenological edifice without usurping the function of transcendental phenomenology.

1. Naturalism and transcendental phenomenology

Recently much attention has been devoted to the possibility of a meaningful encounter of phenomenology and the natural sciences, and specifically with cognitive science.[1] It

[1] Of late, this has been an active field of study and has generated a substantial literature. Recent book-length illustrations of the attempt to bridge phenomenology and cognitive science include: Kiverstein & Wheeler (2012); Edelman, Fekete, & Zach (2012); Rowlands (2010); Gallagher & Schmicking (2010); Berthoz & Petit (2008); Thompson (2007); Gallagher & Zahavi (2007); Wheeler (2005); Petitot et al. (1999b). This is not an exhaustive list. I shall use the singular "cognitive science" (rather than the plural

has even been suggested by some that phenomenology could be naturalized. Others, however, take phenomenology to be opposed to naturalism and natural scientific explanations as a matter of principle, and regard "naturalized phenomenology" as a contradiction in terms. This makes the proposed rapprochement a thorny issue. Is naturalism relevant to transcendental phenomenology? Are they compatible, or is naturalism fundamentally incoherent with the transcendental perspective?[2]

What is "naturalism"? The term has various meanings depending on the context in which it is used, and my attempt to define it can only be partial. Naturalism, as I shall be using the term, can be understood as a position arising in three domains: the methodological, the ontological, and the epistemological.[3] The term "naturalization" is similarly polysemous. I propose to read it generally as referring to a project undertaken by members of a research community, having as its target a particular domain of inquiry or domain of objects. Broadly speaking, naturalization is the attempt to make these domains of inquiry and/or objects continuous with the natural sciences. The specific way this is brought about depends on the kind of naturalism considered.

Naturalism, as an ontological position, is a form of monism. According to ontological naturalism, there is only one kind of "stuff" that makes up all things, namely "natural"

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form "the cognitive sciences") throughout to refer to the cluster of disciplines working on cognition, including cognitive psychology, cognitive neuroscience, etc.

[2] A *prima facie* objection to my account might consist in arguing that the story presented here is of strictly historical or exegetical interest. The claim that contemporary naturalist epistemology might have any interest in transcendental phenomenology is something that itself needs to be justified. An independent argument ought to be made to establish this significance. I agree. That task, however, exceeds the scope of this chapter. My aim here is only to evaluate the relevance of the natural sciences for Husserl's transcendental phenomenological project. I go on the assumption that the contributions of phenomenology are relevant to contemporary naturalist positions.

[3] This distinction is reminiscent of Ayala's distinction between three domains in which questions of reductionism arise (see Ayala 1974). I am also indebted to Zahavi's (2010) discussion of metaphysical and methodological naturalism. The varieties of naturalism I describe in what follows are not mutually exclusive, and they can be combined in various ways.

stuff. Natural stuff is the kind of stuff postulated by the ontologies of the natural sciences, typically (but not always) the ontologies of the physical sciences (e.g., electric charge, mass, energy, etc.). We can define this variety of naturalism as follows:

> Ontological naturalism: the position that all things and their properties are natural things and properties, or supervene on natural things and properties.

This has strong ontological implications, because it entails that no other (non-natural) kinds of things or properties exist. Ontologically, the naturalization of a discipline amounts to, e.g., an explication, in Carnap's (1947) sense, of the things and properties postulated by the ontology of that discipline (numbers, persons, values, consciousness, etc.) in terms of natural things and properties. An ontologically naturalized discipline accounts for all the phenomena of interest pertaining to it on the basis of these entities and properties alone. We should note that "to naturalize a thing" or "to naturalize a property" are shorthand expressions. They are elliptical; they refer to a systematic change in the conceptual or semantic network mobilized to account for a given class of phenomena, and not to a change in the ontological properties of the object considered *per se*. That is, to naturalize a thing entails that one mobilizes only those concepts that pertain to the ontologies of the natural sciences to explain a given phenomenon, and to abandon those concepts that were previously used to account for it which are not part of the lexicon of the natural sciences. If an entity or a property is non-natural as a matter of fact, then no effort on our part can change this fact about it. We can, however, change the way we think and talk about these entities and properties. I propose, then, to read the expression "to naturalize a thing or property" throughout as meaning "to give an explanatory account of a thing that is coherent with the ontologies of the natural sciences." It is thus a manner of speaking about a change in our conceptual apparatus or semantic network with regard to a thing or property that was heretofore not conceptualized as a natural one.

When it arises in the methodological domain, naturalism is the meta-philosophical view that philosophical fields of inquiry (e.g. epistemology, ethics, metaphysics) should employ, or at least be coherent with, the methods of the natural sciences (such as the use of empirical experiments, the operationalizing of concepts, and so forth) and their criteria for justification (e.g., parsimony, simplicity, predictive power, reproducibility of results, etc.). We can define a strong and a weak variant of this position. The strong variant can be stated as follows:

> Strong methodological naturalism: the position that philosophy and the natural sciences ought to be in methodological continuity; i.e., that the former should all adopt the methods and criteria for justification employed in the latter.

The implication of strong methodological naturalism for philosophy is that it has no methodological autonomy. This is quite a strong claim. A weaker reading of the methodological naturalist position, one that will become important later in my argument, would take the form of a conditional constraint. This weaker reading of methodological naturalism restricts the scope of the proposition; it does not apply to all discourses and objects in philosophy, and pertains only to the study of those entities and properties which are construed as natural entities or properties. We can define it as follows:

> Weak methodological naturalism: the position that *if X* is a natural entity or property, *then* the most adequate method for its study is one coherent or continuous with those of the natural sciences.

We should note, however, that such a position is only available if one rejects ontological naturalism. After all, if all things and properties are natural things and properties, then by implication one must espouse the stronger version of the thesis, because every thing and property trivially fall under the extension of the antecedent.

When naturalism is read this methodological way, the naturalization of a discipline amounts to making the methods and criteria for justification of that discipline either coherent with (weak methodological naturalism), or continuous with (strong methodological naturalism), those of the natural sciences.

The third, epistemological form of naturalism is the view that the only valid and justified form of knowledge is empirical knowledge, knowledge pertaining to natural things and properties, and natural nomological regularities. Here, we can again define two variants. A strong reading of this position requires that all legitimate forms of knowledge be explicable strictly in terms of empirical knowledge. We can state this precisely:

> Strong epistemological naturalism: the position that for any field of study to qualify as a *bona fide* scientific enterprise providing a legitimate form of knowledge, that field must provide empirical knowledge about natural nomological regularities and particulars.

The partisans of strong epistemological naturalism thus attempt to show that all legitimate knowledge claims can be explicated in terms of empirical ones. This is a very strong position, perhaps too strong for most readers. A slightly weaker reading of epistemological naturalism might also acknowledge the legitimacy of formal knowledge, knowledge pertaining to formal entities such as those found in mathematics and logic. This weaker position can be defined as follows:

> Weak epistemological naturalism: the position that for any field of study to qualify as a *bona fide* scientific enterprise providing a legitimate form of knowledge, that field must provide either empirical knowledge about natural nomological regularities and particulars, or formal knowledge about logical and mathematical entities, structures, and relations.

Epistemologically, the naturalization of a discipline would be an attempt to explicate the claims made by a target discipline, e.g. the normative claims made by epistemology, either exclusively in empirical terms (strong epistemological naturalism) or with a combination of empirical and formal claims (weak epistemological naturalism). The projects for a "naturalized epistemology" are the logical outcomes of such a position.[4] Having examined these three varieties of naturalism and naturalization, we can now turn to the various attempts to bring them into contact with phenomenology.

2. The naturalization of phenomenology

This section addresses the claim that phenomenology can be naturalized. Recent projects aiming to connect phenomenology and the natural sciences have taken the form of attempts to "naturalize phenomenology." The main figures in this project are Varela, Thompson, and Lutz's proposal of a "neurophenomenology," Gallagher's "front-loaded phenomenology," and the various formalized approaches to phenomenology.[5] What the naturalization of phenomenology amounts to should be clarified. Much hangs on the questions of what we are attempting to naturalize, and how such a naturalization is carried out. As such, the aim of this section is to examine

[4] A few examples of epistemological naturalism include P. M. Churchland (1989; 2007), P. S. Churchland (1986), Giere (1990; 1999; 2010), and Giere et al. (2005). These projects are intellectually indebted to the pioneering work of Quine, who first proposed a naturalized epistemology in the contemporary setting. In "Epistemology naturalized" (1969), Quine first argued that the proper construal of contemporary epistemology is "as a chapter of psychology and hence of natural science" (1969, 82). Given the failure of logical empiricism, notably of Carnap's project of rational reconstruction exemplified by his *Der Logische Aufbau der Welt* (1928), to ground and ultimately justify the doctrinal (i.e. truth- and justification-related) aspects of scientific investigation, the best course of action for philosophy, if it is still to attempt to ground knowledge claims at all, is according to Quine to "settle for psychology" (*ibid.*, 75). This sets the tone for contemporary naturalization projects.

[5] Note that these three approaches are not mutually exclusive. See Gallagher (2012) for a review and discussion of these approaches.

the project of naturalizing phenomenology in light of the varieties of naturalism discussed above.

2.1. The epistemological and methodological naturalization of phenomenology

Transcendental phenomenology, as we shall see in section 3, is a foundationalist epistemological project, aiming to ground all possible knowledge claims. It has recently been argued that the unilateral foundationalism of the transcendentalist position is no longer tenable in contemporary epistemology. Calls for putting aside foundationalism, abandoning "pure phenomenology," have become numerous, as well as those hoping to develop "a new understanding of phenomenology" (Gallagher & Sørensen 2006, 120), one that can "separate itself from the idea that it can be free standing" (Noë 2007, 234), autonomous and foundational. Murray (2002) has even suggested that philosophy in general and transcendental phenomenology in particular suffer from an "anteriority complex," from the delusion that somehow epistemology could be carried out before, and separately from, the natural sciences. According to this line of reasoning, foundationalism is a historical residue in Husserl's thought, a kind of hangover from a passé foundationalism, to be overcome by contemporary thought. A popular way to overcome this 'anteriority complex' is to propose a redefinition of phenomenology, not as a foundationalist enterprise but rather as an equal partner in a mutually constraining relationship with cognitive science.

I shall examine the three naturalized approaches to phenomenology just mentioned in light of their epistemological and methodological commitments. Neurophenomenology is a research program in cognitive neuroscience. Its most prominent protagonists are

Varela (1996) and Thompson (2007). The approach has garnered much support.[6] Neurophenomenology employs two kinds of data in mathematical models that are ontologically neutral: "phenomenological data," usually obtained through the use of first-person data collection methods (usually from subject reports), and neurophysiological data, obtained from, e.g., EEG or fMRI experiments.[7] These kinds of data are 'mutually constrained' by being integrated into an overarching mathematical model, usually formalized with dynamical systems theory (DST), such that this model could be used to correlate phenomenological experience with patterns of neuronal activity. As Lutz and Thompson summarize,

> neurophenomenology is based on the synergistic use of three fields of knowledge:
> 1. (NPh1) First-person data from the careful examination of experience with specific first-person methods.
> 2. (NPh2) Formal models and analytical tools from dynamical systems theory, grounded on an embodied-enactive approach to cognition.
> 3. (NPh3) Neurophysiological data from measurements of large-scale, integrative processes in the brain. (Lutz & Thompson 2003, 34)

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[6] A host of authors have joined Thompson and Varela's call for a neurophenomenology. See Thompson, Lutz, & Cosmelli (2004) for an accessible introduction to neurophenomenology. Neurophenomenology was a research topic in *Frontiers in Human Neuroscience* (Hasenkamp and Thompson 2013, 17 articles).

[7] Neurophenomenology is one of the recent attempts to address the need for a systematic integration of "first-person" data into the study of the neurological basis of conscious experience. "Phenomenological data" is another term for first-person introspective data. As Lutz and Thompson write, "Neurophenomenology stresses the importance of gathering first-person data from phenomenologically trained subjects as a heuristic strategy for describing and quantifying the physiological processes relevant to consciousness. The general approach, at a methodological level, is (i) to obtain richer first-person data through disciplined phenomenological explorations of experience, and (ii) to use these original first-person data to uncover new third-person data about the physiological processes crucial for consciousness. Thus one central aim of neurophenomenology is to generate new data by incorporating refined and rigorous phenomenological explorations of experience into the experimental protocols of cognitive neuroscientific research on consciousness." (Lutz & Thompson 2003, 32). Phenomenological data are thus epistemic objects of a new kind, obtained through the self-observation of a subject's experience and subsequent verbal report on that self-observation. These data are then correlated with "third-person" data, such as behavioral or neurophysiological data, into an overall mathematic model.

The claim is that mathematical models drawn from DST enable us to bridge the "explanatory gap" between physical and phenomenal properties by showing that both are explained by the kinds of mathematical relations described in the models.

One of the clearest formulations of how phenomenology is supposed to relate to cognitive science in the project of neurophenomenology is found in Borrett, Kelly, and Kwan's (2000) proposal, according to which the proper relationship of phenomenology to cognitive science would be that of data to model. In the wake of Varela, they argue that

> the right relation between phenomenology and brain science is that of data to model: brain science is ultimately concerned with explaining the way the physical processes of the brain conspire to produce the phenomena of human experience; insofar as phenomenology devotes itself to the accurate description of these phenomena, it provides the most complete and accurate presentation of the data that ultimately must be accounted for by models of brain function. (Borrett, Kelly, & Kwan 2000, 214)

On both Lutz and Thompson's and Borrett, Kelly, and Kwan's accounts of neurophenomenology, phenomenology can be most easily integrated with the cognitive sciences when instrumentalized: for both groups of authors, it serves as a method to generate phenomenological data. What differs in their accounts is the kind of model employed in tandem with the data generated by phenomenological analysis, but the role of phenomenology remains the same.

That said, the question arises as to how such use of phenomenological data differs from more traditional uses of first-person qualitative data. What differentiates the two, according to Lutz and Thompson (2003), is that the subjects are trained to become familiar with a certain class of experiences, and that the subjects help define the categories employed in analysis. This is meant to capture the idea that phenomenology

proceeds through intersubjective validation of experiential structures. The latter are taken to be "essences" in the Husserlian sense (which we shall examine in detail in the next section), given that they describe invariant structures of experience that seem relatively stable across subjects (because validated intersubjectively).

Front-loaded phenomenology, advocated by Gallagher (2003; 2010), on the other hand, attempts to build phenomenological insights directly into experimental design, avoiding the need to train specialist subjects. For the front-loaded phenomenologist, the mutual constraints play out mainly at the level of inter-theoretic discourse. On the one hand, phenomenology allows cognitive science to refine its descriptions of the objects it tries to explain and to propose more adequate experimental designs. As Gallagher and Sørensen say,

> [j]ust as experimental designs can be informed by specific theories, experiments can also be informed by phenomenological insights—that is, insights developed in independently conducted phenomenological analyses, or in previous neurophenomenological experiments. In such cases phenomenology is "front-loaded" into the experimental design, and there may or may not be any phenomenological method, or even introspection in the strong sense, explicitly used in the experiment itself. (Gallagher & Sørensen 2006, 125)

When they are "front-loaded," the insights obtained through phenomenological descriptions, even if they are not directly involved in scientific experimentation, nevertheless inform and guide the latter, much the way any other theory could be appealed to in designing an experiment. Reciprocally, cognitive science can allow phenomenology to refine its analyses of lived experience. Gallagher (1997) has argued that a sufficiently discriminating cognitive scientific model might prompt our revision of a previous phenomenological description by distinguishing different cognitive mechanisms for what was described in phenomenological analysis as a homogenous process. For instance, if a mental phenomenon that had a homogenous

phenomenological description is revealed, through experimental investigations and model-building, to be realized by two different cognitive mechanisms working in concert, this may motivate us to revisit our description and to ascertain whether our appraisal of it as unitary was warranted (although this has been contested by, e.g., Overgaard 2004, 370–371).

A third approach to naturalized phenomenology is provided by those who wager that the descriptions of classical phenomenology could be made rigorously mathematical by formalizing the structures of lived experience uncovered by phenomenological analysis using various contemporary formal and mathematical tools such as DST, differential geometry, and morphodynamics. Gallagher (2012) usefully refers to this cluster of approaches as the "CREA proposal," because its main protagonists (Petitot, Roy, Pachoud, and Varela) are based at the Centre de Recherche en Épistémologie Appliquée (CREA) in Paris—though we should bear in mind that many others also work in this formalized style (e.g., Edelman, Fekete, & Zach 2012; Fekete & Edelman 2011; and Marbach 2010.) These thinkers would have it that Husserl's motives in opposing naturalism reflected the limits of the state of the art in the science and mathematics of his time. His position on naturalism would thus only be of historical interest. As the editors of *Naturalizing Phenomenology* argue, it is all right to bracket Husserl's philosophical interpretation of his project and only retain phenomenology's "scientific content" (1999a, 52).

Now, the "science of salience" proposed by Petitot and Smith (1997) illustrates the kind of formalized analysis made possible through the direct mathematization of phenomenological descriptions. Its aim is to account for the invariant descriptive structures of lived experience (what Husserl called "essences") through formalization, providing a descriptive geometry of macroscopic phenomena, a "morphological eidetics" of the disclosure of objects in conscious experience (in Husserl's words, the "constitution" of objects). Petitot employs differential geometry and morphodynamics

to model phenomenal experience, and Smith uses formal structures from mereotopology (the theory of parts, wholes, and their boundaries) to a similar effect. Petitot and Smith construct a naturalist account of how macro-level phenomena, with their qualitative structure and salience, emerge from micro-level neurological phenomena, interpreting what Husserl called the unity of the object in morphological terms. Their key insight is that of qualitative discontinuity: objects in everyday phenomenal experience, they argue, appear as salient figures on a ground because their boundaries emerge as qualitative discontinuities, rather than appearing as smooth gradients. Petitot and Smith have formalized several such structures that account for macro-phenomenal appearances in our everyday commonsense experience with the world.[8]

To sum up, neurophenomenology, front-loaded phenomenology, and formalized forms of phenomenology are, in different ways, attempts to bring together cognitive science and phenomenology through an instrumentalization of the descriptive methods of the latter. Neurophenomenologists use descriptive analysis to generate first-person data that is correlated with cognitive and neurophysiological data using the tools of DST (among others). Front-loaded phenomenology uses the insights of Husserlian phenomenology to guide the kind of investigations to be carried out in cognitive science. Finally, formalized approaches start from rigorous phenomenological

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[8] It is not obvious that Husserl would have been open to formalizing the structures of lived experience with mathematical modelling. Husserl described phenomenology as the rigorous study of "inexact essences," rather than the ideal "exact essences" of mathematics and logic, and he believed that the essences specific to phenomenology admitted of no mathematization. See *Ideen zu einer reinen Phänomenologie und phänomenologischen Philosophie*, §§71–75 (hereafter cited as *Ideen I*; second and third volumes as *Ideen II* and *Ideen III* respectively). Any attempt to mathematize the inexact essences of lived experience, he argued, would involve importing mathematical regularities or entities, and as if forcing them on "the things themselves." However, those who approach phenomenology from a formal point of view wager that Husserl's sharp distinction between types of essences was due to the limitations of the scientific state of the art in his time. Indeed, Petitot argues that one must betray the Husserlian text if one is to revive his spirit: "*Nous sommes conscient du fait que cela 'trahit' la lettre de Husserl. Mais c'est la condition* sine qua non *pour faire revivre son esprit*" (Petitot 1993, Introduction, §3).
All page references to Husserl's works refer to the German edition of *Husserliana*, unless otherwise noted.

descriptions of experience, and proceed from there to mathematically formalizing the eidetic macrostructures uncovered therein.[9] Phenomenology is formalized insofar as it is used to generate descriptions of the natural mental phenomena that cognitive science is trying to explain.

The approaches reviewed here can be seen as combining aspects of epistemological and methodological naturalism. That all three approaches endorse a variant of epistemological naturalism is evident in their attempt to explicate the descriptions of the invariant structures of lived experience provided by phenomenology either in terms of natural nomological regularities and particulars, discovered by "mutually constraining" phenomenal and neurophysiological data with formal models (in neuro- and front-loaded phenomenology), or again directly in terms of formal structures (in formalized approaches to phenomenology). All three kinds of "naturalized phenomenology" can be described as endorsing either weak or strong epistemological naturalism, depending on whether or not equal legitimacy is attributed to formal kinds of knowledge. Most approaches today would endorse the weaker thesis.

All three positions also converge on some form of methodological naturalism. In neurophenomenology and formalized approaches to phenomenology, phenomenological descriptions are employed only to the extent that they are put to use in the more encompassing methodological framework, provided by cognitive neuroscience or by the attempt at formalization. Front-loaded phenomenology, as indicated, need not even employ the specific methods of phenomenology at all. As such, all these positions endorse the view that the methods of the natural sciences are most apt to deal with the phenomena described by phenomenology, either directly at

[9] Petitot's (2004) use of phenomenology illustrates this strategy. He starts from the phenomenological descriptions of *III. Logische Untersuchung* and of *Ding und Raum*, and proceeds to their mathematization. Other kinds of phenomenological description, e.g., the theory of pure hyletics, might also be used as the descriptive basis from which to carry out such formalizations. For other instances of this mathematical approach to phenomenology, also see Petitot (1993; 1994; 1995; 1999).

the level of description, or indirectly, by subordinating the methods of phenomenology to those of natural science or formalization. As indicated, the question of whether these positions amount to strong or weak methodological naturalism rests on whether or not they endorse ontological naturalism. To accept the latter *ipso facto* commits one to the strong version of that thesis.

2.2. Ontological naturalization

Contemporary attempts to naturalize phenomenology also seem committed to ontological naturalism. This may in fact be the central claim of the "naturalized phenomenologies." The editors of the volume *Naturalizing Phenomenology* (1999) argue in their introduction to that work that phenomenology holds the promise of closing the "explanatory gap" between physical and phenomenal data, and as such, its use in cognitive science could provide cognitive science with a phenomenologically informed, naturalized account of consciousness (Petitot et al., 2–9). They propose to understand the naturalization of phenomenology as a process that starts from phenomenological descriptions of lived experience, moving from there to naturalized accounts of consciousness, most notably through mathematization (Petitot et al. 1999a, 48ff). To provide a "naturalized phenomenology" on this reading is to put phenomenological descriptions of conscious experience to use in naturalistic approaches, and explain consciousness as a natural thing with natural properties.

Their wager is that this will provide the natural sciences with a framework for a naturalistic explanation of consciousness, as it is described in Husserlian phenomenological analyses, as well as a way to close the explanatory gap between physical and phenomenal properties. Just as the old, Aristotelian ontological distinction between the "sublunar" and the "supralunar" was made obsolete through the

advancement of scientific theory and practice, the naturalization of consciousness as it is described in the analyses of phenomenology will on their account show that there is no ontological divide between the physical and the phenomenal (see Petitot et al. 1999a, 46–49). They argue that the revolution brought about by Galileo and Newton with the emergence of classical mechanics "can be said to result from the *neutralization* of a conflict between the 'sublunar' and the 'supralunar' worlds through the establishment of a *new* division of scientific objectivity" (Petitot et al. 1999a, 46); and the naturalization of phenomenology similarly promises to neutralize the conflict between phenomenal and physical properties.

Perhaps the clearest examples of attempts to ontologically naturalize phenomenology are those providing naturalistic explanatory models for the phenomenological experience of the flow of inner time. Philosophers, cognitive scientists, and neuroscientists have proposed neuro- and cognitive scientific models to account for time consciousness (e.g., van Gelder 1999; Varela 1999a; 1999b; Lloyd 2002; Gallagher & Varela 2003; Grush 2006). Grush's proposal, for instance, makes use of a "trajectory estimation model" to formalize the kind of information processing required for a cognitive system to have a representation of itself and its environment with the temporal "thickness" described in Husserl's analyses of time consciousness.[10] Rather than accept that consciousness and its "essences" cannot, as a matter of principle, be accounted for with naturalistic explanatory models—as Husserl had held, and as we shall see in greater detail presently—these proposals attempt to provide just such an account. Indeed, research projects such as the neurophenomenology of inner time consciousness "directly challenge" the claim that "no analogue of the synthetic unity proper to consciousness is to be found in physical nature" (Thompson 2007, 356). To

[10] Grush's trajectory estimation model builds on his work in the emulation theory of representation (Grush 2004a, 2004b). It is a kind of internal modelling approach to cognition, formalizing a system's capacity to estimate forthcoming states using an internal model of the perceived object or situation. See Grush (2005a; 2005b; 2006).

the extent that they endorse ontological naturalism, the naturalized phenomenologies also endorse the strong version of methodological naturalism. A weaker reading of methodological naturalism is possible if ontological naturalism is rejected.

3. Husserl's transcendental phenomenological critique of naturalism

Now that we have defined naturalism and examined the attempts to naturalize phenomenology, we can turn to the heart of the matter: Is transcendental phenomenology compatible with naturalism? If not, why not? Any attempt at a rapprochement between Husserl's transcendental phenomenology and the natural sciences should demonstrate that it can adequately address the epistemological, methodological, and ontological commitments of his transcendentalism. This section examines Husserl's position with respect to the varieties of naturalism defined above. I argue that Husserl rejects epistemological naturalism (both strong and weak variants), strong methodological naturalism, and ontological naturalism. I concern myself first with the epistemological variety.

