The Real Reason For The Replication Crisis

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Master Thesis

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Abstract:

Since the 2010's Psychology is in a replication crisis. There is an active debate within the discipline to "solve" the crisis. I argue that so far, most of the debate has been ignorant about the real problem causing the crisis. Roughly the crisis literature be grouped into *a replication, a normativity* and *a validity crisis* (Lundh, 2019). Most authors focus on the first to issues. While in reality the current crisis is *a validity crisis*, the method's of psychology pass by the nature of its problem (chapter 1). I show through the work of Edmund Husserl how the problem arises as a consequence of the Galilean method of natural science (chapter 2). Then, I show how in psychology's history the naturalism, which arose with the scientific revolution, kept it stuck in a perpetual crisis causing a perpetual cycle of revolutions (Introspectionism, Behaviorism, Cognitivism, Enactvisim) (chapter 3). Lastly, I sketch out Husserl's proposed solution to break the cycle and arrive at scientific psychology on new terms which capture the essence of the mind as essentially subjective (chapter 4).

The Real Reasons for The Replication Crisis

Introduction

Since the 2010's psychology has been in a replication crisis. Especially with a publication by Nosek et al. (Open Science Collaboration, 2015), this crisis got attention. Nosek et al., replicated 100 studies from three reputable psychological journals, but in many cases found divergent results from the original studies. Only 36 % of the studies reached statistical significance upon replication, even though, 97% of the original studies were publishes with significant results. The teams carrying out the replication attempts judge the study to be a successful replication only in 39% of the cases. Generally, scientific hypotheses must be testable under specific and clearly defined conditions which must be replicable by other scientists. For, if an experiment provides "knowledge" about a hypothesis, we must expect that up on replication of this experiment the results are in accordance with our "knowledge". If, however, we obtain a different result upon replication, it shows that we did not actually "know" the relationships between the variables and the context in our experiment. Our first conclusions about the hypothesis turn out to merely be beliefs, not knowledge (Zwaan et al., 2018). In short, psychology in order to live up to the standards of a science needs replicable results. Hence, Nosek et al. sparked a lot of discussion, and psychologists have actively been trying to make psychological research replicable ever since. However, I in this paper will show that the bulk of these efforts miss the mark. I will argue that if psychologists are not engaging with the true nature of the problem the discipline will remain in a *perpetual state of crisis*.

Most authors in the current debate assume that the way psychology approaches its subject matter is just fine. Anchored in the scientific method, psychology's method is equally secure as that of the natural sciences. They suppose we need to make replication standard and or change the scientific norms and culture (away from "Publish or Perish", (Lundh, 2019). Only recently, at the fringe of the current discussion (with small numbers of citations), a few

authors have raised methodological and theoretical concerns (Morwaski, 2019; Flis, 2018; Lundh, 2019; Wiggins & Christopherson, 2019). These authors are aware that the crisis runs deeper, thus they call on philosophy to contribute to the discussion and they call for 'conceptual work'[1]. However, apart from Lundh (2019), who proposed to move to a *person oriented* instead of a *variable oriented* approach to psychology, these authors do not engage in the necessary conceptual work themselves. This paper is an attempt to follow up on these calls and bring philosophy to bear on the crisis.

In fact, the problem goes far back in time and has plagued psychology since its very inception. Psychologists based their method and epistemological framework on the model of classical physics, because of physics formidable success. This led to an unquestioned *naturalism*, which leads psychologists to take "*nature*" as it is constructed in natural science (physics) as an unquestioned premise (Husserl, 1970). In fact, at first glance naturalism seems very plausible. However, the superficial plausibility of naturalism, never allowed psychologists to ask whether naturalism would be the correct approach to their subject matter. Following Husserl (1970), I will show that this way of apprehending psychology is precisely the reason why psychology's history is only a "*history of crises"* (Hua 6/207). Substantiating Husserl's concern, there are voices claiming that psychology was in crisis long before the current replication debate. Even to the degree that some authors speak of a distinct genre of "crisis literature" (Goertzen, 2008; Morawski, 2019; Giorgi, 1976). Through Husserl's analysis I will show an alternative to a psychology based on *naïve naturalism*.

So far, naturalism has prevented psychologists from grounding their empirical research in truly psychological concepts [*das Eigenwesentliche einer Seele als solcher* (Hua 6/216)].Whereas physics, for example, has its more or less unequivocal concepts such as mass, energy, time, space, electromagnetic force etc., and a consensus on how to measure them, psychologists struggle to find the same form of consensus for their fundamental

[1] Debrouwere and Rossee (2022), and Yarkoni (2022) must be mentioned here, even though they do not "call for philosophy".

concepts. Therefore, psychologists struggle to establish any meaningful connection between theory and experimental results (Yarkoni, 2022; Debrouwere, & Rosseel, 2022). With Husserl's phenomenological method truly psychological concepts can be grounded in scientific consensus. Husserl promises: phenomenological psychology can be what mathematics is to physics, the science which provides the a *priori* for empirical investigation. The goal is to remind psychologist of Husserl's foundational work as a "*Discours de la Méthode*" (Hua 6/254) for a *science* of the mind [*Geist*].