3.1. Naturalism, epistemology, and eidetics

Husserl's transcendental phenomenological framework is at odds with epistemological naturalism for two main raisons. First, Husserl rejected epistemological naturalism because his transcendental project is a foundational epistemological (*erkenntnistheoretisch*) endeavor, concerning itself with the transcendental conditions of possibility of knowledge of objects "out there" in the world.[11] Transcendental

[11] As can be clearly seen from his 1907 lectures *Die Idee der Phänomenologie* (henceforth *Die Idee*), Husserl's "transcendental turn" is motivated by his desire to avoid the "epistemological

phenomenology attempts to clarify how it is that evidence can be attained in principle. Its aim is to provide an indubitable foundation for the all the sciences. As such, it cannot be a natural science, for otherwise it would find itself in a vicious circle of justification. If epistemological naturalism is defined as above, as the view that the only valid from of knowledge is empirical (and perhaps also formal) knowledge, and that by implication epistemology should concern itself with matters of fact and empirical knowledge (and possibly also with formal knowledge), then Husserl's transcendental phenomenology is incompatible with that view. This is because transcendentalism, on his account, is committed to the view that the very possibility of empirical knowledge, of knowledge about states of affairs in the world, requires a specific kind of justification, of a transcendental kind. Husserl argued that naturalist epistemologies cannot justify themselves using their own methods and specific form of knowledge without falling into a vicious circularity. Second, directly related to the first point, transcendental phenomenology conflicts with epistemological naturalism because it posits the validity of a non-empirical and non-formal domain of knowledge, knowledge of what Husserl called "material essences" or "*eidē*." He defined transcendental phenomenology as an eidetic descriptive science, a science interested in the "eidetic" or "essential" laws that pertain to the experience of various kinds of objects in virtue of their being specifically of that kind. Its function, with regard to the natural sciences, is to provide a clarification of the essential structures at work in their investigations. Let us unpack this.

Concerning the accusation of circularity, a cluster of theoretical perspectives Husserl called "positivism," "extreme empiricism," "psychologism," and "anthropologism" are variations on the position I have defined as epistemological naturalism. Husserl was

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(*erkenntnistheoretisch*) confusion" (*Die Idee*, 22) caused by naturalism with regard to the epistemological status and validity of knowledge, and to the ontological status of the kind of entities studied by the natural sciences. Husserl criticizes naturalist empiricism for similar reasons in *Ideen I*, §§18–26.

heavily involved in the *Psychologismusstreit*, the great debate over psychologism at the turn of the 20th century. Psychologism, the primary guise of epistemological naturalism when Husserl was writing *Logische Untersuchungen* circa 1900, is the view that epistemological justification—notably the laws of logic—depends on facts about the makeup of human psyches. Anthropologism, also prominent, was the related view that truth reduces to facts about human nature. A few illustrious proponents of psychologism and anthropologism were Lipps (1893), Wundt (1880/1883), and Sigwart (1904). Science, for a proponent of psychologism, is understood as a natural process, as something human psyches do. As indicated, this position has epistemological ramifications. As far as epistemology is concerned, for the proponent of psychologism, psychology as a natural science seems best suited to establish epistemological criteria, because scientific reasoning is a natural process that ought to be studied empirically. If the legitimacy and possibility of all forms of knowledge is ultimately grounded on psychological processes such as reasoning, remembering, and perceiving, then finding out how these processes function is necessary and sufficient to account for proper scientific methodology and justification. The same reasoning applies, *mutatis mutandis*, for anthropologism and facts about human nature.

Husserl was convinced that such enterprises were radically deficient bases from which to start a theory of knowledge, bound to fail because they were "naïve" and "self-contradictory" (*widersinnig*). Radical empiricism, as he argued in his *Logos* article "Philosophie als strenge Wissenschaft," jettisons epistemology: it replaces the establishment of epistemological ideals (e.g., the search for objective truth), and of methods and criteria for proper justification (such as defining exactly what is meant by the term "evidence") with the study of a natural process, namely scientific reasoning. Epistemological naturalism in its various guises (e.g., psychologism, anthropologism) aims to account for proper epistemological justification by discovering objective empirical facts about how humans understand the world. However, in so doing, these extreme empiricist positions presuppose their own norms and methods of justification.

Husserl argues that radical empiricism commits a vicious circle of reasoning; epistemological naturalism collapses into "a most radical countersense" when examined in its principles and how they are justified (*Ideen I*, 37; Husserl 1982, 38). For Husserl, the norms and canons of proper justification of scientific epistemology are not simply facts to be discovered by objective naturalistic methods. They must be established on a rigorous basis by a sound philosophical method of epistemological inquiry, as we shall see. Husserl thus rejected epistemological naturalism on the grounds that its justification of scientific knowledge, and of its own principles, was circular and self-contradictory.

Husserl also rejects epistemological naturalism because it fails to recognize the epistemological status of what Husserl called "material essences" and "laws of essence," as well as the correlative "eidetic" or "essential" universality and necessity. What is an essence?[12] The essence of a given thing consists in the essential traits that make that individual thing what it is; or, as Husserl put it, an essence is "the What (*sein Was*) of an individuum" (*Ideen I*, 10; Husserl 1982, 8). It was central to his transcendental project that one could provide an *a priori* analysis of the essences or essential properties that pertain to a given domain of objects in experience. Now, in perception, what is given to intuition are factual individual objects, which are always posited as existing in the world as a matter of fact, "as something factually existing spatiotemporally" (*Ideen I*, 8; Husserl 1982, 7). Husserl argued, however, that in lived experience, more is given than simply matters of fact. We also apprehend things perceived as being of this and that kind. And, he notes, nothing necessary to being that

[12] Space constraints forbid me to unfold all the implications of Husserl's theory of essences. I restrict my discussion of essences to the minimum required to show that Husserl rejected epistemological naturalism on the basis of the validity of material eidetic investigations. For Husserl's account of essential laws and how they relate to his doctrine of dependence and foundation, see *III. Logische Untersuchung*, esp. §§10–17. For the distinction between analytic (or formal) and synthetic (or material) *a priori* laws, see §§11–12 of that work. For essences and essential laws generally, and their relation to Husserl's doctrine of regional ontology, see the first chapter of *Ideen I* (§§1–17). For formalizations of eidetic necessity, as well as dependence and foundation relations among essences, and also between essences and individual things, see, e.g., Correia 2004; Fine 1995.

particular kind of object is bound up with the posited existence of a thing in perception. Any object perceived as being in a given place at a given time could have existed in another place or at another time and remain essentially an object of the same kind. It might even be fictional or imagined, yet still is what it is; a fictive sunset is still a sunset, and an imagined person is still a person. In other words, the factual existence of any object is contingent to its being that object.

To this contingency or "factualness" of the spatiotemporal existence of a thing, argued Husserl, there pertains a correlative necessity. This is eidetic necessity, which characterizes the essentially necessary properties of a thing in virtue of its being that kind of thing.[13] Husserl argued that contingent matters of fact are always bound up with essences, and these essences prescribe necessary conditions on the matters of fact subsumed under them (*Ideen I*, §2). These necessary conditions are "eidetic laws" or "laws of essence." Eidetic laws are such that if an entity falls under this or that essence, then such and such properties, prescribed by the essence of that entity, will necessarily be predicable of that entity as a matter of eidetic law. Any individual object, beyond its being an individual object (as a "This here"), can be qualified, as Husserl puts it, as being "'*in itself*' thus and so," that is, as having "its *own specific character*, its stock of *essential* predicables which must belong to it (as 'an existent such as it is in itself') if other, secondary determinations can belong to it" (*Ideen I*, 9; Husserl 1982, 7). There are two main uses of *eidē* (*Ideen I*, §§5–6). We can take essences as the objects of our judgment, and go about relating essences to other essences using eidetic laws—what Fine (1995) has called "species foundation"—and we can also use essences to formulate judgments about the particulars that are subsumed under those essences, in

[13] Husserl uses the term "necessity" to characterize both specifications of general laws (for example in *III. Logische Untersuchung*, §12) and also to characterize the kind of necessity attached to these laws (for instance in *Ideen I*, §2, where eidetic necessity and correlative eidetic universality are opposed to the contingency or "factualness" of matters of fact). For clarity, I shall use the terms "eidetic necessity" or "essential necessity" as a modal qualification (necessarily true in virtue of what it is to be an *A*, where *A* is an essence), and reserve the term "eidetic law" both for generalized and specified forms of eidetic laws.

the mode of universal quantification.[14] Eidetic necessity is thus the kind of necessity that pertains to those properties which are necessarily predicable to any possible entity subsumed under a given essence in virtue of that subsumption. Eidetic laws and their correlative necessity, Husserl insists, are completely independent of the factual existence of the thing subsumed, and *a fortiori* of any natural nomological laws that attach to the entity in the course of natural experience (*Ideen I*, §4).

As indicated, eidetic descriptions can be employed to characterize the relations of essential necessity among essences, and also to make predicative judgments about the essential properties had by given individual, factually existing things in virtue of their subsumption under this or that essence. "Eidetic universality" pertains to the state of affairs that we can formulate universally quantified statements applying with eidetic necessity to all things subsumed under a given essence. In *III. Logische Untersuchung*, Husserl relates the notions of eidetic law and necessity to his theory of parts and wholes, and specifically to his notion of "foundation" (defined in §14 of that work). This notion provides him with the template for all eidetic laws. Husserl tells us that, given a more comprehensive whole or unity subsumed under a given essence, it is an essential law that some parts of that unity stand in a relation of dependence with regard to other parts, whereas others do not. Those dependent parts or "moments" that essentially require the existence of other parts are "founded" on the latter; the essences that pertain to those parts stand in a similar foundation relation at the level of essences. Founded essences require "supplementation" from the essences on which they are founded. Consider, for instance, the unity VISUAL DATUM. Husserl argues that it is an eidetic law that, given a unity subsumed under the essence VISUAL DATUM (e.g, the experience of this red expanse here in my visual field), the moment of that unity subsumed under the *eidos* COLOR QUALITY (in this case, RED), which is a

[14] As Husserl puts it, we can "judge in the mode Any [*Überhaupt*] about the individual, though purely as a single particular subsumed under essences" (*Ideen I*, 14; Husserl 1982, 12). We can readily equate this judging in the "mode Any" to universal quantification.

dependent part of the comprehensive whole subsumed under the essence VISUAL DATUM, needs to be "supplemented" by another moment subsumed under the essence EXTENSION. This kind of relation is what is meant by foundation: if an essence *A* is founded on another *M*, then necessarily in virtue of what it is to be instantiations of the essences involved, any instantiation *x* of *A* needs to be "supplemented" by an instantiation *y* of *M* in the context of a more comprehensive unity which contains *x* and *y* as moments. Eidetic laws such as this one obtain with eidetic necessity for any visual datum in virtue if what it is to be subsumed under the essences involved; in the case just cited, in virtue of what it is to be a VISUAL DATUM, a COLOR and an EXTENSION.

This is the task of an eidetic science: to determine eidetic laws that apply between essences, and between essences and individuals subsumed under those essences. Husserl sharply distinguished sciences of matters of fact (factual sciences) and eidetic sciences. Whereas factual sciences, such as the natural sciences, are interested in the factual causal connections between things in experience, eidetic sciences deal with the necessary traits that always pertain to the experience of this and that kind of object (*Ideen I*, §§7–8 *Ideen III*, §7).[15] Husserl, moreover, thought that the relation between eidetic sciences and sciences of fact was unilateral. Eidetic sciences are independent from factual sciences, and only deal with individual factual things insofar as they instantiate given eidetic laws (*Ideen I*, §8; *Ideen III*, §§7–8). Mathematics and logic, for instance, which Husserl regarded as eidetic sciences, deal purely with formal essences and formal eidetic laws. When factually existing things enter into their

[15] The independence of eidetic universality and necessity with regard to matters of fact justifies the central role of imagination in eidetic investigations (*Ideen I*, §4). As indicated, I can imagine an object with no pretensions to its actual existence, but despite this lack of factual positing, the very same eidetic laws still pertain to it as would if it really existed. An object perceived and one imagined, if they are subsumed under the same *eidos*, necessarily share the same essential properties. I can, for instance, imagine a physical object that does not exist. Although, insofar as it is merely imagined (rather than perceived), the imagined object does not exist in fact, spatiotemporally, it still has all the essential qualities that make it the kind of object it is.

account, as when the geometer draws a triangle on the blackboard, they serve as illustrations of eidetic laws that pertain to a given class of objects subsumed under an essence. Sciences of fact, on the other hand, always presuppose an *a priori* clarification of the eidetic structures that pertain to their domain of objects, or what Husserl called a "regional ontology."[16] The natural sciences proceed to discover contingent, empirical truths, whose validity requires an *a priori* investigation into the absolutely necessary truths uncovered by the eidetic descriptive clarification of the ontological regions explored by the natural sciences (*Ideen III*, 47–48). Yoshimi (2010, 29) has remarked that this role is similar to the division of labor between contemporary philosophy of science and the natural sciences. The factual sciences deal with the possibilities left opened by transcendental phenomenological eidetic description.

The epistemological task of eidetic analysis in general is to provide a clarification of the eidetic necessary laws that pertain to a given domain of objects. The specific eidetic task of transcendental phenomenology with regard to the sciences of matters of fact is to provide "material *a priori*" eidetic laws, laws which pertain *a priori* to the content of the essences involved (rather than laws related to formal essences). Transcendental phenomenology is a descriptive eidetic theory that pertains to the essences of pure lived experience; and the laws and essences involved in the description of pure lived experience are "material" ones (*Ideen I*, §75). What is the distinction? Formal *a priori* laws, as Husserl writes in *III. Logische Untersuchung* (§§11–12), are those that pertain to formal or exact essences. Such laws can have all their terms replaced by variables without changing the law; the essences in such laws are "exact essences" that can be formalized. Material *a priori* laws are those eidetic laws that cannot have their terms substituted in this way, because the terms in such laws depend on other essences to

[16] For Husserl's discussion of regional ontology, see *Ideen I*, §§9–10. For an illustration of how eidetic analysis can clarify an ontological region prior to naturalistic investigations, see Husserl's discussion of "rational psychology" in *Ideen III*, §§6–8. Rational psychology elucidates the eidetic laws that pertain the domain of mental realities, and thus prescribed the possible configurations of meaning in experience. The factual sciences then proceed to fill in what possibilities eidetic analysis has left open.

which they stand in a relation of dependence or foundation. "A whole cannot exist without its parts" is an analytic law; "A color cannot exist without an extension that it covers" is a synthetic or material *a priori* law (§11). Again, transcendental phenomenology, strictly speaking, is interested in the latter kind of essence, and these essences cannot be formalized (see *Ideen I*, §§72–74). Against those weak epistemological naturalists who would explicate all forms of valid knowledge in terms of empirical and formal kinds of knowledge, Husserl is clearly arguing that there exists another kind of knowledge, eidetic knowledge of material *a priori* laws and their correlative necessity, which is irreducible to either kind (see Romano 2010 for a discussion of eidetic necessity versus the nomological and formal kinds of necessity).

Essences are a new kind of object, and their study opens onto a new domain of knowledge disjoint from empirical knowledge. *Contra* strong epistemological naturalists, who deny the legitimacy of non-empirical kinds of knowledge claims, Husserl claims that there is an entire domain of valid laws (universally and necessarily valid, at that) that pertain to *eidē*. The claims of the natural science, and the possibility in principle of empirical knowledge, rests on an *a priori* clarification of the regional ontologies in which these sciences operate. Husserl thus rejected the epistemological naturalist view according to which all valid forms of knowledge amount to empirical knowledge. On the contrary, Husserl argued not only that was there another domain of legitimate knowledge of the material eidetic kind, but also that this kind of knowledge clarified and ultimately grounded the possibility of meaningful empirical claims. Husserl also rejects the weak epistemological naturalist claim that knowledge reduces either to empirical or formal knowledge. Material *a priori* laws and essences are different in kind from formal or analytic ones. Such considerations show that the project to epistemologically naturalize phenomenology (e.g., the project of a morphological eidetics) are, at least from the transcendental point of view, are bound to fail. In summary, then, the issues Husserl raises against epistemological naturalist positions is that they conflate the role of epistemology and that of natural science, and

do not recognize the non-natural status of essences. Having shown why Husserl rejected epistemological naturalism, I now turn to his critique of methodological naturalism.

3.2. A method with attitude, and the problem of constitution

Husserl's epistemological commitments had methodological implications, and he argued against what I have defined above as strong methodological naturalism. Recall that strong methodological naturalism is the meta-philosophical view that philosophy should employ only those methods found in the natural sciences. Husserl rejected this view, and defended the autonomy of philosophy. He argued that any claim to knowledge, if it is to be justified and meaningful, must first be grounded in epistemological evidence and eidetically clarified. As indicated, it was his view that this *a priori* grounding and clarification cannot be provided by the natural sciences themselves without vicious circularity. For this reason, transcendental phenomenology required a method specific to it, a principled way of approaching things and states of affairs, in order to justify our making knowledge claims about them in a way that allows for systematic evidence, and to clarify the eidetic structures necessarily implied in such claims. It could not dispense with a philosophical method that preserved its autonomy relative to the natural sciences. This method consists in different kinds of "reductions," or variations in our rapport to our lived experience, which open onto the specific attitudes of transcendental phenomenology.

As is well known to all phenomenologists, for Husserl, everyday life is of course played out within the "natural attitude." This is the attitude of our everyday commerce with the world and with other people. It is characterized by a "general positing" (*Ideen I*, §30) of the things that surround us, that is, a taking for granted of the existence of

objects. These objects are immediately taken to exist objectively, as "out there" in the world, independently of subjects. The "correlate" of the natural attitude (i.e., the entity that corresponds in experience to the activity of the subject in this attitude) is the "natural world" given to us in everyday experience.

The natural sciences proceed in continuity with the natural attitude of everyday life. Scientific activities and investigations take already given objects as their starting point. However, natural scientific activity goes further in this direction than our everyday natural attitude. The specific attitude of the natural sciences hypostatizes the natural world, making it into an entity existing in itself in complete autonomy from any subject: "nature." In scientific activity, Husserl argued, the natural attitude becomes a self-contained theoretical stance: the "naturalistic attitude." The latter attitude is that in which things that appear in intuition are treated as objects of nature, as part of the causal nexus of natural things. To adopt such an attitude entails that one correlatively adopt the methods of the natural sciences in order to account for the objects of our investigations. In the naturalistic attitude, conscious subjects are treated as psychological objects that can be studied using the methods of natural science (see e.g., *Ideen II*, §49). Methodological naturalism, then, stems directly from the adoption of the naturalistic attitude.

As indicated, Husserl opposes strong methodological naturalism, arguing that philosophy ought to have its own rigorous method: the phenomenological reductions. The first, and perhaps the most central, of the reductions is the "transcendental reduction" or "*epochē*," which opens onto the specific "transcendental attitude." The second of the reductions, which allows for the direct intuition of essences, is the "eidetic reduction" and correlative "eidetic attitude." Both reductions consist in a change in attitude toward lived experience, and represent the specific methodological contribution of transcendental phenomenology.

The first reduction, the *epochē*, is a methodological suspension of belief with regard to the existence of whatever phenomena are being considered in our phenomenological investigations.[17] The point of using the *epochē* is to show how knowledge about "transcendent" entities (that exist "out there" in the world) is possible in principle. Transcendental phenomenologists argue that knowledge claims must be grounded in what Husserl called "evidence."[18] Evidence is arrived at, following the "principle of principles," by the use of intuition (*Ideen I*, §24). Intuition of an entity is the apprehension of the bodily presence (*Leibhaftigkeit*) of that entity "in the flesh" or again "in person" (*leibhaft*), as directly experienced in consciousness. The *epochē* is the method that allows for this systematic intuition of evidence, of the givenness in the flesh (*leibhaftige Gegebenheit*) of things in experience.

The *epochē* is what allows Husserl to respond methodologically to the first shortcoming of epistemological naturalism, its circular justification. In order to show how immanent mental states can be about something in the world, the transcendental phenomenologist "brackets" the existence of the things in his lived experience. By employing the *epochē*, phenomenologists start their description of lived experience from its immediacy, moving from there to the "transcendent" things that appear in its flux. The existence of transcendent objects, about which we claim to know this or that, is thus no longer taken for granted, but becomes that which must be accounted for. Transcendent objects, however, are not lost in the reduction. Rather, they reappear with a "change of sign," now grounded in the immediacy of lived experience and made

[17] A more fine-grained analysis of the *epochē* would reveal that this reduction is actually a family of related reductions, which reduce to different levels of pure lived experience. Space constraints forbid me from unfolding these distinctions in a systematic way. For a recent and in-depth analysis of the development of the *epochē* in Husserl's thought, see Smith (2010), chapters 2 and 3.

[18] "Evidence" for Husserl is not equivalent to observational evidence in contemporary philosophy of science, i.e. as methodologically justified data corroborating various claims and theories (as in, e.g., Bechtel forthcoming). By "epistemological evidence," I mean specifically Husserl's notion of evidence as being given "in person" or "in the flesh" to consciousness. For the phenomenological conception of evidence, see Heffernan (1998); also see Sokolowski (1964), 153ff.

evident thereby. Speaking of the bracketing of reality in the *epochē*, Husserl writes: "Strictly speaking, we have not lost anything but rather have gained the whole of absolute being which, rightly understood, contains within itself, 'constitutes' within itself, all worldly transcendencies" (*Ideen I*, 94; Husserl 1982, 113). Using the *epochē*, the transcendental phenomenologist reduces his lived experience to its immediacy. Transcendent objects reappear, in the immanent flux of lived experience, but with a "change of sign," now apprehended as "constituted."

What does Husserl mean by "constitution"?[19] The constitution of objects in lived experience refers to the way objects in their meaningfulness (*Seinsinn*) are disclosed in the ongoing endogenous flow of consciousness. Thus, objects are no longer taken as existing independently of consciousness, but are apprehended precisely as they exist in their meaningfulness to consciousness, as a meaningful unfolding of experience. Constitution, understood transcendentally, is thus the disclosure of meaningful objects in the life of the mind (*Seele*). The expression "in," of course, must not be taken literally in the spatial sense. The mind, Husserl argued, is not spatially extended, and *a fortiori* what "unfolds in" the mind is not a spatial event (although it is temporal; *Ideen II*, §32). Constitution, considered transcendentally, is not an empirically real process (although, as I argue later in this chapter, it is related to empirically real processes). Rather, it is the coming into lived experience of things for the subject. A theory of constitution, the likes of which Husserl elaborated throughout his career (see Sokolwoski 1964), is a

[19] This question is perhaps the most fundamental of Husserl's transcendental phenomenology, and I can only hope to sketch an answer here. As Sokolowski, whose work on constitution remains of interest today, remarks, "There is no other concept that reflects in itself the totality of his thought so completely and so well. The philosophical value of his theory of constitution is the philosophical value of phenomenology as a whole, and the weakness and difficulty attached to this concept are the weakness and difficulty inherent in phenomenology as a philosophical method" (1964, 223). It is generally recognized that Husserl's theory of constitution moves from the "static" conception of constitution in his earlier works (i.e. the schema of intentions animating content in *Logische Untersuchungen* and *Ideen I*) to the "genetic" conception in his later works (especially *Formale und transzendentale Logik*, the *Cartesianische Meditationen*, and *Erfahrung und Urteil*). For a contemporary study of the notion of constitution in Husserl's overall philosophical project, see Sandmeyer (2009).

material eidetic theory (as defined above) that shows how it is possible in principle that meaningful objects come to disclosure in conscious experience, and become present "in the flesh."

Constitution and its elucidation by the method of transcendental reduction are what allow Husserl to justify the epistemological scope of transcendental phenomenology. Studying the epistemic function of consciousness, as that in virtue of which things are constituted or disclosed in experience as meaningful, provides Husserl with an epistemological ground for all predicative knowledge. This is because, in disclosing the region of immediate pure lived experience, the *epochē* allows the phenomenologist to trace the genesis of constituted predicative meaning to the pre-predicative encounter, itself already meaningful, from which it originates. For Husserl, especially in his later "genetic phenomenological" period, meaning has a history; as he writes in *Formale und transzendentale Logik*, any meaningful predicative claim of the form "*S* is *p*" ultimately results from the dialectical relation between the agent's history of "sedimented" predicative judgments and her pre-predicative meaningful encounter with things in the world. Phenomenology is thus a transcendental epistemological inquiry and can function as a foundational epistemology because it can show how "transcendence in immanence," that is, the constitution of transcendent meaningful objects within the dynamics of immanent lived experience, is possible. This is precisely what the methodological naturalist is incapable of doing: her method always presupposes that her ability to make claims about the world has been already established and justified.

The second reduction employed by Husserl is the "eidetic reduction," and correlative mode of seeing, the "seeing of essences" (*Wesensschau*). The seeing of essences allows one to directly see the essential structures at work in experience. Similarly to the transcendental reduction, the eidetic reduction brackets the existence of the transcendent objects that are intuited in experience. Rather than examining the

constitution of meaningful objects in the flux of lived experience, as in the *epochē*, the phenomenologist whose experience has undergone the eidetic reduction apprehends the essences of the objects that he experiences. The eidetic reduction is what allows Husserl to justify methodologically the fact that one can access the essential structures present in pure lived experience. Husserl writes: "The essence (Eidos) is a new sort of object. Just as the datum of individual or experiencing intuition is an individual object, so the datum of eidetic intuition is a pure essence" (*Ideen I*, 10–11; Husserl 1982, 9). The eidetic way of seeing and the eidetic attitude allow Husserl to support his claim that there exists a valid domain of knowledge disjoint from empirical knowledge, because it provides a rigorous method by which to grasp the *eidē* present in any lived experience. The transcendental significance of phenomenology, the possibility of its playing the role of a "first philosophy," apt to ultimately ground all others, rests on the eidetic status of its investigations (see *Cartesianische Meditationen*, §34). Husserl defined transcendental phenomenology as an eidetic science aiming to describe "pure" (reduced) mental processes (*Ideen I*, §75). The method of eidetic seeing allows the transcendental phenomenologist to attain eidetic universality and necessity, a truly apodictic *fundamentum inconcussum*.

Like the *epochē*, the *Wesensschau* consists in a change in attitude with regard to our immediate lived experience. One can always go from the experience of a factual encounter with an object to a direct intuition of the essences involved in that experience through the eidetic reduction. In fact, it is an eidetic possibility inherent in all lived experience that one can adopt the eidetic attitude with regard to it. Husserl writes, "Experiencing, or *intuition of something individual* can become transmuted into *eidetic seeing* (*ideation*)—a possibility which is itself to be understood not as empirical, but as eidetic. What is seen when that occurs is the corresponding *pure* essence, or Eidos, whether it be the highest category or a particularization thereof—down to full concretion" (*Ideen I*, 10; Husserl 1982, 8). Thus, just as the *epochē* elucidates the constituted character of all things experienced, latent in the natural attitude of ordinary

everyday experience, the eidetic reduction elucidates the essential structures present in all things experienced, also latent in the natural attitude.

"Naturalized phenomenologies" can be seen as combining epistemological and methodological naturalism; they attempt to use the descriptions provided by phenomenology in the framework of ordinary natural scientific explanation. The reductions are not employed because of their philosophical significance (as providing a methodological justification for the autonomy of philosophical epistemological inquiry), but rather as one tool among others available to the naturalist in his attempt to explain the natural phenomenon of consciousness. Phenomenological description is used, in such approaches, to the extent that it can be recuperated as a rigorous description of an actually existing thing, consciousness, without regard for the epistemological justificatory value of these analyses, nor for the specific kind of necessity uncovered by eidetic analysis. Husserl would clearly object to the claim that in so instrumentalizing eidetic analysis, one has effectively naturalized phenomenology.

Bayne (2004) has argued that neurophenomenology, notably as exemplified by the accounts of Lutz (2002) and Lutz & Thompson (2003), really amounts to a disciplined use of first-person data in cognitive scientific modeling, albeit in a new form that involves interesting new elements, such as, e.g., the elaboration of categories with the participants themselves, and the training of the latter through increased exposure time to the kinds of stimuli tested. However, he argues, nothing particularly phenomenological distinguishes this methodology from, say, the kind of first-person data use already in vogue in, e.g., qualitative analysis. And indeed, it is far from clear that the use of "eidetics" in neurophenomenology is much more than a phenomenological gloss for a sophisticated type of introspection, albeit inspired by phenomenological insights. This perspective is echoed by Overgaard (2004, 377–378),

who argues that it is difficult to distinguish the practice of neurophenomenology from traditional forms of introspection and first-person data use.

In summary, that Husserl rejected strong methodological naturalism is evident from his proposing distinct philosophical methods, the reductions, irreducible to the methods of the natural sciences. The specific methodology of transcendental phenomenology thus consists in different changes in attitude with regard to lived experience. The purpose of these reductions is, one the one hand, to justify the possibility of knowledge claims about transcendent objects and to show their presence in consciousness as constituted and meaningful and, on the other hand, to elucidate the eidetic necessary conditions on the experience of any possible object. Husserl's epistemological and methodological commitments have important ontological ramifications, and I now turn to these.

3.3. Ontological naturalism and consciousness

Husserl also rejected ontological naturalism. This was a later development of his thought.[20] To clarify his reasoning, I propose to consider a phenomenological distinction between two ways of understanding consciousness. This will allow me to clearly frame Husserl's critique of ontological naturalism (which is, recall, the view that all things and properties are natural things and properties). On the one hand, consciousness can be understood as a natural process or object, as a factual individually existing thing that can be studied with naturalistic methodologies. I shall henceforth call this view of consciousness '*Cn*', for short. Consciousness is approached by the

[20] As Moran (2008) notes, Husserl's position on naturalism has a complex historical development. Husserl's critique of naturalism moves from a more methodological orientation in his early career, focusing especially on the naturalization of ideality and normativity, to a more ontological direction in his later career. This shift to ontological arguments is especially marked in in Husserl's *Formale und transzendentale Logik*, *Ideen II*, and *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie* (hereafter *Krisis*).

natural scientist, argued Husserl, as an empirical phenomenon, such as plate tectonics, the solar system, E. coli, ecosystems, etc., but of perhaps greater complexity. The attempt to naturalize consciousness thus amounts to giving a scientific naturalistic account of consciousness, conceptualized as a natural process (that is, as *Cn*).

For the transcendental phenomenologist, however, consciousness is not merely an object or process to be explained using the methods of natural science. Husserl argued that consciousness cannot be understood merely as an object of knowledge, but also as the knowing subject for whom there can be any object. The core ontological objection raised by Husserl against naturalism is that it "objectifies" (that is, treats as factual, spatiotemporal objects) certain things that he argued simply cannot be accounted for in real, objective terms. Against ontological naturalism, Husserl proposed that we think of consciousness "transcendentally"; that is, in its epistemic dimension, as the condition of possibility of there being knowledge of anything. I shall denote this second understanding of consciousness, as transcendental condition of possibility of knowledge, by '*Ce*'. What is at stake here, as Zahavi points out, is nothing less than the difference between "being aware of oneself as a causally determined known object, as a part of the empirical world, and being aware of oneself as a knowing subject, as—to paraphrase Wittgenstein—the limit of the world" (2004b, 335). Rather than understanding consciousness as merely a psychological phenomenon, Husserl is proposing to understand it as an epistemic precondition of, and constant presupposition of, the appearance of phenomena in general.

If *Ce* is not an object, what is it? It is certainly not a factually existing entity, because it is the absolute condition of possibility of the constitution of any thing in lived experience. So what, then, is it? Consciousness and its ego, when viewed transcendentally, are *eidē*. They are the invariant, necessary structures of the unfolding of any possible lived experience (*Ideen I*, §§81–83, esp. §83; *Cartesianische Meditationen*, §§34–37). Thus, for instance, inner time consciousness is not merely that

fact that this or that empirical consciousness flows temporally; it is an essential structure or eidetic *concretum*, whose unity provides a lawfulness that pertains with eidetic necessity to all lived experiences. Phenomenological time consciousness, as Husserl describes it, "not only designates something universally belonging to every single mental process, but also a *necessary form combining mental processes with mental processes*" (*Ideen I*, 163; Husserl 1982, 194). It is thus a material eidetic law that any lived experience, any concrete mental process, requires supplementation from the flux which ties each together with the whole stream of lived experiences. As such, *Ce* simply cannot be accounted for in the natural scientific register; recall that matters of fact and matters essential are disjoint. Insofar as it is an eidetic universal structure with its own eidetic necessary laws, *Ce* can only be described in the material eidetic register, by employing the eidetic reduction and the phenomenological description of the *eidē* seen thereupon. When Husserl is analyzing the structure of conscious experience, as he does in *Zur Phänomenologie des inneren Zeitbewusstseins*,[21] he is not describing a natural spatiotemporal process. He is rather describing necessary essential structures of any possible lived experience, the ultimate *a priori* laws of time and its essential traits. Husserl writes:

> *The epistemological question about the possibility of experience is the question about the essence of experience*; and the clarification of its phenomenological possibility requires going back to the phenomenological data, for what is experienced consists, phenomenologically, of such data. [...] We seek to bring the *a priori of time* to *clarity* by exploring the *consciousness of time*, by bringing its essential constitution to light, and by exhibiting the apprehension-contents and act-characters that pertain—perhaps specifically—to time and to which the *a priori* temporal laws essentially belong. (*Zeitbewusstseins*, 8–9, 10; Husserl 1991b, 9, 10).

[21] Hereafter, cited as *Zeitbewusstseins*.

It thus follows that any attempt to model consciousness as a factual event in the world will miss its crucial transcendental signification. This remark also clarifies the meaning of constitution. Transcendental phenomenology must study the constitution of objects and their disclosure in the flux of pure experience using the eidetic method that reveals the material *a priori* essential laws pertaining to constitution. The invariant *eidē* of the flux of inner time are such invariant essential structures.

On Husserl's argument, naturalistic accounts of consciousness will remain incomplete so long as they neglect its epistemic dimension and eidetic clarification. For the transcendental phenomenologist, a full account of consciousness is only possible if it is understood both in its factual existence, as *Cn*, and in its fundamental essential structures, as *Ce*. Transcendental phenomenologists are not rejecting the idea that consciousness is, in part, a phenomenon of nature (they accept that *Cn* is a valid object of investigation); they are rather emphasizing that it is not only such an object, and especially not when examined in its epistemological function, as the essential invariant structure of any possible experience. Such an empirical dimension certainly is a valid domain of experience, but does not interest transcendental phenomenology *per se*. Husserl writes:

> The psychological apperception that takes experiences to be psychic states of empirical persons, of *psychophysical subjects*; that establishes connections, whether purely psychic or psychophysical, among these experiences; and that follows the becoming, the taking shape, and the being-reshaped of psychic experiences *according to natural laws*—this psychological apperception is entirely different from the *phenomenological* apperception. (*Zeitbewusstseins*, 9; Husserl 1991b, 9)

Hence, beyond its dimension as a psychological phenomenon to be studied by employing the empirical methods of naturalistic psychology, transcendental

phenomenology studies consciousness as the universal eidetic structure that acts as the true foundation of all epistemological claims.

Husserl's non-psychological treatment of consciousness is clearly at odds with naturalism as he understood it. The great methodological naivety of naturalism is, he argued, that it presupposes the objectivity of the objects it investigates (i.e., their constitution, as they "give themselves" in lived experience). The danger in the objectivist presupposition is that those who endorse it might argue that consciousness is exhaustively accounted for with a set of facts about natural processes. Husserl wholeheartedly disagreed with this approach as missing the most important dimension of consciousness, whose investigation as transcendental condition of possibility for knowledge is (for principled reasons) prior to, and separate from, the study of any thing or state of affairs that can be made evident in conscious experience. It is prior to any natural science because it is only in virtue of *Ce* that any claim to knowledge can ultimately be justified, and it is separate from the study of any natural process because it is not interested in matters of fact, focused as it is instead on eidetic laws and eidetic necessity.

For Husserl, if naturalizing consciousness amounts to giving a naturalistic explanatory account of it as an empirical object of study, then consciousness can never be fully naturalized, because *Ce* is not a natural object; it is rather the necessary eidetic structure of the experience of a subject for whom natural objects are at all. Husserl thus clearly rejects ontological naturalism because there are some things which are not natural objects with natural properties. *Ce*, as a pure *eidos*, is such a thing. To propose, as do those who would naturalize time consciousness, that *Ce* could be accounted for with natural nomological laws seems to miss Husserl's ontological distinction between the consciousness of a psycho-physical subject, as a natural event, and pure consciousness as an *eidos*. Moreover, to endorse ontological naturalism *eo ipso* collapses the distinction between weak and strong methodological naturalism; if all things and

properties, even time consciousness, are natural things and properties, then no leg room remains for the weaker position. Those who endorse ontological naturalism are thus, by that very fact, committed to strong methodological naturalism, which Husserl rejected.

Many commentators (e.g., Zahavi 2004b; 2010; 2013; Moran 2013; Brown 2008; Clegg 2006; Overgaard 2004) have invited us to heed the claim that phenomenology could be naturalized with caution. They have pointed out that Husserl's overarching philosophical project and its transcendental philosophical commitments are what motivate—and ultimately justify—the specific remarks he made about the natural sciences and mathematics. To address only the latter while neglecting the former would deform his philosophical enterprise. I am sympathetic to these arguments. I take the project to integrate phenomenology into the natural sciences to be an indispensable and theoretically interesting extension of the latter's methodologies, and for reasons that those who would naturalize phenomenology make abundantly clear: if cognitive science is to be a science of the *mind*, then one needs to account for the first-person phenomenal perspective. Cognitive science cannot just describe what is happening in the 'black box'; it must describe what it is like "*for* the black box" (Petitot et al. 1999a, 12). However, accounting for what it is like for the black box is not the same as accounting for what it is like for the black box to know about the world, nor is it the same as describing the eidetic invariants of its experience.

In trying to deal with the epistemological and foundationalist ambitions of phenomenology, current naturalistic approaches jettison the transcendental, epistemic dimension of consciousness outright. In so doing, however, much of the philosophical import of phenomenology is bracketed, and may even be impossible to recover. This casting aside of *Ce* and its epistemological ramifications throws doubt on these projects achieving their desideratum, i.e. to naturalize *phenomenology* as an eidetic discipline of transcendental inquiry. They do not leave the natural attitude and view

consciousness as a psychological thing in need of cognitive scientific explanation. They are less concerned with the epistemological, methodological, and ontological implications of transcendental phenomenology than they are with integrating, in different ways (through DST, operationalization or direct formalization), the sundry insights of phenomenological analysis (such as dynamical coping, dynamics of time consciousness, embodiment, etc.) with various kinds of data sets and formal explanatory models in cognitive neuroscience. Although their emphasis on, e.g., the endogenous dynamics of consciousness, first-person data, etc., draws from phenomenological thought, consciousness is not considered transcendentally, from an epistemic vantage point, and is never described in eidetic terms for reasons other than using this description to further naturalistic explanatory projects.[22]

[22] It has been argued by Gallagher (2012), Zahavi (2004b; 2010; 2013), and others that these naturalization projects are not naturalizations of transcendental phenomenology, but are better understood (in the best of cases) precisely as forms of what Husserl called "phenomenological psychology." I agree with this assessment. Indeed, as discussed above, transcendental phenomenology engages consciousness not only as an empirical psychological phenomena (*Cn*), but as the eidetic necessary structure that acts as the epistemic condition of possibility of the knowledge of anything (as *Ce*). There is thus a significant disconnect between the naturalistic approaches to phenomenology, which endorse forms of naturalism Husserl rejected, and the transcendental philosophical aims of phenomenology. This is not to say, however, that phenomenology and psychology are completely unrelated. Husserl himself had glimpsed the usefulness of such naturalistic uses of phenomenological description. He had seen that phenomenology and psychology were intimately linked, and had allowed for the possibility of a natural scientific "counterpart" to phenomenology, a naturalistic or mathematized use of the results of phenomenological description in the natural sciences. Alongside transcendental phenomenology, a "phenomenological psychology" could thus be envisioned. The main difference between the two is that while the former is an epistemological investigation carried out in the eidetic and transcendental attitudes, the latter is an natural science carried out in the natural attitude, albeit one informed by phenomenological eidetic analyses. In short, phenomenological psychology is not interested in the epistemic dimension of consciousness (*Ce*), but rather in consciousness as a natural process (*Cn*). It employs phenomenological eidetic analysis to determine with precision the object to be analyzed naturalistically thereafter, but it does so within the natural attitude. See volume IX of *Husserliana*, entitled *Phänomenologische Psychologie. Vorlesungen Sommersemester 1925*.

4. Weak methodological naturalism and transcendental phenomenology

It would seem that transcendental phenomenology is incompatible with naturalism in the three senses examined above. The attempts to naturalize phenomenology seem to be committed to varieties of naturalism fundamentally at odds with the main commitments of transcendentalism. At this point, it may be interesting to recall that a weaker form of methodological naturalism is conceptually viable: the conditional form. As indicated, such a weaker reading would take the form of a conditional constraint: *if* *X* is a natural entity or property, *then* the most adequate method for its study is one coherent or continuous with those of the natural sciences. We should recall that this conditional reading of methodological naturalism is only available to the naturalist as a theoretical position to the extent that she reject ontological naturalism, lest the antecedent always trivially obtain. Indeed, if ontological naturalism is accepted as premise, then it follows that all things and properties simply are natural things and properties, and in that case no room would remain for the weaker statement of the position.

I argue that Husserl's transcendental project is fully compatible with this softer form of methodological naturalism. Husserl can even be said to endorse weak methodological naturalism about the lived body and the mind, because he regarded them as natural things with natural properties, as part of the ontological region "nature," and argued that at least some natural sciences were suited to their study. He even proposed a specific science, called "somatology," that was apt to study the lived body and its crucial role in constitution.

4.1. The mind and the lived body as objects of nature

In *Ideen II* and *III*, Husserl arguably endorsed weak methodological naturalism with respect to the lived body (*Leib*) and the mind (*Seele*).[23] He argued that insofar as the lived body and the mind were legitimately considered as natural entities, they could be studied using the methods of the natural sciences. Husserl argued that the ontological correlate of naturalistic attitude was the ontological region called "nature." What we call nature, then, is the domain of possible objects correlated to that attitude, and objects given in this attitude are *ipso facto* natural objects (*Ideen II*, §§1–2, §12; *Ideen III*, §§1–2) Natural objects, insofar as they are part of the ontological region nature, are essentially part of the nexus of causal interactions.

Both the mind and the lived body are given in the naturalistic attitude. The lived body is apprehended in that attitude as one of the main regions of reality (*Ideen III*, §§1–2). Although not equivalent to material physical nature, and not given in the same way, the lived body is part of nature "in a second, broadened sense," that of "animal nature" (*Ideen II*, 28; Husserl 1989, 30). The mind is also, as Husserl puts it, "in its connection with the material [lived body], an Object of natural-scientific research" (*Ideen II*, 90; Husserl 1989, 96). Both mind and lived body are thus legitimately understood as natural objects. Although Husserl was not endorsing a metaphysical thesis about these entities (i.e., the lived body and the mind are not characterized by the metaphysical status "natural," as in ontological naturalism), to treat them as natural things with

[23] I preserve for the most part the terminology proposed in the translation of *Ideen II* by Rojcewicz and Schuwer (Husserl 1989). However, I opt to translate "*Seele*" as "mind" (rather than as "soul") and "*seelische*" as "mental." Husserl, when discussing the *Seele*, had in mind that which is studied by psychologists; I employ the more contemporary terminology to stay closer to recent sciences of the mind and avoid the pitfalls associated to doctrines of the soul. I also use "lived body" to translate "*Leib*," rather than the uppercase "Body," to avoid possible ambiguities. English citations of *Ideen II* employ the translation by Rojcewicz and Schuwer; the first page reference refers to the German edition of *Husserliana*, and is followed by the reference to the English translation.

natural properties was permissible to the extent that the status of these objects as natural is correlative to the attitude adopted towards them (i.e., the naturalistic one).[24] Thus, although Husserl did not endorse ontological natural*ism*, he did view it as legitimate to speak of the mind and the lived body as natural entities. The antecedent of the conditional version of methodological naturalism thus obtains with regard to the lived body and the mind in Husserl's account.

Now, for the consequent. Husserl argued that, insofar as they were natural objects, the mind and the lived body could be (at least partially)[25] accounted for by employing

[24] To be sure, the mind and the lived body are not exclusively objects pertaining to the ontological region nature. The mind, when considered in its relation to what Husserl called the spirit (*Geist*) is a "spirit-mind." Although the term *Geist* may seem odd to the contemporary reader, Husserl is using it as was commonplace in his time, to refer to the cultural existence of human beings. Hegel had also used the term *Geist* in this sense, and moreover, the sciences interested in culture and history were referred to as *Geisteswissenschaften*, or sciences of spirit. When viewed as a spirit-mind, the mind "is not defined as a real unity in relation to circumstances of Objective nature, thus psychophysically," but Husserl immediately adds, "or at least *does not have to be* defined that way" (*Ideen II*, 280; Husserl 1989, 293, emphasis added). Thus, there are ways of apprehending the mind such that it is not understood as a natural object, but rather as a cultural or historical phenomenon. But this does not preclude an understanding of the mind, even as a spiritual or cultural mind, as being related to nature. The regularities of the mind as spiritual, its "immanent lawfulness," can in principle also be "apprehended as natural" insofar as they are tied to psycho-physical regularities. The lived body, when considered in relation to *Geist*, also acquires a spiritual status, as a "lived body for the will, the freely moving body," distinct from the body as physical-aesthesiological unity (*Ideen II*, 284; Husserl 1989, 297). This is why Husserl can be said to definitively reject ontological naturalism: the mind and the lived body are more than mere natural objects. However, he does endorse the view that the mind and the lived body can legitimately be considered as natural objects, as part of the regional ontological domain of natural entities, so long as we do not conflate this with a metaphysical thesis.

[25] A discussion of the "science of the mind" proposed by Husserl would vastly overshoot my aims here, and so I shall focus on the science of the lived body. However, a few remarks can be made. In *Ideen II*, Husserl argues that there could be a science apt to study the motivational structure of the mind. He writes that, just as we learn to know objects following their kinds and the lawful behaviors pertaining to those kinds, we can "capture the development of a person if we reconstruct the course of his life and make it intuitive in such a way that the entirety of his development as a man becomes comprehensible in an experiential way, especially with regard to his manner of letting himself be motivated as a subject, together with all the definite actions and passions proper to him" (*Ideen II*, 272; Husserl 1989, 285). Such a science would be a "science of the mind," a "psycho-logy." Husserl argues, however, that such a science could not be carried out in the naturalistic attitude. This is because such a science of the mind is interested in the person or personal ego, only apprehensible in the personalistic attitude; as such, it would investigate motivational relations, invisible to naturalistic apprehension, rather than causal ones. Husserl's proposal of a science of the mind is not, under this description, a natural science. However, in

natural scientific methodologies. This, I argue, shows that Husserl endorsed a form of weak methodological naturalism that included the mind and the lived body as natural things and properties as part of its antecedent. I shall focus on his argument for the possibility of developing a science of the lived body and its relation to the mind, which he called "somatology." But before turning to somatology, I quickly review Husserl's account of the lived body and its relation to the mind.

The lived body, for Husserl, is both a physical thing and an animated living thing, and is in its animation intrinsically tied to mental life. This dual nature of the lived body is reflected in its having both an "inner" and an "outer" dimension (summarized in *Ideen II*, §42). Viewed from the "outer attitude," the body exists in the substantial sense as a physical thing (*Leibkörper*), participating in the manifold of causal interactions with other physical things. For Husserl, to know physical reality is to know the causal relations that underlie the noematic appearance of that reality (*Ideen III*, 3–4). Like other actually existing, real (*real*, not simply *reell*) objects, the *Leibkörper* gives itself as a "substance", as the stable something which underlies and determines the causal changes in the noematic configurations of the sensory contents of lived experience.[26]

Ideen III, Husserl suggests that psychology, as a natural science interested in the mind, would investigate relations of "psychological causality," which suggests that the naturalistic attitude might be appropriate to study the mind on his account (see *Ideen III*, 16). Is Husserl's science of the mind, his psycho-logy, a natural science? To decide this is well beyond the scope of this chapter. I shall thus focus on Husserl's proposal of a science of the lived body in its relation to the mind that can be unambiguously understood as a natural science.

[26] In a useful footnote, Husserl gives a definition of "substance." He writes: "Substance signifies here nothing more than the material thing as such, considered to the extent that it is the identical something of real properties, that which actualizes itself temporally in regulated manifolds of states in regulated dependency on concomitant circumstances" (*Ideen II*, 44, footnote; Husserl 1989, 47). For the relation between materiality and substance, see *Ideen II*, §§12–15. We should note a debate in contemporary Husserl scholarship over the representational status of the noema, and its relation to the real object. For "West Coast" thinkers (such as Føllesdal, Dreyfus, and McIntyre), the noema is akin to the Fregean sense. It is a kind of mediator entity between the object and the world. This commits West coast interpretations to the idea that Husserl was a representationalist. "East Coast" interpretations (like Sokolowski's or Drummond's), on the contrary, claim that the object is a moment in the noema, and understand the relation between object and noema as one of identity to manifold. For East Coast interpretations, the noema is the object seen under a phenomenological lens in its meaningfulness

Objectivities such as these can only be fully determined in intersubjective scientific experience (*Ideen II*, §18, esp. f, g, and h, §§43–47, and §§51–53; *Ideen III*, §1). The object is what it is only relatively to a set of causal circumstances; its individuation is relative to these circumstances (*Ideen II*, 41ff, 298ff), and it can only be known if one uses a methodology specific to its encounter as a substantial object. This is where the natural sciences enter into our account. The object and its real properties, that is, the "determinable X" (*Ideen I*, §§97–99, §131) or experiential correlate of any possible rational subject (*Ideen II*, 131), can only be apprehended as such in intersubjective natural scientific investigations. Empirical experimental methods, which recreate specific conditions experimentally in controlled contexts, need to be employed to study the stable identity of real objects in the face of changing circumstances. The lived body, being in part a constituted *Körper* like any other natural object, is thus best investigated in its factual existence with natural scientific methodology (e.g., neurophysiology, physics, etc.).

On the other hand, viewed from the "inner attitude," the body is a living, sensing body, the "bearer of sensations" (*Ideen II*, 161). Insofar as it is animate flesh, over and above its physical "layer," the *Leib* includes for Husserl a layer of inherently localized sensations or "sensings" (*Empfindnisse*) that are constitutive of it as a lived body in the strict sense. This intrinsically localized stratum of the lived body is precisely its "aesthesiological" dimension (*Ideen II*, §36, esp. 145–146). *Empfindnisse* differ from ordinary presentative sensations (*Empfindungen*) because they have a dual function in the life of the mind (*Ideen II*, 144ff). Such sensations are "double-sensations" *(Doppel-Empfindungen*, see *Ideen II*, 147). On the one hand, they allow us to sense determinate properties of things, like ordinary sensations; they thus have a presentative function, in that they present a thing *leibhaft*. On the other hand, sensings are perceived as

(*Seinsinn*). See, e.g., Føllesdal (1969; 1974); McIntyre (1982); Sokolowski (1987); Drummond (1990); Drummond & Embree (1992), Zahavi (2004a).

pertaining directly to the lived body. The same tactile sensation thus supports two possible apprehensions: e.g., when I touch an object, the sensation of touch can be interpreted as either a sensation of the lived body, indicative of it as a sensory field (e.g., "my hand is touched here"), or as a sensation of touching something, which reveals the material nature of the object apprehended ("I am touching something here"). The aesthesiological lived body is the original source of spatial localization; it is the medium through which all determined spatial properties of real objects are apprehended (*Ideen II*, §§36–40). I feel the real properties of objects in the world "on" and "in" the lived body.

The lived body as a whole is both *Leib* and *Leibkörper* simultaneously, and encompasses both sides at once. When discussing the disclosure in lived experience of my hands touching each other, Husserl refers to the hand as a "physical-aesthesiological unity," an enmeshment of aesthesiological *Leib* and *Leibkörper* (*Ideen II*, 155). It is only in the abstract, Husserl continues, that one can separate the layer of localized sensations from the physical body. We can characterize the lived body in this way as well, as a unity of *Leib* and *Körper*. While sensings are not properties of the body as a mere physical thing, they are properties of the lived body as a whole, as a physical-aesthesiological unity of *Leibkörper* and *Leib*.[27] As indicated, the lived body as physical-aesthesiological unity is apprehended in the naturalistic attitude, and such can legitimately be considered as a natural object (*Ideen III*, §2). The lived body, then, even when considered as aesthesiological, can thus legitimately be apprehended as a natural thing and, by implication, can be studied with methods adequate to such a thing

[27] Husserl writes: "The localized sensations are not properties of the [lived body] *as* a physical thing," immediately adding, "but on the other hand, they *are* properties of the thing, [lived body], and indeed they are effect-properties. They arise *when* the [lived body] is touched, pressed, stung, etc., and they arise there *where* it is touched and at the time *when* it is touched [...]. Touching refers here to a physical event." (*Ideen II*, 146; Husserl 1989, 153–154). *Leib* and *Leibkörper* thus form a unity that can only be dissociated in the abstract.

(i.e. natural scientific methods). Such a peculiar object, however, requires a special science, namely somatology.

How does the mind relate to the lived body? Now, as indicated, the mind is also something given in the naturalistic attitude, and can thus also be apprehended with legitimacy as a natural thing. Apprehended as a natural thing, the mind and its states are intimately related to the lived body. When considering its relation of dependence to different kinds of circumstances, Husserl argues that the mind admits a kind of stratification into three "sides": a psycho-physical side, an "idiopsychic" side, and an intersubjective side (*Ideen II*, 135ff). The psycho-physical side of the mind is the mind considered in its relation of dependence to physical circumstances (*physischen Umständen*), and notably to the causal processes and circumstances of the lived body. The idiopsychic side of the mind refers to the way in which the mind is a circumstance for itself, that is, how its own internal circumstances (e.g. its history and idiosyncratic set of motivations) in part determine the course of its mental life. The intersubjective side of the mind refers to the way in which the mind and its (real) ego are constituted as an objectively existing object (albeit of a special kind; see *Ideen II*, §§31–33) in its relation to other knowing subjects (see, e.g., *Ideen III*, 109–115). I shall focus in what follows on the psycho-physical side of the mind and its relation to the constituting factor that is the lived body. Indeed, the connection of the lived body to the mind and its sensory states is the main theoretical object of interest in somatology.

4.2. Somatology and psycho-physical dependence

As indicated, Husserl proposed a specific science to address the lived body in its specificity. He called this science "somatology" (*Ideen III*, §§2–3). Somatology is a natural science interested in the corporeity (*Leiblichkeit*) of the lived body, that is, the

"sensitiveness" (*Empfindsamkeit*) that makes it a lived body *per se*, and on Husserl's definition, it includes the various empirical theories of sensation in empirical psychology (*Ideen III*, 9). Specifically, somatology studies the sensitiveness of the lived body, in particular the layer of real properties of the lived body that have an intrinsic localization, and studies more generally the various sense fields insofar as they are states of the lived body. Husserl divides this science into two different kinds of investigation (*Ideen III*, 18–19). On the one hand, "physical somatology" elucidates what I shall call the physical-somatological dimension of conditionality, that is, the relations of psycho-physical dependence and conditionality that obtain between physical states of the body and sensory states of the mind. "Aesthesiological somatology," on the other hand, deals directly with the various sensory fields comprising the aesthesiological dimension of the lived body and the dependence relations among these fields, and it studies what I shall call the aesthesiological-somatological dimension of the dependency between mind and lived body. Although not a material science, it is nonetheless a natural science, because its object of study is a natural one, a natural reality that is part of the causal nexus of the ontological region nature and that is given in the naturalistic attitude. For my purposes here, I shall mostly be concerned with the first, physical kind of somatology.

How do the physical states of the body affect the mind and its sensory states? Mind and lived body form a "concrete unity" on Husserl's account (*Ideen II*, 161). When discussing the concrete unity of mind and lived body, and how states of the lived body affect states of the mind, Husserl speaks of "psycho-physical conditionality" (*psychophysischen Konditionalität*; see *Ideen II*, §18, esp. 64ff). Conditionality is a relation of functional correlation between various changes in the unfolding of experience, or "phenomenal 'if-then'" relations, as he puts it (*Ideen II*, 155). For example, if my body moves or is affected in such and such ways, then my experience will change in functional correlation with these changes. The mind's being affected by the lived body is regulated by relations of psycho-physical dependence and

conditionality. In being so related to the lived body, the mind acquires "psycho-physical properties"; although it is not substantial in the same sense as the lived body, and not itself located in objective space and time directly, it becomes indirectly located in the world through its embodiment (*Ideen II*, §§31–33, §46). The lived body, in forming with the mind a concrete unity, is a "turning point" (*Umschlagstelle*, see *Ideen II*, §§41–42) where ordinary causal relations are transformed into relations of conditionality. Changes in some states of the lived body produce changes in states of mind: the various causal circumstances that stimulate the lived body affect the mind in correlative ways, given its psycho-physical side. The mind in this way becomes permeable to the causal interactions of things in the world through the lived body, which in acting like a turning point, allows the mind itself to be in the world. The mind is in, and open to, the world because it is connected to the body.

Husserl explicitly acknowledges the dependence of the lived experience of the mind on specific "bodily states" (*leiblicher Zustände*), especially those of the brain or "central organ" (*Zentralorgan*) and its brain-states (*Gehirnzustände*; see *Ideen II*, 290ff). He suggests that the lived body, considered in its relation to the psycho-physical side of the mind, acts as the source of changes in the sensuous content that reaches consciousness (see, e.g., *Ideen II*, 135, 164–165, 289ff, 295; *Ideen III*, 17). The relation of physical stimulation to sensation is one of psycho-physical conditionality and dependence: changes in states of the mind are functionally correlated to, and depend on, changes in the states of the body (*Ideen II*, 154ff).

How do these correlations operate? Husserl states that the various sensory fields (visual, auditory, tactile) are always saturated with sensation, and these sensations are subject to change in the flux of experience. Now, the lived body is a sensitive thing. Intrinsic to the lived body is the very important psycho-physical property of sensory sensitiveness (*Empfindsamkeit*) to the world. This sensory sensitiveness functions as an opening of the mind to the physical world. Certain changes in states of the physical

lived body (notably state changes in sensory surfaces, nerve endings, and so forth) are, Husserl argues, functionally correlated to the manifold changes in the contents of lived experience, such that changes in sensory states of mind depend on changes in the state of the lived body (*Ideen II*, 155). This is psycho-physical dependence or conditionality. He writes:

> What can be apprehended as localized stratum of the [lived body] as well as what can be apprehended as dependent on the [lived body] (in the full sense of [lived body], including this stratum already) and on the "sense organs," all this forms, under the heading of the matter of consciousness, an *underlying basis of consciousness* and undergoes its realizing apprehension in unity with this consciousness as [mind] and [mental] ego. (*Ideen II*, 157; Husserl 1989, 164, trans. mod., emphasis added)

Husserl is here arguing that the matter that at all times fills the various sensory fields of lived experience stands in a relation of functional dependence to, and arises from changes in states of, the lived body. The relation of psycho-physical dependence is such that a kind of bodily state has, "as its univocal and Objective consequence, a certain sensation in a determinate stream of consciousness bound to its respective body" (*Ideen II*, 290; Husserl 1989, 304). Sensory states of the mind thus depend on physical states of the body.[28]

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[28] Yoshimi (2010, 30–33) has proposed a formalization of the dependence relation between physical states of the body and sensory states of the mind as presented in Husserl's account. In order to capture the relation in Husserl's account, he proposes to define a supervenience function that relates two state sets, which are sets such that the system modelled can only be in one unique state in the set at a given time. Supervenience, in this context, is a relation between state sets, such that a state set A supervenes on another state set B iff objects that are B-indiscernible are also A-indiscernible. A supervenience function f: $B \rightarrow A$ is a function that relates two state sets, such that when the system is in state b in state set B, it is in a unique supervenient state $f(b)$. (Note that Yoshimi formulates "partial" and "total" versions of the supervenience function, which I cannot go into here, given space constraints). With P as the state set of all possible physical states of a system (say, an organism), and S as the state set of all possible sensory states of that system, Yoshimi captures the dependence relation with a (total) supervenience function f: $P \rightarrow S$, such that when the organism is in physical state p (in state set P), it is in a unique sensory state $f(p)$. He further argues that Husserl rejects total supervenience (2010, 33–36), and that Husserl's argument against total supervenience fails (2010, 36–38).

Somatological science would employ the methodologies of the natural sciences in order to elucidate the contribution of the lived body (and its being embedded in the nexus of causal relations) to the constitution of things in lived experience. Thus, to psycho-physical conditionality "appertains *somatological causality*, which immediately always concerns the relations of the irreal, of an event in the subjective sphere, with something real, the [lived body]: then mediately the relations with an external thing which is in a real, hence causal, connection with the [lived body]" (*Ideen II*, 65; Husserl 1989, 70, emphasis in original). The science of somatology is thus one that investigates the participation of real, constituted structures such as the sense organs and the nervous system (what he metaphorically calls "underlying basis") in the process of constitution. The causal status of psycho-physical dependence and conditionality is difficult to appraise in Husserl. The language he uses is ambiguous. At times, Husserl speaks of dependence and conditionality as if they were causal relations, as in the remark cited above on "somatological causality." In other places, Husserl makes claims that are incompatible with a causal interpretation of the dependence relation, as we he remarks that "the relation between sensation and Corporeality must be thought of as simultaneous" (*Ideen II*, 295; Husserl 1989, 309).[29] He also sharply distinguishes between the ordinary causal dependence that regulates changes in physical objects and the special kind of dependence that characterizes the relation of sensation to the lived body; conditionality is not to be conflated with physical causality (*Ideen II*, 295; also see *Ideen II*, supplement XII, part I, §2). As Welton (1999, 49ff) notes, Husserl acknowledged that psycho-physical dependence relations, which tie localized sensations and physical localizations of the lived body, are of a different nature than

[29] In this passage, Husserl argues that the effect of the body on sensation is synchronic. It is generally accepted that causal relations cannot obtain between two simultaneous events; to the contemporary reader, if Husserl's account of the dependence relation is correct, that relation cannot be a causal one. This provide support for Yoshimi's account of psycho-physical dependence as a supervenience relation (discussed in the previous note).

the relations of foundation and dependence that obtain between dependent moments in ordinary relations of eidetic foundation.[30] The relation here is not one between dependent moments essentially supplementing others, but rather between a real, constituted unity, part of the region nature, and sensations; Welton suggests to understand this relation as a causal one "in a special sense of the term [causal]" (1999, 49). This special sense is as a conditional relation, a phenomenal if-then. The lived body, as a unity of sensory fields and specifically as aesthesiological, stands in a relation of conditional functional correlation and dependence to the physical body, such that changes in the state of the physical body "cause," as their effects, changes in states of the lived body and its sensory fields (*Ideen III*, 18). Physical somatology is the science that can study the psycho-physical dependences and conditionality relations that obtain between constitution of meaningful objects in the mind and the states of the lived body.

But how does this relate to constitution? Husserl acknowledged that the lived body had a crucial role to play in constitution, and it is this role that is studied by the science of somatology. In Husserl's theory, the basic stratum from which all things are constituted is the sensuous matter that upwells in the different sensory fields. Sensations or "sense-things," i.e. the sensory concrescences in lived experience, are the "primal constitutive objects" (*Ideen II*, §8). Husserl argued, then, that sensation is the foundation of all constituted unities. The body, in providing lived experience with the requisite foundation for the constitution of any kind of thing, acts as an "underlying basis" for consciousness and its constituting activity. The expression "underlying basis" might be interpreted as a variant of the foundation relation, denoting a psycho-physical dependence relation. The lived body, then, acts as a condition of possibility for

[30] Husserl argues that states of sensation and the lived body are connected "certainly not in the way in which the sensation-content, tone quality, and the sensation-content, intensity, have an essential unity, nor is it the way in which the sensation-content, color, is unified with the moment of spread [...]" (*Ideen II*, 154; Husserl 1989, 161).

constitution, despite itself being a product of constitution. First, the lived body is the source of all changes in sensory data, which form the basis from which all objective unities are constituted in conscious experience. This is what we might call the "physical-somatological" dimension of psycho-physical conditionality (in accordance with Husserl's divisions of somatology, indicated above). Second, it is the "bearer of sensations" and, given its status as "aesthesiological," it has, as the original source of localization, a role in constituting spatial things; this is the "aesthesiological-somatological" dimension of conditionality. Both these kinds of conditionality relations entail that the lived body, although constituted, is itself, in its dual nature as physical *Leibkörper* and aesthesiological *Leib*, a transcendental constituting factor in the unfolding of lived experience. Indeed, although the intentional functions (remembering, perceiving, valuing) are not unilaterally determined by the lived body, they are nevertheless "bound to this stratum" or sensory content; and in this way, "a human being's total consciousness is in a certain sense, by means of its hyletic substrate, bound to the [lived body]" (*Ideen II*, 153; Husserl 1989, 160, emphasis removed).

Somatology would differ from psychology in its treatment of sensations; that is, while somatology would apprehend sensations as providing access to a living flesh, psychology apprehends sensations insofar as they are part of the life of the mind, contributing to the constitution of transcendent objects in that life by "figuring for" them (*Darstellung*). Somatological science would provide a natural scientific and explanatory account of the "underlying basis" of mental life. In somatology, then, Husserl is proposing a specific natural science to study the relations of dependence between the lived body and the mind. This science would be apt to study the contribution of the lived body to constitution by elucidating the dependence of the mind on psycho-physical lived-bodily factors.

Although Husserl rejects strong methodological naturalism, he demonstrably endorses a conditional, weak form of methodological naturalism: *if* the lived body and the mind can legitimately be apprehended as natural entities with natural properties, *then* the most adequate method for their study is one coherent with those of the natural sciences, e.g. somatology and psychology. Even on Husserl's transcendental account, then, the real factors that partake in the process of constitution can be studied by the natural sciences, if approached correctly. For the transcendental phenomenologist, such an investigation need only be grounded by an *a priori* eidetic clarification of the ontological region or domain of objects. Husserl did not reject the *restricted*, conditional form of methodological naturalism, and even went some ways towards providing a framework in which the relation of the lived body and the mind could be experimentally established.

Contemporary research projects in cognitive science (e.g., the attempts to naturalize phenomenology discussed above) might arguably be seen as forms of somatology, proposing naturalistic accounts of the "underlying basis" of constitution.[31] If this appraisal is correct, these research projects already provide a scientific framework in which to ascertain and explain precisely what dependencies exist between the lived body and mind, and how they operate. The "naturalized phenomenologies" could thus be rightly held as relevant to transcendental investigations, insofar as they address constitution and are viewed as, or as participating in the elaboration of, naturalistic theories dealing with the contribution of the lived body to constitution. Such a position, however, at least as seen from the transcendental perspective, rests on these approaches

[31] Given space constraints, I cannot provide an exhaustive account of the similarities between Husserl's somatology and contemporary research projects. Research projects such as the enactive or embodied approach, first proposed by Varela, Thompson, & Rosch (1991), and developed since its inception by thinkers like Gallagher (2005), Noë (2005; 2009; 2012), and Thompson (2007), illustrates both kinds of somatological approaches. The more biologically-oriented approach espoused by Thompson and his collaborators and its close relation to neurophenomenology make it well suited to study the physical-somatological conditionality relations. The more sensorimotor orientation of Gallagher and Noë seems especially well suited to exploring the aesthesiological dimension of conditionality.

rejecting the forms of naturalism that Husserl believed were untenable (as indicated: strong and weak variants of epistemological naturalism, strong methodological naturalism, and ontological naturalism). Crucially, even if we decide that current research projects do not fit Husserl's description of somatology, we have still established, within Husserl's transcendental phenomenological framework, the possibility in principle of natural sciences apt to address the underlying basis of constitution.

To summarize, with his exploration of psycho-physical dependence and conditionality, Husserl recognized that the lived body, despite its being a constituted object, plays a crucial role in the constitution of all objects, as a transcendental condition of possibility of their disclosure to consciousness. Moreover, he proposes a distinct natural science closely related to psychology, which he calls somatology, apt to study the lived body in its *Leiblichkeit*. Such a science would employ the methodologies of the natural sciences to study the participation of lived bodily structures in constitution, and are legitimate to the extent that the lived body and the mind can be apprehended as natural things correlated to the naturalistic attitude. This shows that Husserl endorsed a weak, conditional form of methodological naturalism. Thus, far from contradicting his approach, the natural sciences actually fit into the overall transcendental framework.

5. Transcendentalism, eidetics, and naturalized theories of constitution

We have thus established that Husserl endorsed a restricted form of methodological naturalism. There is room in Husserl's transcendental edifice for a contribution from the natural sciences to answering the many issues raised by constitution. A question arises at this point, however, which is that of determining the extension and mutual

limits of such naturalistic explanations with regard to the investigations of transcendental phenomenology and its methods of investigation. I now turn to this.

After reviewing the foundational role of transcendental phenomenology with respect to the natural sciences, I argue in this section that the natural sciences can readily be viewed as contributing to the transcendental project, if they are reinterpreted as naturalistic theories dealing with how various real (and as such already constituted) factors, entities such as structures of the body, are also constituting factors, which play a direct role in the constitution of other meaningful objects. These sciences might be elliptically described as "sciences of constitution." In addressing the real factors that participate in constitution, such sciences make a *bona fide* contribution to the edifice of transcendental phenomenology.

Husserl, as we have seen, acknowledged that the lived body is a transcendental factor in the constitution of meaningful objects. We might ask, to what extent can the natural sciences be called upon to study constitution? Is it not the case that a naturalistic explanation of the real factors that participate in constitution might exhaust all there is to say about constitution? I would answer in the negative. Why not? Recall that transcendental phenomenology is a descriptive epistemological and eidetic discipline. With regard to the natural sciences, as indicated in section 3, its role is twofold. First, its specific epistemological task is to justify transcendence in immanence, in other words, how it is that the immanent states of lived experience can be *about* something transcendent, out there in the world. Second, its descriptive eidetic task with regard to the natural sciences is to clarify the ontological regions where these sciences operate by providing a phenomenological description of the material *eidē* and material *a priori* eidetic laws pertaining to those regions (*Ideen III*, §§7–8).

When applied to the naturalistic study of mental realities, transcendental phenomenology is tasked with elucidating the essentially necessary and essentially

possible relations between the mental on the physical. The specific function of transcendental phenomenological eidetic analysis with regard to the study of mind-body dependencies is that of determining the possible extension that these dependencies can have in theory. This determination proceeds according to the eidetic laws that pertain to the realities in question. For instance, eidetic analysis reveals that to apprehend an animal nature, I must perceive the physical reality to which it is attached (*Ideen III*, §2). The task of experimental psycho-physiological research, on the other hand, is to examine the actual extension of the dependence relations by employing their natural scientific methodological framework. Speaking of the dependence of states of consciousness (sensory states, sensuous feelings, instincts, and even individual *habitus*) on physical states, such as those of the brain, Husserl writes:

> Obviously, how far [psycho-physical dependence] extends *can only be decided empirically, and if possible by means of experimental psychology*. In particular, whether and to what extent the proper character, the rhythm, of the higher consciousness is determined by means of its own empirical-psychological rules as well as according to what is universally human, though not by essential laws, i.e., according to what unfolds in the human type (the type of the human species) and within the individual type, or whether these regularities in the type and in the individual are sufficiently grounded in the physical organization by the mere introduction of essential laws: *this can by no means be established apriori*. (*Ideen II*, 295; Husserl 1989, 309, emphasis added)

Neither the transcendental not the eidetic reductions can be used to investigate the domain of natural causality, psycho-physical conditionality and dependence relations between the mind and the lived body, precisely because they bracket factual matters entirely. We can see that eidetic description provides *a priori* necessary conditions on the extension of psycho-physical conditionality and dependence without for all that providing *sufficient* conditions thereof. Thus, while transcendental phenomenology has epistemological priority given its *a priori* status, Husserl seems to suggest that it is not in a position to assess with its own methods the actual extension of the mind-body

dependence, because it is interested in eidetic truths, rather than matters of fact and contingent empirical laws.

As Sokolowski pointed out, the fact that phenomenology cannot provide an exhaustive or adequate account of the constitution of objects (i.e. the necessary and sufficient conditions of constitution) was no cause of concern for Husserl. He argued that the father of phenomenology, at least by the *Cartesianische Meditationen*, had given up on founding a phenomenological science that was both adequate and apodictic, and only held on to apodicticity in his final works (1964, 185ff). In its description of the essential structures of conscious experience, transcendental phenomenology need only give necessary, and not sufficient, conditions of possibility for meaningful encounters with things in the world (1964, 137–139, 159, 201). To the later Husserl, it had to suffice transcendental phenomenology that it describe with apodictic certainty the kinds of essential structures found in lived experience, as phenomenology could not singlehandedly attempt to provide an exhaustive and adequate account of the genesis of every meaningful structure, and ought therefore to be supplemented by natural sciences. This was already presaged by Husserl's proposal of a somatology in *Ideen III* and his acknowledgment of the limits of his own approach. If phenomenology was to remain closed upon itself, what purpose could such statements have?

Empirical sciences and transcendental phenomenology are thus not competing approaches. Their domains of truth and necessity are disjoint. As indicated in section 3, eidetic sciences are not interested in factual matters. Eidetic sciences only employ individual beings in their investigations insofar as the latter can serve to illustrate a given eidetic law. It simply cannot be the case that the accounts they provide are in competition with one another. Rather, transcendental phenomenology provides an epistemological foundation of the natural sciences, and clarifies their ontologies by uncovering *a priori* eidetic laws that govern the ontological regions in which they operate, which in turn ground the contingent truths they evince (*Ideen III*, 48–49).

What role, then, do natural scientific investigations play in the transcendental edifice? I argue that what we can call "sciences of constitution," the natural sciences that investigate the real factors participating in constitution, can provide a set of conditions relative to the occurrence of a given kind of comprehensive unity in the experience of an individual embodied psycho-physical subject or class of embodied subjects. In other words, the function of what I have called sciences of constitution is to elucidate the conditions in which occur this or that kind of comprehensive unity (say, a visual datum) in lived experience, relative to a given class of embodied subjects. When the issue at hand is the relation between sensation and the lived body, the specific form taken by constitutional-scientific investigations would be somatology; however, we can imagine that other aspects of lived experience might also be conditioned by other kinds of real factors, such as belonging to a culture or society.[32] The usefulness of the more general expression "sciences of constitution" is that it leaves this possibility open.

In his discussion of psycho-physical dependence and conditionality, Husserl suggests that the embodied disposition of psycho-physical subjects determines whether or not certain kinds of comprehensive unities will be experienced by those embodied subject. Consider the case of blindness with regard to the material eidetic laws that pertain to visual experience. A person blind from birth does not experience visual data, and therefore experiences neither color nor extension in the visual field. Does this mean that eidetic laws pertaining to color experience (e.g., the supplementation of COLOR by EXTENSION for any comprehensive unity COLOR DATUM) do not apply to the blind person? Certainly not. Recall that Husserl argued that it was a material *a priori*

[32] The cultural variability of the perception of illusions, such as the Müller-Lyer illusion (see, e.g., Segall et al. 1966), suggests that real factors other than the lived body, such as the cultural and historical situation of the perceiving subject, might also be relevant to study with regard to their effects on constitution. Husserl's proposal of a "science of the mind," elucidating the person's history of sedimented motivations, actions, and passions, could be counted as another example of a "science of constitution"—although admittedly, the status of such an investigation as a natural science remains debatable. See p. 23, note 25.

law that all occurrences in experience of comprehensive unities subsumed under the *eidos* VISUAL DATUM must necessarily (in virtue of what it is to be a VISUAL DATUM) have co-dependent moments subsumed under the *eidē* COLOR and EXTENSION. We can express this in conditional form, as follows: *if* an organism *X* has the experience *E* of the type COLOR DATUM, then that color datum must (essentially necessarily) be experienced as having co-dependent and co-supplementing moments of the type COLOR and EXTENSION.

Now, it is demonstrable that the occurrence of a given kind of comprehensive unity in experience is made possible by the activity of certain *reale* bodily structures. That is, there are specific empirical conditions under which the antecedent of the conditional statement of an eidetic law (in the case being examined: "*if* an organism *X* has the experience *E* of the type COLOR DATUM") can indeed obtain. In cases of visual experience, these conditions include the normal ones under which a particular class of organism can have visual experiences (e.g., having functional retinae, an intact brain area V1). Even though a blind person cannot have experiences of the type VISUAL DATUM (and as such, cannot have an experience of the type COLOR, nor of the type EXTENSION), it is not that the eidetic law does not apply in that case. It is only that certain real structures, which are sufficient for visual experience in normal individuals, are not present or dysfunctional in the case of the blind individual; and so, in such cases, the antecedent does not obtain. The implication, however, can be true even if the antecedent is false; the experience of a moment of COLOR *would* be supplemented by a moment of EXTENSION in the experience of the embodied subject *X*, if *X* could see, or have her sight restored. In other words, if the conditions under which *X* can have the experience *E* of a visual datum did obtain, then there could be occurrences of the type VISUAL DATUM in the experience of *X*, and then the eidetic laws that pertain to visual data would in turn apply to *E*.

I suggest that sciences of constitution, which elucidate the real lived bodily structures that participate in constitution, should be understood, within Husserl's transcendental phenomenological framework, as providing conditions on the antecedent of conditional statements of the relevant eidetic laws. Physical somatology, for instance, is tasked with elucidating physical-somatological, lived bodily conditions on the occurrence of changes in visual data in lived experience. This, however, does not mean that the natural sciences thereby explain or "explain away" material eidetic laws and eidetic necessity. The natural nomological regularities uncovered by sciences of constitution only show how certain kinds of *reale* structures participate in constitution by making possible the occurrence of this or that kind of comprehensive unity in the experience of an embodied subject. If these comprehensive unities occur in experience, then the relevant eidetic laws obtain (with eidetic necessity). Thus, it is not the case that the natural sciences, on this account, "explain" eidetic laws, nor is it that the natural nomological laws they uncover are in any sense equivalent to eidetic necessity. It is only that for certain kinds of content to occur in the lived experience of embodied subjects (such as we humans), certain real bodily structures must be present and must function in the normal way. The specific task of what I have called sciences of constitution would be to investigate those sets of empirical conditions on normal experience that make possible the occurrence of this or that kind of comprehensive unity in embodied lived experience. In cases where there obtain relations of psycho-physical dependence, sciences of constitution could probe into the nature of that dependence relation, and provide empirical laws that account for the regulation and functional dependence of certain kinds of mental states (e.g. sensory states) and states of the lived body. As Husserl himself argued, to determine the specific empirical conditions leading to various kinds of modification in sensory experience is not a task for transcendental eidetics. It is a task for the natural sciences. The natural sciences simply operate within the possibilities left open by transcendental investigation. As long as the domain of the eidetic remains neatly separated from the domain of the

factual, there is no contradiction between natural science and transcendental phenomenological eidetic investigations.

The epistemological vocation of phenomenology is its most central aspect. Transcendental phenomenology, as Husserl understood it, justifies the claims of the natural sciences by clarifying what it is we are doing when we go about our scientific activities. It is, on its own account, the point of view adequate to appraising the various attitudes we as knowing subjects can have towards the world. It shows, for instance, how the naturalistic attitude, which yields natural objectively existing objects and predicative knowledge, is itself grounded on a more fundamental, "personalistic" attitude, in which we are together as peers, as persons (*Ideen II*, §51, and 288 n.1). Transcendental phenomenology can play this foundational role because it elucidates the genesis of meaningful structures in its study of the genetic dialectic between predicative apprehension and pre-predicative encounter, and investigates the *a priori* eidetic laws of consciousness. All this entails that, even if it was the case that naturalized theories of constitution were to provide an exhaustive account of the real factors that participate in constitution (which is no small feat), transcendental phenomenology could still retain its fundamental epistemological role.

So much for naturalized sciences of constitution within Husserl's transcendental framework. These sciences, which, like somatology, provide conditions on the occurrence of this or that kind of comprehensive unity in experience, only require that the transcendentalist endorse weak methodological naturalism, and are coherent with Husserl's overall transcendental phenomenological approach. If eidetic necessity is neatly separated from natural nomological necessity, and if we distinguish the function proper to each in the overall framework, then the natural sciences do not conflict with transcendental phenomenology. Of course, some may want to question the validity of such a separation between material eidetic laws and necessity, and natural nomological ones. This is clearly the view held by those who would naturalize material *eidē*, such

as the foundation of COLOR on EXTENSION given the unity COLOR DATUM, or again the temporal structure of *Ce*. Those thinkers might want to provide empirical conditions not only on the occurrence of certain kinds of comprehensive unities in lived experience, but also on eidetic material *a priori* laws themselves. In this case, what I have called sciences of constitution might extend their explanatory efforts beyond the antecedent of the conditional formulation of material *a priori* laws, into the eidetic law itself. This is arguably what the "naturalized phenomenologies," especially the formalized approaches, have attempted to do. Although the constitutional-scientific framework I have proposed arguably applies to such cases, my aim in this chapter has been to provide an account of naturalism that is compatible with, and remains within the limits of, Husserlian transcendental phenomenology. The projects to naturalize phenomenology, insofar as they adopt variants of epistemological naturalism, clearly step outside of the transcendental framework as Husserl understood it. But is such a move legitimate? This is still an open question.

Conclusion

My aim was to clarify the relevance of the natural sciences, and especially cognitive science, for transcendental phenomenology. I hope to have shown how transcendental phenomenology and the natural science are both important parts of the overarching transcendental project, each having its specific function and domain of inquiry. When seen as "sciences of constitution," as natural sciences investigating the real structures that participate in constitution by functioning as empirical conditions for the possibility of this or that kind of comprehensive unity in the experience of embodied subjects, the naturalistic theories of cognitive science (and other disciplines) can complement and even supplement the descriptive epistemological endeavors of transcendental phenomenology. In this way, constitution is partially naturalized (insofar as its *reale*

conditions of possibility are elucidated) without usurping the epistemological, foundational role of phenomenology, and without conflating the material eidetic and natural nomological or formal registers. This kind of relationship, I argue, is what we ought to be after, if our goal is a rapprochement of cognitive science and phenomenology that remains true to Husserl's transcendental framework. The natural sciences can thus be seen as figuring in the transcendental edifice, not as its foundation, but as an essential part of the building.

This discussion opens onto questions I cannot address here, such as the value of the phenomenological conception of epistemology, ideality, and normativity for contemporary epistemology. We might inquire whether, and to what extent, the specifically epistemological and normative aspects of transcendentalism in phenomenology ought to matter to contemporary epistemology, which is no longer foundationalist. Our goal, after all, may very well be a rapprochement of cognitive science and phenomenology that steps outside of transcendentalism as Husserl understood it. Epistemological justification and normativity are perhaps what constitute the distinctive philosophical contribution of transcendental phenomenology to the history of ideas, but they are seldom addressed in relevance to current research projects and their epistemological frameworks. I would suggest in closing that further research is required to clarify how the epistemologically normative dimension of transcendental phenomenology can interact with contemporary naturalistic approaches to normativity and justification in epistemology. Can we have foundations and normativity without foundationalism?

CHAPTER II

BURIED ALIVE? A STUDY OF PSYCHOLOGISM AND THE EPISTEMIC CAPACITIES OF CONCRETE AGENTS

Introduction

The aim of this chapter is to evaluate the relevance of "psychologism," or psycho-epistemological arguments, in contemporary epistemology. The chapter is divided into four sections, which are grouped into two parts. The first part is thematic and addresses psychologism. The first section discusses the history of psychologism: its rise after the death of Hegel, its fall at the turn of the century, as well as its recent return in the philosophical landscape under the penmanship of Quine and others. The second section proceeds to situating psychologism with respect to the varieties of naturalism that I identified in the previous chapter. I argue that psychologism, in the sense relevant to naturalistic approaches to epistemology today, is a form of epistemological and methodological naturalism, and admits of two variants: a strong (or replacement) version and a weak (collaborative) one. With this typology of psychologism in place, in the third section, I discuss a central transformation in contemporary epistemology, which complements its investigations into the nature and justification of knowledge with a consideration for the epistemic capacities of concrete epistemic agents, leaving behind discussions of abstract, "pure" or "transcendental" subjects of epistemic faculties. I conclude the first part of the chapter with a short review and critique of Husserl's now canonical arguments against psychologism.

The second part of the chapter examines an argument for weak psychologism, or as I prefer to put it, a psycho-epistemological argument. This argument moves from premises concerning epistemology and epistemic capacities, to considerations about the functional and mechanistic explanation of those capacities by cognitive science, as

well as about the relevance of these explanations for projects in epistemology in terms of rational epistemic action, to the conclusion that epistemology ought to be informed by, and employ some of the methods of, cognitive science. The fourth section presents the argument directly. I proceed to a stepwise justification of the premises of the argument. I first address the issue of normativity, its place in the argument, and the naturalistic fallacy. I then examine the epistemic capacities of concrete agents and the explanation of such capacities by psychology. Finally, I discuss the conclusion of the argument and some of its implications for epistemology. If successful, this psycho-epistemological argument shows why psychology is relevant to contemporary projects in epistemology.

1. A short history of psychologism

"Psychologism" is a resurgent position today, and has become so popular and so mainstream that many simply take its justification for granted. Since Quine's controversial (and now famous) 1969 paper "Epistemology naturalized," many scholars have rallied behind the idea that the natural sciences, and psychology[33] in particular, ought to matter to those involved in epistemological projects, and this, to

[33] Note that I shall mostly use "psychology" as a blanket term to refer to the cluster of *experimental* disciplines working on cognition, including cognitive psychology, cognitive linguistics, neuroscience, etc. Thus, my use of the term "psychology" refers specifically to the *experimental* science, and not to the many philosophical or descriptive psychologies that were popular in the 19th century. I shall use the term more or less interchangeably with the "cognitive science" when discussing psychologism today. This use should not obscure the fact that the empirical science called psychology in the 19th century is different from the investigations carried out today under the same title. (One of the central differences between these two kinds of psychology is the epistemic status of introspective methodology: contemporary cognitive science is much more skeptical about introspection, comparatively speaking; although increasingly, there is renewed interest in first-person, qualitative methods in cognitive science.) However, despite such differences, the arguments for and against psychologism arguably apply to both kinds of psychology, because they are arguments about the empirical, experimental sciences of the mind and their relation to traditional topics in epistemology.

various degrees.[34] Psychologism was thought to have been slain nearly a century ago. For the historically inclined thinker, however, its resurgence should not come as a surprise. 20th century attitudes in philosophy with regard to psychologism, attitudes of virulent rejection, were more of an exception than the rule in the history of the discipline.[35] Although psychologism was thought to be dead and buried for most of the 20th century in philosophy, contemporary debates over the naturalization of epistemology suggest otherwise. Has psychologism been buried alive?

Before discussing the return of psychologism, we ought to discuss its origin in the contemporary context. The end of the 19th century was witness to a great struggle in institutional philosophy, known as the *Psychologismus-Streit*, or psychologism dispute. The intellectual and social context of this dispute was the fall of German Idealism and its repercussions in philosophy. The "same old story," as Kusch puts it in his 1995 sociological analysis of psychologism, is that university philosophy underwent an institutional crisis around the turn of the 20th century. As the story goes, Hegel's death led to the fall of German Idealism in academic philosophical circles after nearly a century of dominance, especially in Germany itself. The effects of this intellectual (and, in effect, political) vacuum were manifold. One of the most important consequences of the fall of Idealism was that many professional academic philosophers

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[34] The advocates of naturalistic approaches to epistemology are now legion. Consider the work of P. M. Churchland (1989; 2007), P. S. Churchland (1986), Giere (1990; 1999; 2010), Giere et al. (2005), Dennett (1983), Millikan (1989), or Dretske (1995), all of whom espouse a version of naturalistic epistemology.

[35] During most of the 20th century, it was very near common sense in philosophy that psychologism was wrong and had already been decisively refuted. McCarthy (1990), for instance, held that the refutation of psychologism was the most decisive event in 20th century. Musgrave (1972) argued that it was a sign that there is progress in philosophy. See Kusch (1995), 2ff. for discussion. However, this attitude is something of an oddity in the history of philosophy, as traditionally, epistemology and philosophical psychology went hand in hand: think of Aristotle, Locke, Hume, or James. It is the new, experimental form of psychology and the reaction of institutional philosophers to it that motivated the brief 75 year hiatus in psychologism around the turn of the century.

turned elsewhere to justify the relevance of their inquiries and practices. This, in turn, led to the rise of many naturalistic views in philosophy, most controversially in logic and epistemology. As Kusch remarks,

> After Hegel's death in 1831, idealistic philosophy in Germany quickly fell into disrepute, and philosophy lost its dominant position in the intellectual field to the natural sciences. Philosophy had to adjust to the change conditions by remodelling itself [in the image of natural science]. This meant that many philosophers adopted a 'naturalistic' or 'positivistic' attitude, i.e. the viewpoint that the ideal of knowledge and the justification of the empirical sciences holds for philosophy as well. [...] This naturalistic stance implied that philosophers sought to solve philosophical problems, e.g. epistemological, logical and ethical questions, by means of empirical research. (Kusch 1997, 2)

Thus, around the end of the 19th century, more and more philosophers were turning to the natural sciences, above all to the burgeoning experimental psychology, in order to legitimate their philosophical practices. Increasingly, around the turn of the century, philosophy chairs in university departments were being filled by experimental psychologists, rather than by (perhaps even at the expense of) what we might call "pure philosophers."[36] Few new philosopher-psychologists had formal philosophical training, which displeased many "pure" philosophers. A crisis in institutional philosophy became inevitable.

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[36] Kusch (1995, 126) provides a numerical appraisal of this rise of experimental psychologists that held positons in philosophy departments:

> For the moment, note that the practitioners of the new (experimental) psychology worked in philosophy departments, and that between 1873 and 1913 the number of full professorships held by these 'psychologists' increased from one (i.e. Stumpf) to ten. According to the statistics of one contemporary witness, of the thirty-nine full professorships in philosophy in 1892, practitioners of experimental psychology held three; of the forty-two full professorships in 1900 they occupied six; while of the forty-four in 1913 they had already gained ten.

The number of proponents of psychologism exploded mid-century, but after its impressive rise, it fell out of prominence around the turn of the century; and this, for a number of reasons, some theoretical, and some sociological or political in nature. The institutional crisis in philosophy was ultimately averted, so the story goes, by the intervention of Frege, but especially of Husserl, whose arguments cemented the repute psychologism as an untenable position.[37] The canonical arguments that lead to the eventual downfall of psychologism were provided by Husserl in the 1900 *Prolegomena* to his *Logische Untersuchungen*, and in his 1911 *Logos* article "*Philosophie als strenge Wissenschaft*." As we have seen in the previous chapter, the father of the phenomenological movement rejected nearly every variety of naturalism, and he argued with particular vehemence against psychologism. By the 1910s, the arguments of Husserl's *Prolegomena* had become the battle cry of institutional philosophers. Proponents of psychologism were compromised theoretically and politically: through a series of (arguably political) events, Husserl's arguments against psychologism eventually won general favor.[38]

Psychologism was all but dead and buried, until its recent resurgence. Interestingly, the motivation of this resurgence parallels the initial motivations for psychologism: the decline and eventual fall of the foundationalism proposed by the defenders of logical empiricism. Quine's initial statement of naturalized epistemology and return to psychologism was mainly motivated by the palpable failure of the foundational projects

[37] Frege's attacks (1884; 1893) centered on the refutation of psychologism as a position arising in logic, i.e., that logic is reducible in some sense to psychology. Note that this is not the kind of psychologism at issue in debates over naturalistic epistemology today. As such, in what follows, I shall focus on Husserl's arguments against psychologism as a position arising in epistemology.

[38] These events are recounted in detail in Kusch (1995). Kusch argues, e.g., that the anti-scientist spirit of the Weimar Republic made it politically advantageous to adopt anti-psychologism, and lead to the rise of *Lebensphilosophie* over scientific philosophy. Kusch discusses a number of political events that had an incidence on the debate, notably the 1913 petition by "pure" philosophers against the appointment of psychologists in philosophy chairs.

in epistemology, such as the one proposed by Carnap in his *Der Logische Aufbau der Welt* (1928), to provide a philosophical justification of the doctrinal (truth- and justification-related) aspects of scientific investigation, which would could act as a foundation for all knowledge claims. For Quine, the failure of foundationalism entailed that, should philosophy still engage in epistemology at all, it ought to "settle for psychology" (Quine 1969, 75).

2. Naturalism and psychologism

We are thus confronted with a "new psychologism" today. This renewal of psychologism leads to a number of questions. Given the contemporary resurgence of psychologism, ought we to re-evaluate the validity of this position? Is psychologism worth pursuing today? But what did the specter of psychologism consist in? As we have seen, in the most general sense, what was called "psychologism" was the view that philosophy, and in particular logic and epistemology, in some sense, and to some degree, were either part of psychology or could be usefully complemented by psychology. But the term was used ambiguously: many heterogeneous positions were labelled psychologist, and the charge was nearly impossible to avoid, with accusers often being accused of the same.[39]

Discussing psychologism in general is a nearly intractable problem, so it might be worth our while to untangle some of the senses of the expression to allow for tractable discussion. This will allow me to focus my discussion to psychologism on a specific (if narrow) sense of the term, one directly relevant to the question of naturalistic

[39] As Kusch (1995, 4ff.; 95ff.; 108ff.) remarks, the accusation of psychologism arose in many fields: fields as diverse as metaphysics, ontology, epistemology, logic, ethics, but also aesthetics, sociology, religion, mathematics, pedagogy, and linguistics. This makes a discussion of psychologism in general an intractable problem, which motivates an analysis of specific components of the concept.

approaches to epistemology. As indicated, generally speaking, psychologism is defined as the view that traditional philosophical investigations ought to be replaced, or complemented, by empirical psychology. Psychologism, as I shall discuss it here in relation to naturalistic approaches to epistemology, is a species of naturalism. Now, naturalism is itself polysemous as well. In the previous chapter, I argued that naturalism can be read in three different ways: as a position arising in ontological, methodological, and epistemological domains.[40]

In the relevant sense, psychologism in philosophy is a form of naturalism, one whose source and target have been specified. That is, psychologism is a form of naturalism that specifies a source natural science of interest (i.e., psychology), from which it draws methodological insight, as well as a target discipline (i.e., epistemology), which is to benefit from the resources and methods of that science.[41] Psychologism, then, is the claim that a specific natural science, psychology, is relevant to epistemology, given a set of naturalistic ontological, methodological, and/or epistemological considerations.[42]

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[40] The following typology of naturalism was first presented in the first section of the previous chapter. Note that I have modified the position labelled "epistemological naturalism" for the purposes of the present discussion. As indicated, this typology of naturalism is indebted to Ayala's typology of reductionism (see Ayala 1974). The typology benefited from Zahavi's (2010) discussion of metaphysical and methodological naturalism in the context of naturalizing phenomenology as well. Note that the varieties of naturalism discussed here are not mutually exclusive.

[41] Although the primary focus of this chapter is epistemology, I think a similar case can be made for the relevance of psychology to philosophy of science. I shall at times draw on authors in the philosophy of science to argue for naturalistic epistemology. See Giere (2010; 1999; 1990).

[42] I am aware that this presentation of psychologism, to wit, as a species of naturalism whose target is epistemology (rather than, say, to logic), is partial. Husserl's anti-psychologism in epistemological matters was very intimately intertwined with his logical anti-psychologism, and both were rooted in his Platonist view on meaning. It might be argued that full exposition of psychologism would indeed require a joint account of its logical and epistemological aspects. One of my evaluators cogently remarked that Quine's project for naturalistic epistemology is, in effect, an endorsement of logical as well as epistemological psychologism. His notion of "stimulus-meaning" (Quine 1995) is an attempt to

In principle, I would argue, psychologism can be read as all of these ways (as a form of ontological, methodological, or epistemological naturalism). But not every reading of psychologism is equally relevant to the context of naturalistic approaches to epistemology today. Let us unpack a typology of naturalism and see how psychologism relates to each element in the typology.

First, ontological naturalism is a form of monism. Simply put, ontological naturalists hold that there exists one (and only one) kind of "stuff," which makes up all the sundry things in nature. This stuff is "natural" stuff—the kind of stuff assumed to exist by the natural sciences. We might state this as:

> Ontological naturalism: the position that all things and their properties are natural things and properties, or supervene on natural things and properties.

Ontological naturalists typically refer to the ontologies of the physical sciences (e.g., electric charge, mass, energy, etc.), but this is not always the case. Although many naturalists also endorse physicalism, the view that the fundamental ontology is provided by physics (i.e., that all things and properties are, or supervene on, physical things and properties), not all naturalists would endorse such a reductionist view, and might hold psychological things and properties as being equally fundamental (e.g., Fodor 1968; 1974). However, the ontological debate about ontological naturalism, while interesting in itself, is not really what is at issue in recent debates over naturalistic

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naturalize philosophy all the way down to meaning. In a sense, Quine bites the bullet: his psychologism is precisely what Husserl was criticizing. Yet Quine embraces the position and all that it entails. While these considerations are worthwhile to explore, I shall restrict my discussion to epistemological psychologism, given space constraints. However, we should keep in mind that this presentation is partial.

epistemology and psychologism.[43] Most protagonists in this debate are ontological naturalists, and differ with respect to their stance on physicalism (i.e., can all natural things and properties be reduced to physical things and properties), rather than on ontological naturalism *per se*. Their interests and worries lie elsewhere; ours will as well.

A variety of naturalism more relevant to our considerations here is naturalism as methodological. We might state this position as follows:

> Methodological naturalism: the meta-philosophical view that philosophical fields of inquiry (e.g. epistemology, ethics, metaphysics) should employ, or at least be coherent with, the methods of the natural sciences (such as the use of empirical experiments, the operationalizing of concepts, and so forth) and their criteria for justification (e.g., parsimony, simplicity, predictive power, reproducibility of results, etc.)

Methodological naturalists are not necessarily committed to any specific ontological views about the kinds of things that exist, but simply insist that philosophy ought to

[43] Moreover, a discussion of ontological naturalism would make the argument on offer intractable, given the extensive literature that exists on the question. The literature centers mostly on the debate between the advocates of reductionist physicalism and the partisans of non-reductionism. Non-reductionists argue that "higher-order" (i.e., biological or psychological) things and properties emerge from, and are ontologically distinct and autonomous from, physical things and properties. The many debates over the multiple realization of biological and psychological functions are also part of this constellation of considerations. See, e.g., Mitchell (2012); Kim (2006; 1999); Boogerd et al. (2005); Fodor (1997); Sober (1999); Stephan (1999); Schaffner (1967); Nagel (1961). The fact that ontological questions are not central to the debates over naturalistic epistemology contrasts strongly with the state of affairs in other debates, notably the one on the nature of consciousness and the "hard problem"; see, e.g., Chalmers (1995).

adopt, or at least minimally cohere with, the various methodologies adopted by the natural sciences.[44]

Another relevant form of naturalism for our purposes arises in the epistemological domain. We might label as epistemological naturalism the following view:

> Epistemological naturalism: the position that the only valid and justified form of knowledge is empirical knowledge, knowledge pertaining to natural things and properties, and natural nomological regularities

The epistemological naturalist holds the view that knowledge is only justified in as much as it results from empirical investigations. When applied to epistemology (as target field), the claim is that epistemological statements themselves are only valid and justified insofar as they pertain to natural things and properties.[45] We might nuance the view, and introduce two variant positions. A strong reading of epistemological naturalism might be stated as follows:

> Strong epistemological naturalism: the position that for any field of study to qualify as a bona fide scientific enterprise providing a legitimate form of knowledge, that field must provide empirical knowledge about natural nomological regularities and particulars.

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[44] In the previous chapter, I argued that one of the most prominent opponents of psychologism, Husserl himself, did not outright reject the naturalistic methodologies, but allowed for their use in a limited setting, provided they did not overstep their role and stay far from epistemological questions.

[45] We can imagine a theorist who would endorse epistemological naturalism for empirical scientific claims, but not for epistemology itself. This is possible if one rejects the claim that epistemology is in the business of producing knowledge and endorses, e.g., the view that it is a kind of therapy, as Wittgenstein suggested.

Strong epistemological naturalists want to reduce all forms of knowledge to empirical knowledge. When applied to epistemology, this would mean that all our knowledge about our knowledge ought to pertain to natural nomological regularities and particulars, lest it be meaningless or vacuous. Such extreme positions are today few and far between. With a few exceptions, most would be inclined to endorse a weaker, more moderate form of epistemological naturalism, which we might put as follows:

> Weak epistemological naturalism: the position that for any field of study to qualify as a bona fide scientific enterprise providing a legitimate form of knowledge, that field must provide empirical knowledge about natural nomological regularities and particulars at some point in its argument; however, that field might employ other forms of knowledge as well, such as formal knowledge about logical and mathematical entities, structures, and relations.

Applied to epistemology, weak epistemological naturalism is the claim that epistemology ought to, at some point in its reasoning, appeal to natural things, properties, and regularities, given certain of its questions or interests. This is a much weaker form of epistemological naturalism, because it does not reduce the field at issue (in our case, epistemology) to a province of the natural sciences. But it is still a form of naturalism: it is still consistent with the idea that fields in philosophy ought to produce knowledge that, at some point in the argument, refers to natural things, properties, and regularities.

Psychologism as a species of naturalism

So much for naturalism. How does this relate to the issue at hand? As discussed, psychologism is a form of naturalism whose source and target have been specified. First, psychologism is a species of naturalism appealing to a specific science, namely

psychology, for clarification in philosophy. Second, psychologism is a form of naturalism whose target discipline is epistemology. As we discuss it, psychologism is not a general meta-philosophical view that naturalistic psychological considerations ought to apply to all of philosophy (i.e., logic, metaphysics, ethics, etc.), but strictly to epistemology. So the general claim of psychologism is that epistemology ought to be informed by psychology, or simply replaced by scientific psychology, by a psychology that uses the descriptive framework of the experimental sciences.

How does this tie into our typology of naturalism? Psychologism, I would argue, is necessarily a form of methodological naturalism, because it claims that epistemology ought to employ, or at least be coherent with, the methods of empirical psychology to answer its specific set of questions. A proponent of psychologism will minimally want to claim that the methods specific to psychology are of epistemic relevance to questions raised in epistemology. But she may not want to claim that all kinds of knowledge necessarily relates to natural/formal things, properties, and regularities. We can provide two varieties of psychologism, which index the two variants of epistemological naturalism introduced above, and which might allow finer, more relevant distinctions to be made. A first, maximal version of psychologism, might be defined as follows:[46]

> Strong (or replacement) psychologism: the position that epistemology is a part of psychology; it does not have any legitimate claims to autonomy from psychology.

This strong form of psychologism is the view initially defended by Quine in his 1969 paper (and later by thinkers such as Churchland): it is a statement of his (in)famous "replacement thesis" about epistemology. On this reading, epistemology best be

[46] The qualifiers of psychologism that I employ, "replacement" and "collaborative," are those usefully proposed by Feldman (2001) to describe naturalism. Feldman also discusses "substantive" naturalism, which I do not address.

replaced by psychology. Methodologically, the maximal claim is that epistemology would be better off simply to use the empirical, experimental methods of psychology and limit armchair theorizing to the heuristic role it serves in science. Epistemologically, the maximal claim is that epistemology is nothing more than a part of psychology: its claims are only legitimate insofar as it makes reference to psychological laws, processes, concepts, and regularities. A partisan of strong psychologism can justify his methodological commitments by pointing to his epistemological commitments: if all knowledge is essentially empirical knowledge, then to employ the methods of the natural sciences, especially psychology, in epistemological investigations is almost common sense.

However, for many, the maximal position is too strong. We might then define a weaker version of psychologism, which combines methodological naturalism with the weak version of epistemological naturalism, as follows:

> Weak (or collaborative) psychologism: the view that epistemology would greatly benefit from a rapprochement with psychology, where a rapprochement means: to draw on psychology for its concepts, laws, methods, and theories, or to make sure that epistemology is coherent with its concepts, laws, methods, and theories.

On this weaker reading, epistemology is not best replaced by psychology, but rather, can be complemented by psychology given certain of its interests. This variety of psychologism is also a form of methodological naturalism, as it claims that some of the questions relevant to epistemology are best approached by the methods of psychology. But it is not committed to the strong version of epistemological naturalism, as it acknowledges that, although the methods of psychology can provide illumining answers to epistemological questions, there are some questions in epistemology that might not be best addressed by psychology. Such a thinker can justify her methodological commitments pragmatically, as Giere (1999, 69ff.) has suggested,

following the great American naturalists Dewey and James. In short, on the weak, collaborative reading, the claim that psychology is methodologically and epistemically relevant to the field of epistemology does not entail the claim that that epistemology can be reduced to a province of psychology.

Having defined psychologism, we can contrast both variants with anti-psychologism, a maximal claim that can be phrased as follows:

> Anti-psychologism: the position that epistemology is independent of any claims made by psychology

Husserl is perhaps the best known advocate of anti-psychologism. Given that we have seen his arguments against naturalism and psychologism in some detail in the previous chapter, I only will briefly summarize these arguments here, insofar as they concern methodological and epistemological naturalism.[47] Husserl rejected naturalistic methodologies in philosophy because he held that philosophy had (and indeed, ought to have) its own irreducible, independent set of methods. For Husserl, these autonomous methods were the "transcendental reduction" and the "eidetic reduction," which allowed the phenomenological philosopher to change her attitude towards her own direct lived experience, and describe it as it welled up in the flux of conscious experience. Husserl also rejected the epistemological implications of naturalism. He held that there was an irreducible domain of knowledge, that is, "material *a priori*" knowledge, which was neither reducible to empirical knowledge about states of affairs, nor to formal *a priori* knowledge such as mathematics and logic. Indeed, epistemology need not make any reference to the natural sciences at all, on his account. The domain

[47] A much fuller exposition of Husserl's arguments against psychologism in the *Prolegomena* can be found in Kusch (1995). Also see Moran (2008) for a discussion of the evolution of Husserl's arguments with respect to psychologism and naturalism.

of the material *a priori* was an independent domain, disjoint from the factual domain, and accessible only to the gaze of the phenomenologist who practiced the reductions.

Psychologism, argued Husserl, necessarily lead to relativism, and was a viciously circular attempt to provide the sciences with a foundation. Psychologism led to relativism, he argued, because it entailed that truth was relative to the constitution of the organism experiencing it. For Husserl, this was nonsense, because truth is necessarily absolute: something is either true or it is not. Worse still, psychologism was a fundamentally flawed doctrine, as it necessarily led to a vicious circle of reasoning with regard to the foundation of science. It would be nonsense, he believed, for the sciences to propose their own normative principles. Norms, after all, on his view, are not facts to be discovered by some naturalistic investigations, but rather must be established on the basis of sound philosophical argument.[48] The sciences presuppose proper epistemological work, which allows them to justify their knowledge claims.

Now, as we have seen, the foundational considerations that motivated Husserl's own brand of anti-psychologism have all but disappeared from the contemporary philosophical landscape. But critics were plentiful even at the time he penned his arguments.[49] Sigwart (1904), Schlick (1910), and Maier (1914), for instance, claimed that Husserl conflated truth with reality. With these distinguished, it became possible to argue that although truth, insofar as it is correlative to a judgment, is relative to the individual judging and her psychological constitution, matters of fact are not. This view allowed them to resist to accusation of relativism: truth may be relative, but the matter

[48] For Husserl, the norms of scientific practice were to be delivered by a "pure logic," that is, a general theory of scientific theories. The laws of pure logic could then be transposed as normative laws for the individual sciences. See Husserl (1900), chapter XI.

[49] Again, see Kusch's excellent 1995 for an extensive report of these criticisms, especially pp. 63ff. I base the discussion in this and the next paragraph on Kusch's study, and I am greatly indebted to his fine work.

of fact is independent of epistemic agents, and provides us with a firm grounding to our knowledge claims. Jerusalem (1905) and Palágyi (1902) argued similarly against Husserl's absolutist theory of truth, contesting the idea that psychologism lead to relativism in a negative sense.

Concerning vicious circularity, a significant number of Husserl's contemporaries (e.g., Jerusalem 1905; Cornelius 1906; Stumpf 1907; Rickert 1909; Meinong 1913) actually returned the accusation of psychologism against him. In his *Prolegomena*, Husserl had argued that his phenomenological method was a form of descriptive psychology. In a sense, according to his critics, Husserl was proposing to ground all sciences in a form of psychology, despite his own vocal rejection of psychologism.[50] This criticism might have defused Husserl's accusations of relativism, were it not for the political and social contexts, which fostered anti-psychologism. But the point holds: Husserl's arguments against psychologism met with probative resistance from his contemporaries, and this resistance might incite us to look into psychologism today and re-evaluate its relevance.

[50] Stumpf (1939-1940, §13) argued that Husserl unjustifiably lumped together the three "neutral sciences" in his phenomenological project, and in so doing, made the nuanced consideration of the relations between them and the natural sciences impossible. See Fisette (2015) for an illuminating discussion. It is probably this line of criticism, which turned the accusation of psychologism back on him, that motivated Husserl's famous "transcendental turn" of phenomenology. As Romano (2010, 508ff.) recounts, in a letter to Hans Cornelius from 1906, Husserl writes that one of the chief motivations behind his turn to a pure epistemological subject was the realization that psychology, even descriptive and immanent, was not in a position to provide a foundation for the sciences, because it was, itself, a science. Husserl's arguments against naturalism and psychologism are based on his specific conception of evidence, which differs significantly from the contemporary conception. See Heffernan (1998; 1999) for a thorough discussion.

3. The new psychologism and epistemology

As indicated above, the "new psychologism" rose in response to the failure of foundational projects in epistemology, much like the old psychologism rose from the ashes of German Idealism. The calls for a "naturalized epistemology," however, rest on a transformation of how we think of epistemology today. I argue that the major changes in the epistemological landscape today can be seen as the index of changes in how we think about epistemic agents. Increasingly, today, epistemological projects are interested in the epistemic capacities of what we might call the "concrete epistemic agent." This is far removed from the study of knowledge in the abstract, which dominated logical empiricism, or again from the investigations into the epistemic faculties of a "pure" or "transcendental" subject. As Bechtel and Richardson (1993, 3ff.) have remarked, contemporary epistemology has blurred the line between the contexts of discovery and justification, such that epistemologists and historians of philosophy today are increasing concerned with factors that were once considered "external" to the practice of epistemology. One of the central factors is arguably the epistemic capacities of the actual, concrete agents of knowledge and scientific discovery.

Consider Kuhn's famous 1962 study on the structure of scientific revolutions. Kuhn's pioneering work brought sociological and historical considerations to the fore, situating the epistemic agent, and indeed the progress of science itself, in a network of concrete historical factors: he was looking to establish "a role for history" in philosophical accounts of knowledge. Kuhn considered many capacities of epistemic agents that had been neglected (or exorcized) up to that point, such as the capacity to make up one's mind between two competing theories, and he went on to analyze how factors like peer affiliation, or personal commitment to an idea, figure importantly in how the scientific landscape evolves over time. Kuhn thus displaced the interests of epistemology in two

ways: he historicised its subject matter, and situated his reasoning at the level of the capacities of historical agents and communities of such agents.[51]

Think also of the neuro-philosophical project, pioneered by P. M. Churchland (1989; 2007) and P. S. Churchland (1986; 1987).[52] Neuro-philosophers adopt a "biological perspective" on epistemology (Churchland 1987, 546), and similarly to Kuhn, they situate the concrete epistemic agent and her scientific practices in the concrete context of finite biological existence, that is, in evolutionary time. Churchland argued that epistemic capacities such as learning, had by epistemic subjects, are not indifferent to our philosophical accounts of knowledge, and ought to be considered by epistemologists. Thus, the question "How is it possible for us to represent reality," which was arguably the central philosophical question since Plato, becomes, in the context of the new epistemology, "How, situated within its bodily configuration, with its surrounding physical environment, and within the social context it finds itself, does the brain work" (Churchland 1987, 546). Epistemology has a new face—and a body, and a history.[53]

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[51] Although, technically, Kuhn's project is one in the philosophy of science rather than epistemology in the strict sense, I believe his arguments have implications for the theory of knowledge in general.

[52] The point of referring to Churchland here is not to directly claim that epistemology ought to be interested in cognitive science. That would obviously be begging the question. I am only illustrating the idea that contemporary epistemology is interested in the capacities of concrete epistemic agents. Of course, my argument will conclude something similar to the thesis espoused by Churchland, but at this stage, I am not directly making the argument for the relevance of cognitive science.

[53] This shift in interest towards concrete capacities of subjects is also related to the shift in thinking in ethics inaugurated by Nussbaum (2000; 1988) and the capabilities approach she proposes. Rather than focusing on abstract human rights, Nussbaum and her collaborators propose to focus ethical debate on the concrete capacities had by ethical agents. This is in line with the recent change in thought over the focus of epistemology we have just discussed. What is central to contemporary discussions is arguably the capacities or capabilities of the concrete agents that concern us, be it in epistemology or in ethics.

These new conceptions of epistemology, focused as they are on the concrete epistemic agent and her capacities, rather than on the abstract subjects of epistemic faculties, are so common today that they are often presented without argument. So epistemology today is at least interested, among other things, in the epistemic capacities had by concrete epistemic subjects, which have a history, a culture, and a body. This is the new understanding of epistemology, and although it is still not the standard, traditional view, if correct, it entails a change of focus in the type of question asked in epistemology. It entails, minimally, the deliberate, if occasional, consideration of the concrete capacities had by epistemic agents when studying knowledge and justification in epistemology.

Historically, this focus on concrete epistemic subjects has gone hand in hand with the rejection of *a priori* foundationalism.[54] In its maximal expression, the claim is that if there is no ultimate foundation for scientific knowledge claims, the best we can do is study how actually existing epistemic agents acquire knowledge (e.g., in strong or replacement psychologism). We might instead suggest, on a weaker reading of the claim, that epistemology ought to be interested in epistemic capacities among other things (e.g., in weak or collaborative psychologism). In either case, the guiding metaphor for the epistemic process of acquiring knowledge about the world is Neurath's boat, constantly rebuilt at sea along its voyage: our epistemology enables our scientific investigations and also changes in tandem with it, as we learn more about who we are as epistemic agents.

[54] The rejection of foundationalism and the turn to the capacities of concrete epistemic subjects are not logically entailed by one another, but rather emerge together in a complex tapestry of theoretical options. Both might reflect underlying commitments of contemporary epistemology, but it is logically possible to endorse one without the other. We can imagine, for instance, a kind of foundationalism that aims to ground all knowledge claims on the capacities of concrete epistemic subjects.

4. The psycho-epistemological argument: an outline and stepwise justification

In the previous section, we examined psychologism in light of the recent debates over naturalistic approaches to epistemology, and we identified two varieties of the position. The strong or "replacement" version of psychologism is a combination of methodological and strong epistemological naturalism, and is the view according to which epistemology reduces to part of psychology. The weak, "collaborative" version advocates methodological naturalism as well, but is committed only to weak (rather than strong) epistemological naturalism, calling for collaboration epistemology with the sciences of the mind, rather than replacement. We contrasted both positions with anti-psychologism, the view that epistemology has nothing to learn from empirical psychology, and discussed Husserl's arguments. Husserl emphatically rejected psychologism in epistemology because he believed that it led necessarily to relativism, and that it was a viciously circular attempt to provide a firm foundation for the sciences. We reviewed some of the responses of his contemporaries and drew the conclusion that Husserl's arguments were not impervious to critique. Having made these distinctions, we have seen that rather important changes in the conception of epistemology have altered the philosophical landscape, in at least two ways. First, the failure of logical empiricism marked the end of attempts to provide apodictic, absolute, *a priori* foundations for the sciences: the project of foundationalism seem to be dead (necromancy aside). Second, epistemology is increasingly concerned with the capacities of concrete epistemic agents, that is, with the capacities of finite, historical, encultured, and embodied epistemic agents, rather than with the abstract, "pure," or "transcendental" subject of epistemic faculties.

With this backdrop secured, I proceed to making a general argument in favor of what I have called weak psychologism in this section of the chapter. This psychologistic (or again, as I prefer to put it, psycho-epistemological) argument is an attempt to justify

the claim that some of the investigations carried out in cognitive science are directly relevant to the questions raised in epistemology.

The psycho-epistemological argument has five steps. (1) The first is to claim that epistemology is interested in, or at least concerned with, a specific world-disclosing capacity, labelled *C**, had by concrete epistemic agents. I support the claim by referring to projects in contemporary epistemology, and discuss the central terms in the claim. (2) Next, I consider whether an explanation can be provided for this capacity by a given branch of cognitive science. I argue that such an explanation can be provided in at least two different ways: (i) by functional analysis and decomposition, and (ii) by mechanistic analysis. The second step considers the idea that epistemic capacities can be analyzed by specifying a "terminal parameter," which allows us to approach the capacity from a design or engineering perspective. This opens onto at least two kinds of analysis, functional and mechanistic, for the relevant capacity. (3) The next claim is a relatively uncontentious one about explanation and the epistemic relevance of capacities in general, to the effect that if a given discipline explains a capacity *C* that is epistemically relevant to another discipline, then the latter discipline ought to be informed by the former. This step is crucial, because it provides the link between the first two claims, which are factual, and the conclusion, which is normative. (4) Finally, the argument moves to a conditional conclusion, contingent on accepting the first premise: that if an epistemic world-disclosing capacity *C** is epistemically relevant to epistemology, then epistemology ought to be informed by those sciences that study the functional organization and neural implementation of *C**.

The psycho-epistemological argument itself is as follows:

> (1) An epistemic world-disclosing capacity *C**, which is characteristic of concrete epistemic agents, is epistemically relevant to epistemology (among other things)

(2) There exists some cognitive science N, such that N can provide an explanation of the relevant epistemic world-disclosing capacity C^*, by functional analysis/decomposition of C^* into organized operations $f \in F_{C^*}$, and/or by mechanistic analysis of C^* into cognitive mechanisms $m \in M_{C^*}$ (among other things), or both

(3) For any two disciplines D_1 and D_2 (e.g., epistemology and cognitive science) and a given capacity C (e.g., C^*): if C is epistemically relevant to D_1 and C is explained by D_2, then D_1 ought to be informed by D_2

(4) If C^* is epistemically relevant to epistemology, then epistemology ought to be informed by N.

At the outset, I ought to address a potential failing in the above argument. It might be argued that I am committing the naturalistic fallacy, by moving from factual premises to a normative conclusion. Indeed, I am moving from claims about the interests of epistemology, as well about the possible explanation of epistemic capacities by cognitive science and their epistemic relevance to epistemology, all of which are arguably factual claims, to what seems like a distinctly normative claim about what ought to inform or interest epistemology. How does this not commit the naturalistic fallacy, that is, the fallacy of deriving an "ought" from an "is"? Given this preliminary problem, it is probably best to discuss claim (3) first, and then examine in the other claims in order. Now, the claim that allows us to move from the factual to the normative is the following:

4.1. (3) For any two disciplines D_1 and D_2 (e.g., epistemology and cognitive science) and a given capacity C (e.g., C^*): if C is epistemically relevant to D_1 and C is explained by D_2, then D_1 ought to be informed by D_2

This claim is the one that links the factual claims in the psycho-epistemological argument with the normative import of the cognitive sciences to epistemology, and allows us to avoid committing the naturalistic fallacy. One way to avoid charges of committing the naturalistic fallacy is by approaching epistemic normativity as a question of rational epistemic action concerning to the best way to reach a given end given the means that are available. The normative status of claim (4) pertains to the achievement of a specific kind of goal, an epistemic goal, given a set of conditions and possibilities for epistemic actions to realize the goal, and this passage from the factual to the normative modality happens in claim (3).

In terms of action theory, we can argue that this claim is an application of a more general principle of rational action to epistemological matters, which could be stated as follows: if, in conditions X, an agent S aims to achieve an objective O, and if, in conditions X, action A allows S to achieve O, then S ought to do A. In our specific case, the claim is about rational epistemic action: that if, in conditions X, an epistemic agent S aims to account for some capacity C^*, and if, in conditions X, to be informed by a cognitive science N allows the agent to provide an explanatory account of this capacity, then S ought to be informed by N. To address the question of normativity in this way makes it a special case of rational action in general. Normativity, present in the modality "ought to be informed by...," here appears as a link between what an agent aims to do and the means through which she can accomplish what she aims.

From this, claim (3) follows naturally, as it generalizes the aforementioned principle of rational epistemic action from epistemic agents to disciplines. The claim is simply that

for any two disciplines D_1 and D_2, say, epistemology and cognitive science, and a given generic capacity C, the following must hold. If it is the case that C is epistemically relevant to D_1, and it is also the case that C is explained by D_2, then given what we have just discussed in terms of epistemic rational action, it follows that D_1 ought to be informed by D_2. More directly, if cognitive science explains a generic capacity that is of epistemic relevance to epistemology, then epistemology ought to be informed by cognitive science.

Outside of action theory, there are other ways to cash out the idea that factual premises can lead to normative claims given a set of goals, this time as goals implicit in the struggle for survival. We might consider naturalistic approaches to normativity, and specifically viewing epistemological prescriptions as cases of functional normativity.[55] What does this mean? Since the advent of Darwin, biological thinking has attempted to naturalize normativity, and has done so quite productively. For instance, natural selection, as is now commonplace, largely explains the (apparent) teleology and normativity of biological systems. Normativity in this sense is a recurrent feature of many approaches in philosophy of mind and biology, and is well illustrated with Millikan's (1984, 1989) notion of a "proper function." As she puts it,

> for an item A to have a function F as a [non-derived] "proper function," it is necessary (and close to sufficient) that... . A originated as a "reproduction" (to give one example, as a copy, or a copy of a copy) of some prior item or items that, *due* in part to possession of the properties reproduced, have actually performed F in the past, and A exists because (causally historically because) of this or these performances. (Millikan 1989, 288)

[55] Note that the two accounts of normativity on offer are not mutually exclusive. Both of these explanatory accounts of normativity are of the design or engineering kind. In the first case, the designer is the human epistemic agent seeking to better the practices that allow her to acquire knowledge; in the second, the "designer" is simply natural selection "attempting" to "make" organisms better able to survive and reproduce in their environment. Arguably, both accounts might usefully contribute to understanding epistemological normativity.

This is where normativity comes in. First, items can fail to achieve their proper function; the latter have an apparent teleological aspect and, and that basis, a kind of normativity that relates to aims. Human vision, for example, can fail to adequately represent an object in certain conditions. This possibility of failure implies a kind of normativity: proper functions can be carried out successfully or unsuccessfully, and this provides them a kind of normativity. We might consider the successful operation of a proper function as a kind of "normative" aim for the system: the system "ought" to do this or that if the "goal" of vision (that is, adequately representing the visual scene) is to be realized.

Second, the successful performance of a function depends on "normal conditions," conditions in which the function can be realized, to obtain the result it was selected for (e.g. Darwinian reproductive success). Human eyes, for instance, can act as proper transducers of visual information, that is, can convert physical light energy into neural impulses, only given certain specific constraints or norms. In this case, the normal conditions include adequate (not too intense) ambient luminosity, healthy retina function, absence of pathology (such as cataracts), and so forth. There are thus very specific conditions in which a function can be carried out, and these conditions can be seen as normative. They are the conditions that the system "ought" to be in for the function to be carried out. Similar considerations apply to most other biological systems.[56] Thus, we have a kind of "engineering" or "design" conception of

[56] The "enactive" approaches to biological and cognitive systems make a central point of normativity in this design sense. They make a case for considering the "intrinsic purposiveness" of biological systems in cognitive science (see, e.g., Thompson 2007, 133ff.). On the enactive reading, organisms dynamically make sense of their environments in a continuous process of co-constitution of self and world. This "sense-making" activity stems from specific, bodily dispositions that are characteristic of the perspective of the organism, and this perspective is a kind of normative ground for cognition Organisms thrive in precarious conditions. The struggle for continuous existence in a far-from-equilibrium state entails that the conditions allowing for the continuous steady-state existence the organisms act as a kind of

normativity, where design considerations pertaining to the carrying out of a specific function furnish the motivation for this or that norm. These statements straddle the middle line between the factual and the normative: they are factual because they are grounded in how the system is in fact constituted, but they are normative insofar as they provide conditions for the system's achieving this or that design goal.

We might argue that naturalistic approaches to epistemology need only appeal to "engineering" accounts of normativity: this is a claim about the rationality of epistemic action or about biological normative constraints. So claim (4) does not commit the naturalistic fallacy, because it states little more than that epistemology ought to heed to the results of psychology insofar as they have a specific goal, to account (among other things) for epistemic capacities of concrete agents. This is a claim about the aims of epistemology, and about how best to achieve those specific aims. Quine goes in this direction when he says that his naturalistic approach to epistemology does not merely reduce normativity to brute fact:

> Naturalization of epistemology does not jettison the normative and settle for the indiscriminate description of ongoing processes. For me *normative epistemology is a branch of engineering*. It is the technology of truth-seeking, or, in a more cautiously epistemological term, prediction. Like any technology, it makes free use of whatever scientific findings may suit its purpose... The *normative* here, as elsewhere in engineering, *becomes descriptive when the terminal parameter is expressed*. (Quine 1997, 665, emphasis added)

Contemporary naturalistic projects in epistemology provide a kind of engineering accounts of the aims of that discipline. Quine's and Millikan's proposals to naturalize

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normative constraint on the organism. One of the merits of the enactive approach to cognition is to have reintroduced the idea of normativity, and a kind of naturalized teleology, in cognitive science. For a clear introduction to these ideas, see (e.g.) Varela, Thompson, & Rosch (1991); Weber & Varela (2002); Thompson (2007); Di Paolo (2009); Froese & Di Paolo (2011); Di Paolo & Thompson (2014).

normativity are operative only insofar as a "terminal parameter" has been established, either by the engineer or by natural selection. What is meant by a terminal parameter in this sense is just the end result of a function that can be maximized or minimized given certain constraints. In summary, the approach outlined by Quine allows us to take a given normative capacity and then to treat it from a design or engineering perspective by specifying the terminal parameter that this capacity is supposed to realize.[57] The design perspective can be thought of either in terms of action theory and rational epistemic action, or again in terms of naturalized normativity, given the constraints on living systems in evolutionary time. Now that the major caveat has been dealt with, we can move to the justification of the other main premises in the argument.

4.2. (1) An epistemic world-disclosing capacity *C**, which is characteristic of concrete epistemic agents, is epistemically relevant to epistemology (among other things)

The first step of the psycho-epistemological argument is to identify one specific epistemic capacity had by concrete human agents that is of epistemic relevance to epistemology, that is, a capacity the carrying out of which matters to epistemological

[57] To illustrate this design sense of normativity further, consider the emerging "predictive processing" or "free-energy principle" approach to cognitive systems (see, e.g., Clark 2013; Hohwy 2013, Friston 2010). Such approaches view cognitive processes as bidirectional cascades of information processing, where top-down connections between neurons relay predictions coming from generative models. These predictions actively try to cancel out or "explain away" the prediction errors picked up by dedicated "error units," either by changing the generative model that made the predictions, or through action. In such models, the cognitive system has access to a mathematically specifiable quantity, namely prediction error (which is a mathematical upper bound on the system-inaccessible information theoretic quantity "surprisal"), which the system minimizes in order to gain a firm perceptual and motor grasp on its surrounding. In such models, the minimization of prediction error can be seen as a terminal parameter for the activity of processing information. We can move from an abstract capacity perspective to a design or engineering perspective by specifying such a parameter, and find the ways the system actually does minimize prediction error to realize its perceptual and motor feats. Thus, minimizing prediction error is design-normative in predictive processing approaches.

accounts of knowledge and scientific reasoning. A few remarks ought to be made with regard to the object and scope of this claim. The first clarification, discussed above, is that we are working with a new, perhaps nonstandard conception of epistemology. In the account we adopted, epistemology is interested in knowledge, rationality, justification, and the capacity to construct scientific theories, but not only in the abstract: it is interested more specifically (and among other things) in the knowledge, rationality, and justificatory practices of concrete epistemic agents, that is, of historical, embodied, and encultured epistemic agents.

This claim will make or break the argument for many. I suspect it will be the claim that generates the most resistance from "traditional" epistemologists.[58] Nonetheless, it still seems correct to claim that contemporary epistemological projects are no longer exclusively interested in studying the faculties of formal or disembodied subjects.[59] "*A*

[58] Kim (1988), for instance, argues that Quine's conception of epistemology in effect evacuates many of the questions that are central to epistemology. These questions relate to the relation of epistemic support or justification between our beliefs about the world and the evidence to which we are privy. On Kim's account, Quine's proposal replaces these questions of justification with questions surrounding the causal relation between the way we acquire sensory information and the way beliefs are formed. Kim and Quine are, then, in a sense, talking past each other, because they do not seem to be talking about the same set of problems and questions. We might respond to Kim's critique as Quine has, by arguing that the distinction between relations of epistemic support and relations of causal inference can be mitigated by the engineering or design stance. It might be argued that in so changing the question, the issues of justification become amenable to explanation, given a terminal parameter. I might further argue that the aim here is not to outright replace traditional epistemological questions, but only to examine other relevant questions concerning the makeup of epistemic agents (that is, to advocate collaborative psychologism rather than replacement psychologism).

[59] Of course, those who espouse the more idealistic aspects of Husserl's transcendental-phenomenological project, centered as it is on uncovering the invariant structures of "pure" consciousness, would be rather disinclined to accept this precision on the first premise. I would reply to the Husserlian that it is utterly unclear to me how one can adequately move from the study of "pure" consciousness to the study of how beings such as ourselves acquire knowledge about our worlds. The problem with "bracketing" the natural world, as it were, in the transcendental and eidetic attitudes is that it seems to relegate our epistemological investigations to the rarified level of pure consciousness, without any possible way back to our concrete living practice of science.

priori foundationalism is dead," we might say dramatically (knowing full well, of course, that necromancy is common philosophical practice), as are the myriad epistemologies grounded in disembodied, abstract epistemic subjects. The minimal interpretation of this claim is such that epistemology, as it stands today, is an attempt to account (among other things) for how concrete beings such as ourselves, embodied, historically and culturally bound epistemic agents, having finite cognitive resources, manage to acquire knowledge about the world and conduct scientific activities.[60]

A related precision concerns what I mean by an "epistemic world-disclosing capacity." By this expression, I mean a capacity had by an epistemic agent that allows her to acquire knowledge about her world or about herself. In the new conception of epistemology we have adopted, to account for such capacities is necessary (although, given the weak reading of psychologism on offer, not sufficient in itself) to providing an exhaustive account of knowledge. We have many such capacities. Consider a candidate capacity *C**: that of being in a world-disclosing, intentional, and interpretive relationship with the world. Intentionality in philosophy of mind is a property of experience that we might call also "aboutness." That is, intentionality pertains to the fact that our mental experience has content, is about something.[61] I do not just see, rather I see things, people, places, and all of these mental states are *about* something in the world. Put simply, in everyday experience, our experience is such that it is about things in the world. It is inherent to organisms such as ourselves that we are capable of having such an intentional relation with the world "out there." Intentionality, as a

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[60] In any case, the remainder of the argument rests on accepting this premise. Of course, more "traditional" epistemologists (e.g., value epistemologists) might reject this claim, in which case the argument will fail for them. But the argument thus formulated, in that case, at least has the advantage of pointing out the specific premise that generates disagreement, which is useful for debate.

[61] Franz Brentano is the first to have introduced the term intentionality, which he borrowed the Medieval Scholastic philosopher Thomas Aquinas. For Brentano, intentionality is the mark of the mental: psychic phenomena are defined by their being about something. Husserl would later make intentionality into one of the central concepts of his transcendental phenomenology.

central trait of our capacity for having a world-disclosing experience, is relevant to epistemology insofar as the possibility of acquiring knowledge about the world supposes that organisms such as ourselves can entertain states of mind about the world.

Interpretation is another capacity that might be relevant to epistemology. Arguably, the capacity to interpret or make sense of the world is a central, necessary part of our meaningful relation with the world. World-disclosing experience is the result of interpretation: our experience is laden with processes of interpretation, which yield not mere phenomenal experience *per se* (qualia, or whatever), but also an understanding of that which we perceive as being such and such.[62] Several lines of argument converge on this idea that experience is interpretation-laden. A straightforward argument to this effect comes from Gibson's influential "ecological approach" (1979) in psychology. Gibson argues that we apprehend things in the world as laden with what he calls "affordances," or possibilities for action. When I perceive a chair, for instance, I do not perceive it merely as a physical thing with given properties, say, size, shape, mass, etc. Rather, I perceive it as "sit-uponable," as something I could sit on, that is, I interpret it as something that affords action. My experience of things in the world, as those things, is the result of interpreting them as affording this or that possibility for action, and so is my knowledge about those very things. Experience and knowledge of things is contingent on interpretation: interpretation is part of what it is to have the capacity for

[62] Although there is still debate about whether there can be so called "pure," or "pre-conceptual" states of consciousness, that is, whether there is such a thing as a perceptual "given," it is uncontroversial to assert that our world-involving states of conscious perceptual experience are laden with understanding. Although it may be the case that conscious states of experience may not about anything, it seems reasonable to argue that insofar as consciousness is consciousness *of something* in particular in the world, then consciousness proceeds on the basis of interpretation. That is, we do not experience an indistinct and diffuse conscious state, but we experience things *as things*, as these particular things, which requires interpretation.

a world-disclosing experience.[63] Other capacities had by concrete epistemic agents might also be epistemically relevant to epistemology. We might want to study, say, how it is that agents manage to form true beliefs, track truth, or to justify beliefs in light of new evidence. All such world-disclosing capacities, insofar as they allow an agent to disclose and come to know their world, and as such are relevant to epistemological projects, are included under the extension of *C**.

The claim here, then, is that some epistemic world-disclosing capacity, which I generically label *C**, is of epistemic relevance to epistemology. This follows from our proposed reading of epistemology, as that discourse which studies knowledge and how we acquire it, and accounts for how it is that we can formulate and test scientific theories and hypotheses.[64] For instance, we have the capacity for intentional, interpretive relations with the world, and this capacity seems epistemically relevant to epistemology, insofar as epistemology accounts for how concrete epistemic agents acquire knowledge. The intentional component of the capacity is crucial because it

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[63] Other lines of argument converge on this idea. In his language of thought hypothesis, Fodor (2008), for instance, suggests that perception consists in the tokening of a term in "mentalese," the language of thought. Thus, whenever I perceive a particular, I am always perceiving it as an instantiation of a concept, lest I not perceive the thing at all. The argument, then, is that to perceive something is necessarily to perceive something *as* that thing, as the token of a mentalese term. Dennett (1987; 2013) has also argued something along these lines in his discussion of the different stances and their relation to Gibsonian affordances. What we apprehend, when we deal with the many phenomena around us, depends in large part on our attitude or stance towards these phenomena. When I interact with a person, I am obviously not in the same stance as when I interact with an inanimate object: I expect the person to have beliefs and intentions, to reply, to agree or disagree, and so forth (which I ordinarily do not for inanimate objects). My very apprehension of a person as a person is thus, in a sense, coextensive with my capacity to interpret my experience in a specific way. The same could be said for all things one might encounter in the world: my apprehension of an object relates to my attitude and expectations (and indeed, my expectations about my expectations) regarding that object in the world. Arguments to this effect could be made from hermeneutic and phenomenological philosophy, but space constraints prohibit me from unfolding this complex tapestry.

[64] We should note, however, lest we be accused of question begging, that if one disagrees with such a construal of epistemology, one will probably not agree with this claim. As indicated a number of times already, the argument on offer is contingent on accepting the first premise.

underlies our ability to come into contact with the world, which is necessary if we are to know about it, or test our models, theories, and hypotheses about it. The interpretive component is just as crucial, because it is necessary for going about acquiring information about specific things in the world, for grasping things in the world as such. There could be no acquisition of knowledge, and *a fortiori* no science, if we could not interpret our experience, models, and data as being about this and that specific state of affairs.

Finally, it should be pointed out that the aim here is not to reduce epistemology to the study of a set of epistemic, world-disclosing capacities. Of course, it goes almost without saying that epistemology is interested in other things: the nature and origin of knowledge, the reliability of our claims to knowledge, the nature of rationality and justification, and so forth, which *eo ipso* make little reference to epistemic agents and their capacities. The claim I am making is only the limited one that epistemology is interested in such capacities among other things. Thus, we are defending a kind of weak psychologism: we are not advocating the strong replacement thesis, but rather are calling for collaboration between fields.

Now, the epistemic world-disclosing capacities C^* just discussed in (1) are a special case of the generic capacities C that we examined in (3). This allows us to link together (1) and (3), and thereby legitimately move from factual to normative considerations. So the claim so far is as follows: certain epistemic capacities are epistemically relevant to epistemology (as defined here); if these capacities were to be explained by a given discipline N, say cognitive science, then the explanation provided by N ought to inform epistemology. Can such an explanation be provided? This is what we turn to next.

4.3. (2) There exists some cognitive science N, such that N can provide an explanation of the relevant epistemic world-disclosing capacity C^*, by functional analysis/decomposition of C^* into organized operations $f \in F_{C^*}$, and/or by mechanistic analysis of C^* into cognitive mechanisms $m \in M_{C^*}$ (among other things), or both

Once we have agreed that epistemology is interested in a given epistemic capacity C, and that an explanation of this capacity, if it was to be provided, ought to inform epistemology, the next step in arguing for the relevance of the cognitive sciences is to look for a candidate explanation of that capacity from cognitive science. Before proceeding to such an explanation, however, we need to frame the question such that cognitive science can be of help. Indeed, all we have considered so far is a given capacity, and it is not immediately clear that this capacity can be usefully explained.

What we propose to do is to account for the epistemic capacity in terms of a terminal parameter. This will allow us to think of epistemic capacities from a design perspective. Now, as discussed above, a terminal parameter is the upshot of a given activity, which can be maximized or minimized given the specific goals we have set out. Once such a parameter is made explicit, we can apply a host of scientific tools for two purposes. First, we can attempt to understand the capacity relative to the terminal parameter. This will allow us to explain how it is that the capacity in question is carried out. Second, this explanation of how the capacity is carried out will allow us to adopt an engineering or design perspective to see how we can maximize or minimize the terminal parameter. In the case of epistemic world-disclosing capacities, the terminal parameter might be the function of representing the world, and we can attempt to provide an account of adequate representation of the world (i.e., a design-normative account of representation) by thinking of representation as a rational epistemic action that is subject to means-end reasoning, and/or as a proper function with a goal and normal

conditions, which provide it with normativity. This analysis, in cognitive science, can be conducted in at least one of two ways.

Functional decomposition and analysis

One way to analyze a given capacity or regularity is to carry out traditional functional analysis (Cummins 1975; 1983; 2000; Block & Segal 1998; Dennett 1978). This analysis yields what we might call a functional decomposition F_{C^*} of the capacity C^* in question.[65] The idea here is to decompose the capacity of interest C^* into constituent operations $f \in F_{C^*}$. These operations figure in a functionalist explanation of the capacity, that is, they are sequenced and organized in such a way as to yield an explanation of the target capacity. The set of constituent operations $f \in F_{C^*}$ that figure in our reconstruction of what the system does to achieve its given terminal parameter are functions, insofar as they figure adequately in the explanation, as partial operations which together have an overall functional organization and account for how the capacity studied actually operates.

To clarify, what is called a "function" in functional decomposition and analysis is an operation that accounts for part of what a given system considered does. That is, a function is an operation that explains how the relevant capacity is carried out by figuring as part of the workflow that results in the capacity being carried out by the

[65] This step is reminiscent of moving from the computational level to the algorithmic level in Marr's classic (1982) computational model of cognitive processing. This step can also be cashed out in terms of Bechtel's and Craver's mechanistic approach to the mind (Craver 2007; Bechtel 2008). In this framework, what we have identified as the relevant epistemic capacity is the "phenomenon" to be explained. A mechanistic explanation decomposes the phenomenon into component operations and parts. Coupled or linked together, these parts and operations comprise a mechanism that explains how the phenomenon of interest is realized. To identify only operations, without considering the parts that implement them, would consist in functional decomposition.

system (see, for instance, Cummins 1975; 1983; 2000; Craver 2007; Bechtel 2008; Piccinini & Craver 2011). We thus move from the epistemic capacity C^* to the functional decomposition of this capacity F_{C^*} by specifying the sequence of steps (i.e., operations or functions) that allow the system to realize its terminal parameter. For instance, vision can be defined in the more general sense as a capacity that we have as embodied agents (namely, the capacity to see things in the world, and thereby disclose and know them). We can consider vision from a functional point of view by specifying the ends realized by vision (the terminal parameter), and then mapping out the operations that allow to system to reach those ends. The terminal parameter of vision, for instance, might be the achievement of a representation of the visual scene. An operation in the functional decomposition of the capacity might be directing visual attention, classifying and identifying the distal causes of visual stimuli, and so forth. All these operations unfold in tandem such that the capacity considered is carried out. In and of themselves, operations need not make explicit reference to the physical parts carrying them out (although we might suppose that operations and functions are in fact carried out by physical parts). Functional explanations of capacities are, or so the received functionalist view goes, independent from accounts of the realization or implementation of those capacities (Fodor 1965; 1968, 1974; Cummins 1983; 2000). As Fodor points out, one can provide a functional description of a target phenomenon without making reference to any of the physical parts that carry out the operations:

> If I speak of a device as a "camshaft," I am implicitly identifying it by reference to its physical structure, and so I am committed to the view that it exhibits a characteristic and specifiable decomposition into physical parts. But if I speak of the device as a "valve lifter," I am identifying it by reference to its function and I therefore undertake no such commitment. (Fodor 1968, 113; cited and discussed in Bechtel 2008, 136ff.)

Functional analysis is thus a decomposition of a target capacity, in our case the epistemic capacity at issue, to see how it is that the phenomenon can take place the way

it does. Typically, one proceeds to such a functional analysis by looking at the operations that make up a given capacity, as well as their organization, in terms of input, internal state, and output. The idea is to describe the relevant capacity of the system in terms of a sequence of operations, which act on an input that interacts with the system's internal state to produce an output. Such sequences of operations are often represented as flowcharts, which graphically represent the sequence of operations that make up the capacity considered.

Some central kinds of functional analysis can be explicated and enriched significantly in terms of information and information processing.[66] Now, information is a multifarious notion. It arises notably in thermodynamics, information theory, and in the cognitive sciences. We ought to say a few words about the notion here. To get a gist of what the term means, we might say that information is a relational, statistical, measurable quantity between two states of affairs, such that when one state of affair carries information about another, the occurrence of one is indicative (in some sense of the word) of the occurrence of the other. Information is thus related to the reduction of uncertainty, in that a state of affairs that carries information about another tells us something about the probability of the state of affairs that it carries information about.[67]

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[66] Not all functional analyses will be informational. A "valve-lifter," for instance, is not a device specified in information-processing terms, but rather, simply, in terms of input, output, and internal state of the system. Thus, functional analysis is the more general kind of explanation, which subsumes information-processing and computational-information-processing kinds of explanation.

[67] Information has been discussed in both semantic and non-semantic terms in the literature. Given space constraints, I cannot unpack the notion extensively, and will make a few general remarks. Non-semantic information is an information-theoretic notion that pertains to the statistical properties of signals being analyzed. One does not suppose that this information is "about" anything in particular. One can cash out this specific concept of information, as it is used in cognitive science, as "mutual information," which is a measure famously developed by Shannon that tells us about the statistical dependence between two distributions. Semantic kinds of information is information about the meaning of a given signal. This sense of information is used in the cognitive sciences, but its use is rather controversial: some (e.g., Fodor 2008) have argued that semantic views on information are misguided or mistaken. For one interesting account of semantic information, see Scarantino & Piccinini (2010). For a discussion the

The concept of information is relevant to psychology, as it explains how the internal states of the organism and the external states of the world are linked one to the other. To say that the cognitive system has or carries information about the world is to say something about the statistical relations that obtain between certain of its inner states and certain states of the environment.

Now, information is not only present in cognitive systems, in the sense that internal states of the system are statistically dependent on external states of the world. Information, moreover, is processed in cognitive systems, that is, manipulated and transformed to various cognitive ends. The system manipulates the information it has access to in order to intelligently accomplish tasks, and infer what is going on in the world. As indicated, this information processing is typically graphically represented as a flowchart that captures the flow and modification of information in the system. For instance, in traditional accounts of its functioning, the visual system isolates the many statistical correlations discernable in the information it has access to, in order to extract specific features of the stimuli that caused this excitation, and thereby reconstruct its distal causes. In other words, then, information processing is the manipulation of the flow of information in a system in order to reach a given terminal parameter. So the functional decomposition story can be applied to epistemic capacities insofar as functional decomposition makes explicit the kinds of information flows contained in a system.

Once the terminal parameter has been specified for a given capacity, and once we have decomposed the capacity functionally, we can think of it from an engineering or design perspective: that is, we can study how the terminal parameter is achieved, and how the system might better achieve it, by specifying the sequence of operations that explain

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relation between semantic and non-semantic accounts of information, see Piccinini (2004; 2008). For more on information and computation, see Piccinini & Bahar (2013); Piccinini & Scarantino (2010); Piccinini (2008).

how that function comes about, and then considering what design-normative conditions make it possible or could improve its functioning. In other words, once we have specified how a given capacity is functionally realized, we can then proceed to a design perspective and ask the question how that function might be carried out better or more efficiently. The normativity implicit in the term "better" can be read in the sense above, as a question of rational epistemic action or naturalized normativity. That is, we can examine the conditions in which the system operates, and propose adjustments to its operation depending on the chosen terminal parameter.

How are these considerations relevant to the psycho-epistemological argument? All the second step of the argument is claiming is that a given epistemic capacity, which is relevant to epistemology, can be explained in functional terms, and notably in terms of information and information processing (in at least one relevant sense of the term). This step of the argument should not be too controversial. After all, it is common practice, at least since the advent of psychology and cognitive science in the late 1950s, but also in sociology and biology, to analyze a given capacity in terms of the different operations that together yield the capacity under study. So the second step of the argument is merely the claim that the relevant epistemic capacity C^* admits a certain functional decomposition F_{C^*} from a given cognitive science, which explains that capacity.

Mechanistic analysis

There is an important trend in contemporary cognitive science that consists in coupling the functional analysis of the phenomena at issue with a mechanistic analysis of the

working parts that realize or implement these functions.[68] While functional analysis might lend itself to making explicit the kinds of operations that are ongoing in the nervous system, we might require a description of the mechanisms that enable these operations.[69] There is increasing interest in the "implementation" *m* of cognitive functions in recent psychological investigations. An implementation, here, means a physical part of a system that realizes the operations described at the functional level. Although the most obvious implementation of cognitive functions is the brain and its parts, the recent literature on "situated cognition" and "embodied cognition" suggests that other kinds of parts outside the brain, including the body, but also cognitive technologies such as personal computers and the Internet, might figure in such physically applied explanations.[70]

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[68] Again, this is akin to moving from the algorithmic to the implementational or hardware level in Marr's (1982) theory of cognition. A functional analysis can be considered as a "mechanism sketch" (Piccinini & Craver 2011), that is, as a functional description of a mechanism in need of implementational details to be provided by later, mechanistic investigations. Some authors, however, consider functional-psychological level explanations to be *sui generis* and irreducible to mechanistic explanation; see, e.g., Fodor (1974).

[69] A significant debate in the philosophy of cognitive science and in the philosophy of biology persists over multiple realization of biological and mental functions. That is, debate rages over whether it makes sense to speak of functional properties without making explicit reference to the physical parts that perform the operations. To thinkers such as Fodor, the autonomy of the special sciences (notably of psychology) rests on the explanatory relevance and autonomy of its predicates at its specific level. For thinker such as Kim and Bechtel, however, the physical implementation will necessarily constrain the functional account of any function whatsoever. See Fodor (1997; 1974; 1968); Kim (2006; 1999); Sober (1999).

[70] On "situated" (that is, on "extended" or "embedded") accounts of cognition, non-neural processes may participate in the realization of mental operations. Situated cognition in general is the idea that cognition spreads out or otherwise involves parts of the world. As the great study by Hutchins (1995) has shown, and as many others in the tradition have shown after him, cognitive processes can be distributed, such that the operations typical of a given function can be realized by, say, computers, the Internet, blackboards, and so forth. So the implementation in question need not necessarily be neural. To be committed to the view that every operation in F_{C^*} is realized by a brain structure would *ipso facto* commit me to a strong form of neural reductionism. Extended mind theorists make an ontological claim to the effect that cognitive processes literally extend into the environment. This view has also been called "active externalism" (Clark & Chalmers 1998), or again "vehicle externalism" (Rowlands 2003; 2006).

With this reductionist caveat in mind, we might suggest another way of providing an explanation for a target capacity: mechanistic analysis.[71] Mechanistic analysis of a capacity generally consists in linking or coupling operations provided by the functional description of the relevant epistemic capacity with a description of the working parts that carry out the relevant operations. Bechtel and Richardson (1992) have dubbed this process "localization," in line with the parlance of psychologists. Localization is the identification of a mechanism, where a mechanism is defined as a linked set of operations and working parts.[72] A mechanism is an implementation of a function, that is, a physical thing that performs a given number of operations that lead to the carrying out of the relevant capacity. To provide a mechanistic explanation of a target capacity is to provide a set M_{C^*} of mechanisms m that account for how that capacity is carried out.

Recent technological developments in the cognitive sciences, notably the refinement in software processing data from EEG and MEG, new brain imaging techniques such as functional MRI, and the advent of computational science, have allowed psychologists to study, empirically and with simulations, the implementations of the functions and operations that were once only described in terms of functional analysis.

Other theorists, e.g., Rupert (2011; 2004), Huebner (2013), and Adams and Aizawa (2001; 2009), reject this ontological claim, and instead propose an embedded account of cognition. They argue that the insights of extended cognition theorists about the dense coupling of external and internal resources could be well accommodated by the more conservative view that the cognitive system is organismically bounded.

[71] For accessible introductions, see Machamer et al. (2001); Craver (2007); Bechtel (2008).

[72] In its simplest form, localization is the coupling of an operation to a working part, the result of which is a mechanism. This localization itself can be complex or simple: a simple localization couples one operation to one part; but more complex localizations, involving many parts to one operation or many operations to one part, are also possible.

Some might argue that the implementational level is strictly required to account for a capacity, as we need to know how operations are carried out by physical structures, typically through forms of computation.

But what do we mean by "computation," here? One of the great insights of cognitive science is that the brain is in the business of computation.[73] Computation, however, is arguably not a merely functional notion, as it describes the manipulation of "vehicles," physical substrates that carry information, according to certain rules or regularities. Vehicles are "medium-independent" (Piccini & Scarantino 2010). That is to say, only a subset of their properties encodes information. Not every property of a vehicle is directly relevant to information processing: this is why a silicon chip and a network of neurons can effectively serve the same functional role, in the case, say, of restoring sight to a blind person. The physical features of the vehicle that encode information are only relevant to the cognitive system insofar as they allow the system to distinguish one vehicle state more or less unambiguously distinguished from other vehicle states. However, the computations defined over the vehicles depend on the physical substratum that realizes them, as there must be some physical states that encode information if further work is to be done on that information. The vehicle properties are thus relevant for the kind of information processing considered.

[73] There exists a debate over what kind of computation is performed by neural networks in the brain. The first wave of cognitive scientists, notably McCulluch and Pitts, supposed that neural computation was digital. Other schools of thought argued that neural computation is essentially analog. Recent in-depth studies by Piccinini have tried to show that neural computation is a *sui generis* kind of computation, neither digital nor analog. The brain makes use of certain of its vehicles' features (neurotransmitter levels, spike trains, and so forth) to manipulate the information it has access to, but this computation is of its own specific kind. The physical features of the vehicles thus end up making a difference in the kind of operation the system can realize. It can complement the functional information processing to provide an account of the specific mechanisms that realize the flow of information in the system, as well as the specific type of computation that they realize. There are marked differences between digital, analog, and neural forms of computation. See Piccinini & Bahar (2013); Piccinini & Scarantino (2010). The differences mainly lie in the different kinds of operations that different kinds of vehicles allow.

The idea here is that functional decompositions of the relevant epistemic capacity have a physical implementation, at least part of which is located in the brain. To provide a mechanism that underlies a given capacity is to provide a mechanistic explanation of that capacity. So the epistemic capacities we have been considering up to now admit functional as well as mechanistic explanations. Again, I am not arguing that every operation that is part of F_{C*} needs to be realized by specific mechanisms at the neural level. Recent studies in situated cognition argue that it is at least plausible that certain operations are actually carried out not by neural networks, but rather by parts of the environment. The point is simply that an account of the implementation of a given capacity (whatever its specific nature) can provide us with an explanation for that capacity.[74] Now that we have seen that there are frameworks in cognitive science for providing explanations of relevant epistemic capacities, every premise of the psycho-epistemological argument has been justified. We are thus justified to move to its conclusion:

[74] Note that I could have unfolded another set of considerations to a similar effect to my use of functionalist and mechanistic approaches. Some theorists choose to explain capacities using the tools of dynamic systems theory: this is the suite of dynamicist approaches. See, e.g., Juarrero (1999); Lewis (2005); Thompson (2007); Anderson (2014). Dynamicist approaches (typically, but not always) reject the concept of representation. Dynamicists often argue that the computer metaphor is inadequate for mental life, and propose a dynamical system, the Watt governor, as an alternative metaphor. The brain-mind would on this account be a self-organizing dynamical system, whose properties cannot be assimilated to those of (digital) computation. An expansive literature has emerged addressing this problem. See Clark (1997); van Gelder (1998); Bechtel (2012; 2009; 2008; 2007); Bechtel & Abrahemsen (2012; 2010; 2005).

4.4. (4) If *C** is epistemically relevant to epistemology, then epistemology ought to be informed by *N*

We have at this point unfolded the psycho-epistemological argument. If the argument holds, we are led to a contingent conclusion. The conclusion is that, insofar as epistemic capacities had by concrete epistemic agents are epistemically relevant to epistemology, and because there exists some cognitive science that provides an explanation of that capacity, then, given the principles of rational epistemic action, epistemology ought to be informed by cognitive science and its explanation of that capacity.[75] A few general remarks about the conclusion and its consequences are in order.

The first remark is that this is an argument for weak psychologism. It does not aim to usurp the function and questions that usually belong to epistemology. It merely states that epistemology, given some of its desiderata, ought to employ some of the methods and findings of cognitive science to answer its own questions. To study these conditions does not commit one to the view that the sciences ought to unilaterally justify their own practices. It is only to claim that questions in epistemology are not indifferent to the functional decomposition and mechanistic implementation of a given capacity.

The considerations examined above with regard to forms of explanation speak for the importance of the findings of psychology for epistemology. Consider the following illustration. It is reasonably well established that the visual pathway in the brain is split into dorsal and ventral streams, which process different visual traits (labelled as "what"

[75] Of course, other sciences might also be relevant to epistemology given its interest in the capacities of concrete agents. Kuhn's work, for instance, illustrates the kind of useful contribution that can be made by the historical and sociological sciences to epistemology.

and "where" streams).[76] This finding comes from mechanistic analysis of the brain and visual pathway. If the brain comes to represent what something is and where it is differently, then it stands to reason that we do not acquire knowledge about what something is and where it is in the same way. Moreover, some sense modalities, and even some operations within a given modality, may be more reliable than others, and thus lead more reliably to knowledge (see Hohwy 2013, 140ff. for discussion in a predictive coding framework). If this is the case, then epistemology ought to address these issues, insofar as it is concerned with concrete capacities had by epistemic agents.

More generally still, accounts of knowledge acquisition can explicitly draw on the functions and mechanisms of the nervous system. This is the case with Giere's cognitive approach to the philosophy of science. Giere (2010; 1999; 1990) draws on cognitive scientific accounts of how we represent our world and share those representations among each other by employing mathematical models, and links up scientific observation and model-building with the cognitive capacities that we are endowed with. It turns out that our capacities to build scientific models have a lot to do with our limited cognitive abilities and the particular features of our cognitive systems. Giere points out, for instance, that scientific work often uses visual, graphical representations of models and data to make sense of the phenomena studied. This use of visual representations is related to the prominence of our ability to process visual information. As such, our scientific capacities to build theories are in line with our cognitive makeup, and might be different if, for instance, we primarily relied on other sense modalities, such as hearing or smell, to make sense of the world. Having explored

[76] See Goodale & Milner (1992) for the canonical characterisation of the two-stream hypothesis. We should note that recent findings have contested the strict functional segregation of these pathways. Although the two pathways are anatomically distinct and functionally specialized, there also seems to be significant cross-talk between the streams, such that they are not functionally isolated. See McIntosh & Schen (2009) for a recent review.

these general considerations, we can try to respond to Husserl's accusations of circular reasoning and relativism.

Circular reasoning

One probative way to respond to Husserl's accusation of circular reasoning is to bite the bullet and embrace the alleged circularity. As we have seen, many authors since Quine (1969) have rejected the claim that the sciences are in need of anything like an *a priori* foundation. Our acquisition of knowledge in science and in everyday life are like Neurath's boat, constantly being rebuilt at sea. There seems to be no principled reason why epistemology today ought to lay out a fundamental groundwork for science once and for all. Rather, we might argue that epistemology and the empirical investigations it enables grow and change in tandem, especially if we view epistemology as interested in the epistemic capacities of concrete agents. While this may be circular, it may not be a vicious circularity, and may indeed prove unproblematic if we abandon *a priori* foundationalism.[77]

From an engineering standpoint, the conditions in which a capacity can be carried out, as well as the terminal parameter of this capacity, turn out to be relevant to understanding how we acquire knowledge. Friston (2014) has suggested that the

[77] Space constraints forbid me to unfold this line of reasoning in other philosophical traditions. I shall briefly mention one. In philosophical hermeneutics (e.g., Heidegger 1927, 148ff., 312ff.; Gadamer 1960, 270ff.), the circularity is embraced as virtuous rather than vicious, making it a methodological principle, called the "hermeneutic circle." This circle corresponds to the dialectical movement between our anticipations (our fore-structures of understanding, *Vorstrukture*) and our interpretation of the situation. Very schematically, on this account, our anticipations of what we grasp change as a result of our current interpretation, and our current interpretation is always the result of our anticipations of what we believe will be the case. There is thus no single absolute foundation to knowledge; rather, there is a process of continuous bootstrapping of our anticipations and our current interpretation.

mechanisms that allow us to perceptually grasp the world in the first place (i.e., predictive processing mechanisms) are the very same that we employ when using scientific reasoning: both our nervous system processes and our scientific interdisciplinary endeavors tend, on his account, to minimize the surprise of outcomes in experiment. There is thus a distinct continuity between the neural mechanisms that allow us to disclose and know the world, and the structure and purpose of scientific practice.[78] We produce better theories and models to minimize our surprise and to produce better predictions, just as our nervous system refines its internal model of the world to the same general effect. Science, knowledge, and mind are continuous.

Consider the work of Wason on errors in reasoning and inference, which suggests that we do not ordinarily perform as ideal epistemic agents. Wason (1960) has shown that we, as concrete epistemic agents, tend in general to make inferences from confirming evidence to reach our conclusions, rather than from both confirming as well as disconfirming evidence. Wason (1968) has also shown that subjects tend to make errors in logical reasoning, and tend to find making contrapositive inferences from conditional statements of the form $p \rightarrow q$ (that is, to infer $\sim p$ from $p \rightarrow q$ and $\sim q$) difficult, even unwieldy. Human agents thus have a tendency to attempt to confirm their beliefs rather than to attempt to falsify their hypotheses, which is contrary to how scientific investigation ought to go about, and tend not to employ more formal kinds of logical thinking when confronted with a problem. Or again, consider the work of Kahneman and colleagues. They have shown that typically, we use heuristic reasoning rather than strict algorithms to solve a variety of everyday cognitive problems. What studies like these show is that, given our nature as limited, finite epistemic agents,

[78] This continuity, of course, is couched in rather abstract terms at the functional level, and is purchased at the cost of implementational detail. The world-disclosing neural mechanisms that concrete agents are endowed with and the structure of scientific practice may have a common functional architecture, but the physical structures that realize them will necessarily be heterogeneous in nature, and in effect, the mechanisms that implement the former will be included the implementation of the latter.

resulting from a long evolutionary history, we employ some strategies that are not epistemically optimal.

To account for such suboptimal reasoning might very well be important for projects aiming to study how we, as finite epistemic agents, acquire knowledge.[79] Given that we know that we tend to make such errors in reasoning (this is knowledge of the engineering or design kind we discussed above), then we ought to design our scientific investigations in such a way as to counteract this tendency. The point, again, is not to commit the naturalistic fallacy by arguing that, because humans reason in this or that way, they ought to reason in that way. It is only to show that knowing about such flaws in our reasoning, and understanding them from a design perspective, might allow us to better our scientific investigations and make better inferences on a daily basis. The process of scientific investigation and the justification of our claims to knowledge thus improve one another, and allow us to bootstrap our knowledge about the world and our knowledge about our knowledge.

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[79] Husserl might reject the relevance of these claims for epistemological projects. His diagnosis is that psychologism stems from the conflation of the factual, empirical laws that underlie acts of judging with the normative laws of logic (see for example Husserl 1900, §22). While acts of judging are real events, with causes and effects, and are subject to empirical regularities which can be discovered through experimentation (as in the work of Tversky & Kahneman 1974), the laws of logic are *contents* of mental activity, and as such have a normative rather than a causal role. The latter laws can only determine the thought process, says Husserl, once they have been taken up explicitly as norms for correct thinking. For example, while confirmation bias may be an empirical regularity about how humans reason (Wason 1960; 1968), this "law" does not have normative force; while human beings may be prone to error in such and such ways, they can also reason according to the laws of logic. Notice the difference in the kind of law involved in each case: on the one hand we have the laws of a theoretical discipline, and on the other, those of a normative discipline (for Husserl's distinction between theoretical and normative disciplines, see the Husserl 1900, §§13-16). To conflate both kinds of laws would make it impossible to account for errors in judgment. Moreover psychologism, which for Husserl is a kind of relativism grounded in traits of human nature, errs on his account in conflating causal processes with idealities. My judgment, for instance, that $2 \times 2 = 4$ may be causally determined by, e.g., the mechanisms of the thought process; however, *that* $2 \times 2 = 4$ is not a fact, nor is it causally determined by facts about my makeup as a human being.

Relativism

The accusation of relativism is perhaps more difficult to counter. It might be worth recalling what this accusation consisted in. Husserl, notably in his *Prolegomena*, accused the advocates of psychologism of lapsing into an indefensible and absurd form of relativism. This was because, on their account, the truth of a given matter of fact would depend on the psychological makeup of the epistemic agent. For Husserl, this was nonsense, because it conflated the act of judging this or that to be true with the content of that judgment. The father of phenomenology was a Platonist: for Husserl, although psychological factors could, and of course did in fact, participate in the act of judgment, the contents of judgment themselves were objective idealities, whose truth value in no way depended on the makeup of the agent judging. To argue that psychology could tell us something about the truth value of the contents of a judgment was contrary to his Platonism, and therefore absurd.

I cannot hope to provide a thorough and extensive refutation of Husserl's accusation here, given space constraints. However, I believe that I can provide the sketch of an answer, specifically by pointing out that if we reject Husserl's Platonism, then there is way to supplement his framework that allows us to ground truth in our access to the matter of fact, which exists independently of any epistemic agent. One can argue, in line with Sigwart (1904) and Schlick (1910), that Husserl's conflation of truth and reality obfuscates the situation and leads him to accusations of relativism that are unfounded. On this account, what is nonrelative to the epistemic agent is arguably not truth, but rather the matter of fact. To counter the accusation of relativism, we just have to show that the epistemic agent has access to the matter of fact. One way show that this is the case is to consider the epistemic capacity for an intentional, interpretive relation with the world. This capacity is what allows the agent to access states of affairs

in the world. I shall now present an outline of how we could address the capacity from a functionalist point of view.[80] While this functionalist account does not provide a complete explanation of intentionality, it does help us see how a response to Husserl's accusation could be attempted. My proposal is in no way meant to be definitive or exhaustive. I am only gesturing towards a general kind of response.

Traditionally, the intentional character of our mental experience has been explained in philosophy of mind one of two ways, one of which will retain our attention.[81] The causal account of intentionality argues that what grounds our intentionality is the fact that we are directly, causally involved with the distal causes of our sensory states. It is the fact that distal causes have effects on us (specifically on our sensory surfaces) that grounds our ability to perceive them. In information theoretic terms, the claim is that mutual information between the environment and the sensory surfaces is ensured through causal connections between the environment and the input channel. The capacity for an intentional relation to the world is ensured through the operation of selectively sampling the environment in order to derive (mutual) information about it. The organism must be able to acquire information about its world through the causal connections between the world and what we might call its "input channel."

This claim does not seem particularly controversial. Nearly all models of cognitive processing suppose that at some step in the functional architecture, the cognitive system

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[80] One could, of course, complete the picture by suggesting mechanistic implementations of this capacity. I shall limit my discussion to functional decomposition for lack of space. Note that I am not suggesting that Husserl's theory of intentionality could simply be replaced by a naturalistic explanation of the same. I am merely suggesting that a naturalistic explanation of intentionality contains some elements that can help us respond to Husserl's accusation of relativism.

[81] The second is the descriptive reading of intentionality. Hohwy (2013) has proposed an integration of both approaches under the banner of predictive coding mechanisms. Now, traditionally, the many issues surrounding intentionality have been addressed in the philosophy of mind, rather than in epistemology. I would argue, however, that these issues indeed have epistemological significance.

receives what can generically be called sensory input from the world. This sensory input is the basis of the perception of the outside world and the physical body: it is necessary (although perhaps not sufficient) to perceive a world as such. The crucial point is that the organism only has access to the varying signals present in its input channel, and it is through these signals that it manages to have access to the world. This information is used to disclose the world, because it is only starting from this information that the cognitive system can represent the world at all. It is necessary for the disclosure of a world, for we only know the world as such because the hidden causes in the world are represented at some level in (or on) the sensory surfaces.

Consider the "Bayesian room" problem discussed by Hohwy. The cognitive system only has access to a noisy sensory signal, which was encoded in its input channel. The system must, solely from this noisy signal, reconstruct the causes in the world, but this process of reconstruction is far from trivial. The sensory signals that impinge on the sensory states of the system, after all, overdetermined: there is no simple, neat one-to-one correspondence between a pattern of sensory activation and the distal causes at its source. The exact same sensory impression can be caused by many different quite heterogeneous distal causes: for instance, a picture of the moon and the moon itself, when seen from the right point of view, might cause the very same retinal impression. Yet we do experience a world of things, we manage to infer the distal causes of our sensory input. As such, it seems reasonable to suggest that the nervous system has a way to extract the distal causes from the impinging sensory stimulation. After acquiring information, the nervous system interprets the signal to extract its distal causes. We thus have a functional information processing sequence, whereby information acquired is interpreted or processed at a later stage.[82]

[82] Of course, to provide an actual explanation of this information processing sequence in the form of a functionalist or mechanistic model would be necessary if we were to examine the interaction between how the capacity is realized and how our epistemic norms change in consequence. This, however, is

To (partially and non-exhaustively) explain intentionality in this way can go some ways toward countering accusation of relativism, because it shows how the system can reliably access the state of affairs in the world. We can reject Husserl's Platonism without for all that necessarily lapsing into relativism, at least on this line of reasoning. Although the system's access to the world is mediated by its functional constitution, the state of affairs itself is not; the system can proceed to infer the causes of its sensory states and reliably disclose things in the world. This allows it to know the world.

Conclusion

The aim of this chapter was to address the relevance of psychologism for contemporary epistemology and provide an argument for what I called weak psychologism. I first discussed psychologism in light of the varieties of naturalism that I distinguished in the first chapter. I identified two kinds of psychologism, namely strong (or replacement) psychologism and weak (or collaborative) psychologism. After reviewing Husserl's argument against psychologism, I discussed the new conception of epistemology, which has abandoned foundationalism, and is increasingly interested in the capacities of concrete epistemic subjects, rather than by the abstract faculties of "pure" epistemic subjects. I proceeded to the psycho-epistemological argument itself. The argument concludes that if epistemic capacities of concrete epistemic agents are indeed relevant to epistemology, then epistemology ought to heed the explanations of these capacities provided by the cognitive sciences. In closing, I suggested that some of the arguments Husserl raised against psychologism could be defused with the argument on offer. In

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beyond the scope of the present chapter. My aim is only to point to such a possibility, and to sketch the kind of explanation one might invoke of our epistemic capacities.

the end, the success of my argument depends crucially on accepting the new view on epistemology that I have discussed.

CONCLUSION

What have I learned?

I have changed a great deal while working on this project. This change, I believe, was reflected in the writing process itself. I started writing the first chapter of my thesis with the naïve triumphalism that is the wont of new, enthusiastic graduate students. My tune would change quickly before the challenges that lay ahead. My appreciation of the difficulties inherent in the project I initially proposed nearly three years ago has increased, and with it, my scepticism with regard to that same project.

I think I can break down the writing process itself into two phases. The first started in May 2013 and lasted until I submitted the first chapter for publication in October of that same year. I started my research with a naïve conception of transcendental phenomenology, and with the equally naïve idea that the projects to naturalize phenomenology had for the most part solved the problem of uniting the transcendental phenomenological and the cognitive scientific perspectives into a unitary research programme. I did not yet see the difficulties with these positions. I had not yet, I now see, sufficiently familiarized myself with Husserl's transcendental phenomenological project to see why things were not so simple. I knew a good deal about phenomenology, but I had never been presented with the foundationalism inherent to it, and I was utterly unfamiliar with Husserl's doctrine of essences.

It was my belief that phenomenology was a research programme that sought a definite and irreducible role for conscious experience in epistemology, that aimed to define the function of conscious disclosure of the world in our account of how we manage to acquire knowledge about the world. However, there was much more to the story. Early

on, many discussions with some dedicated Husserl scholars made me realize that there were complexities in the questions I raised that I had not sufficiently considered, complexities concerning the nature and motivations of Husserl's project. I spent most of my time in this first phase reviewing the primary and secondary literature on transcendental phenomenology, with the goal of understanding the project that Husserl had laid out, and of examining the limits of the various contemporary attempts to naturalize phenomenology with respect to the desiderata of his project. I discovered, to my amazement, that transcendental phenomenology was a different sort of beast than what I had anticipated.

I spent the fall writing the chapter itself. Still convinced that Husserl's project provided an interesting framework for epistemology, I sought a form of naturalism that would be compatible with it. By then, I had realized that the naturalization projects in epistemology, and indeed also the project to naturalize phenomenology, were contrary to Husserl's approach. I would rewrite the chapter twice in response to reviewer comments, and each rewrite made it clearer to me that it was against the spirit of transcendental phenomenology to allow for naturalization, both of epistemology and of phenomenology. This first phase of the writing process ended with the publication of my first thesis chapter in the journal *Phenomenology and the Cognitive Sciences*.

Writing the first chapter made me more knowledgeable about transcendental phenomenology, but also more sceptical about Husserl's project. After reading many of his published and posthumous works, I realized that I had not found what I was looking for. I sought in Husserl's corpus an epistemological framework apt to articulate consciousness and physical embodiment, a project apt to determine how what we call consciousness fits into contemporary epistemology. Instead, I found foundationalism and idealism. After publishing my first chapter, I decided that I no longer endorsed Husserl's project, and wanted to step outside of its boundaries. The second chapter

reflects this change in position and takes as its starting point those very positions Husserl criticized with so much conviction.

Have I succeeded in what I set out to do?

In general, my self-assessment is that while each chapter, considered separately, arguably reaches its aim, the thesis itself falls short of its original objective to build a bridge between naturalistic epistemology and transcendental phenomenology. Writing the thesis made me realize, more and more with each passing hour, and with each rewrite, that a rapprochement of the kind I wished for at the outset was impossible. I take solace, however, in that I think I have been able to show why the dialogue between naturalistic epistemology and transcendental phenomenology is so difficult, notably by identifying the premises of contention and the main conceptual tensions between the two frameworks. Furthermore, I think my thesis makes a fair attempt at exposing these difficulties from both sides of the divide. Although I fall short of my original goal, this modest success, in itself, is cause, if not for celebration, then at least for the satisfaction of having shown why my initial project could not be carried out.

The first chapter, I think, does what it sets out to do. To the best of my capacity, I have tried to define a form of naturalism compatible with transcendental phenomenology, and I think I may have succeeded in this modest respect. This means that naturalism *per se* is not antithetical to Husserl's project, at least not in every sense of the term. I have drawn on some of Husserl's posthumously published works, especially the second and third volumes of the *Ideen* series, to show that the father of transcendental phenomenology viewed the mind (*Seele*) and the lived body (*Leib*) as parts of the ontological region called "nature," that is, as natural things with natural properties, subject to natural nomological regularities. In as much as this entails that the mind and

the lived body can be studied by the natural sciences (especially, as Husserl proposes, by the science he called "somatology"), it seems to be the case that a weak form of naturalism is compatible with the transcendental phenomenological framework. This arguably opens some space of dialogue between cognitive science and transcendental phenomenology. But, in the end, does this get us any closer to bridging naturalistic epistemology with transcendental phenomenology?

The form of naturalism that I arrived at, the conditional form of methodological naturalism, is weak indeed. Many partisans of the project to naturalize epistemology and phenomenology might find the position much too weak to be of any use to their own projects. The idea, central to these naturalistic thinkers, that epistemology (and/or phenomenology in its epistemological function), might be reduced to psychology or any other natural science—or even be informed by drawing on some of their methods—is contrary to the fundamental tenets of Husserl's transcendental phenomenology. Although a form of naturalism is, as I have tried to argue, fully compatible with, even complementary to, the project for a transcendental phenomenology, it is unlikely that this rapprochement will be seen as a useful accommodation (or even a fair concession, really) for those engaged in naturalization projects.

So, although the first chapter achieves its immediate desideratum, insofar as it defines a variety of naturalism that is compatible with transcendental phenomenology, it does not really advance us in our attempt to bridge the domains of naturalistic epistemology and transcendental phenomenology. The rapprochement fails: *constat d'échec*. Nonetheless, I would argue that the first chapter does have the merit of showing how and why the rapprochement fails. The bridge collapses because of the irreconcilable differences between the premises and commitments of the naturalistic and transcendentalist conceptions of epistemology and their respective relation to the sciences. Husserl's project is a foundationalism: epistemology must unilaterally provide a foundation for the sciences. Naturalistic epistemology is a rejection of this

unilateralism, a call for either replacement or collaboration. Dialogue is impossible because both parties adopt contrary premises.

Similarly, I believe that the second chapter achieves its proximal objective, but does not really help to bridge the abyss between both registers either. The second chapter presents the argument that, insofar as we endorse the recent paradigm shift in contemporary epistemology, which is now interested (among other things) in the epistemic capacities of concrete agents, then psychologism follows. That is, in as much as it is the case that (1) epistemology is interested in how concrete agents, that is, agents such as ourselves, agents that are embodied and embedded in historical and cultural contexts, manage to acquire knowledge about our worlds; given that (2) there exist sciences that provide explanations of those capacities; and given that (3) these explanations ought to matter to epistemology if one of its aim is to account for such capacities; then it follows that (4) psychology ought to inform epistemology.

The reason why this argument, even if successful, fails to provide us with a bridge between the two fields is that it rests entirely on accepting the first premise, as indicated repeatedly throughout the chapter. And ultimately, it is really this first premise that is contentious form the perspective of transcendental phenomenology. What separates naturalistic epistemology from Husserl's transcendental phenomenology is arguably a significant and irreconcilable difference in how each party understands the subject of knowledge. For the naturalistic thinkers, the subject of knowledge is the concrete agent. However, for transcendental phenomenology, the subject of knowledge is none other than transcendental or absolute consciousness. Husserl repeated, again and again, that he was not interested in the psycho-physical subject: the transcendental reduction precisely brackets that subject, and discloses the "pure" consciousness that constitutes or discloses everything else. So, while the argument does not bridge the abyss *per se*, it nevertheless has the merit of showing us exactly where the naturalistic epistemologist and the transcendental phenomenologist are bound to disagree.

Limits and concessions

The thesis on offer here has many limits. I could have looked for points of contact elsewhere. There are certainly many more such points than those I have been able to study in this thesis, and they may have helped to shed additional light on the issues addressed. For instance, as indicated in the introduction, I could well have examined some of the later works in Husserl's corpus, in which his interest in experimental psychology, as well as its relation to the epistemological dimension of transcendental phenomenology, is taken as theme and expanded upon. Many other directions would have been possible, and early drafts of the second chapter reflect these possibilities. I could have focused my attention on the issue of evidence, which made Husserl the target of much criticism, and which in part motivated his later turn to a philosophy of the transcendental subject. (One of the earlier versions of the second chapter tried to examine the limits of evidence in the phenomenological framework, and to suggest that the gaps in conscious evidence pointed towards the operation of unconscious cognitive processes.) I could have followed this path and many others.

Despite this, I do think that I have found what, in the final analysis, prevents naturalistic epistemology and transcendental phenomenology from coming into serious dialogue. I wager that these difficulties, inherent in the foundational project itself as well as in the conception of the epistemic agent pertaining to each project, would have resurfaced no matter the angle of pursuit. The projects are irreconcilable at many different levels.

My treatment of psychologism is also, admittedly, rather partial. Psychologism for Husserl was not only a position in epistemology, but also in logic and mathematics. Husserl's anti-psychologism was motivated in a large measure by his commitment to

the ideality of meaning and to the irreducibility of meaning to psychological processes and concrete characteristics of the epistemic agent. Although I address the issue in passing in the second chapter, it may have been worthwhile to explore the connection between epistemological and logical forms of psychologism, as one of my evaluators has suggested.

The thesis also admits of limits as to the scope of the literature reviewed. My review of the work on naturalistic epistemology could have been expanded upon significantly, to include more recent work on the questions by authors such as Kitcher, Kornblith, Goldman, and Stich. Indeed, I essentially stick to the body of work produced from the late 1960s to the early 1990s, and the field has admittedly changed since. Doing so might have streamlined the first three sections on naturalism, as the question of weak versus strong psychologism seems to be discussed extensively in this more recent literature.

The questions I explored during my master's degree will continue to fuel my reflection, but I feel I have moved on to a new set of questions. My research, however, has opened my eyes to the possibility of using the many things I have learned in phenomenology and epistemology in a concrete way.

I am grateful to everyone that has helped me along the way.

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