I will present the ideas in the following manner. First, I will walk the reader through the current landscape of the crisis literature in Chapter 1 (The Replication Crisis As a Validity Crisis). After that, in chapter 2, I will show how naïve naturalism biased psychology to copy its method from physics (The Real Problem: 'Naïve' Naturalism). Then I will go through the history of psychology and demonstrate how all psychological revolutions remain anchored in naturalism (Psychology's History of Crises). Lastly, I will show an alternative method, a solution for the replication crisis on the level of theory in Chapter 4 (An Alternative: Phenomenological Psychology).

Chapter 1: The Replication Crisis as a Validity Crisis

Even though they have identified many valid problems relating to the failure of replicating results the actual issue underlying the crisis is not touched upon by most authors contributing to the debate. They have revealed problems of methodological nature, and others surrounding the culture of scientific practice in general ("Publish or Perish"). However, they have not addressed the fundamental confusion of the field, which remains unidentified (due to "dogmatic slumber") at the theoretical level.

The replication crisis began to attract academic attention between the years 2000 and 2010 as a debate about the trust worthiness of scientific literature in multiple fields, including those outside of psychology (Flis, 2018). In a seminal article entitled "*Why Most Published Research Findings Are False.*" Ioannidis (2005) questioned the truth of scientific findings.

Factors such as: small sample sizes, small effect sizes, a vast number of established relationships which cannot easily be narrowed down, great flexibility in design, definitions, outcomes and analysis, non-scientific and prejudiced stakes (e.g., financial interests) and the chase of statistical significance by competing teams challenge the validity of published research. Apart from the "hard" factors such as sample size and effect size, Flis (2018) summarizes Ioannides' claims as follows:

> " […] as a consequence of […] preference by journals to publish only positive results, […], perverse incentives pushing scientists to publish more and faster, and the gold standard of p-values as a criterium for publication; whole scientific fields are potentially just collections of biased estimates of true effect sizes" (p. 32)

The stress in Ioannidis' title is on the word *published*. Scientific findings are biased through the selection procedures for publication, known as *publication bias*. Journals almost exclusively publish positive and significant results. Concomitantly, scientists' careers depend on publications. Therefore, scientists try to reach results with statistical significance while all the studies which show negative results remain unpublished, creating a *file drawer problem* on the flip side. Originally this critique focused on biomedical sciences, in particular the field of genetic associations (Moonesinghe et al., 2007). However, due to psychology's bureaucratized methods and reliance on inferential (frequentist) statistics some subdisciplines of psychology fulfilled many of Ioannidis criteria. On top of that there arose controversy about widely public cases of questionable research practice (QRPs) and even outright fraud committed by reputable psychologists (Flis, 2018).

The debate gained a lot of traction within psychology following the large replication effort, mentioned in the introduction. Driven by the climate within psychology around the early 2010's (Chivers, 2019), Nosek and colleagues (Open Science Collaboration, 2015) decided to empirically test the replicability of psychological science. They replicated a total of 100 studies out of 3 reputable Journals from the year 2008. The results seemed to confirm the

worries. While 97 % of the originally published results were significant, only 36% of the results remained significant upon replication. Less than half of the studies were rated a successful replication by the research teams (39%). This was perceived as a problem and psychologists were eager to reform psychology in order to maintain its scientific integrity.

Even though there are many voices within the literature who seem to think that there is no real crisis (e.g., Stroebe, & Strack, 2014; Baumeister, 2016; Gilbert et al., 2016), most authors seem to agree that there is a problem. However, they differ in what they perceive to be the problem and the solutions. In order to gain an overview of the literature, we can group it according to Lundh's (2019) distinctions. Lundh distinguishes between *replicability-*, *normativity-* and *validity crisis.* These issues are not mutually exclusive, nor can all authors be perfectly grouped into one of these categories. Yet, they are very useful to illustrate the key topics within the debate and give the reader a simple overview of this vast literature.

Replicability

Authors who see the current crisis as an issue of replication, claim, that if psychologist were to exactly/directly replicate their studies more often, then the worry that whole fields might just be collections of biased estimates of true effect sizes would be reduced. They argue, psychologists should engage in exact/direct replications as opposed to merely conceptual replications (Zwaan et al. 2018). An exact replication is an attempt to replicate the "exact" same study another time, whereas a conceptual replication tests the same theoretical idea with new populations, variables, manipulations or different study designs (Zwaan et al. 2018). Obviously, in psychology a study is never an "exact" replication, thus here "exact" is defined as "exactly" replicating *what is considered to be of importance to reproduce the effect of the original study*, whereas supposedly irrelevant factors like whether the experiment happens at 2 p.m. or 3 p.m. or what the participant ate for breakfast are allowed to vary.

In contrast, conceptual replications rely on extending the findings by twisting parameter or introducing new ones. They can potentially perpetuate publication bias. In

combination with the journals preference for positive results, the non-significant conceptual replication will remain in the file drawers whereas the statistically significant ones will get published. Then, just looking at the published literature, it will appear as if the effect is replicable. However, in reality the negative evidence simply has not been published, because under the assumption of a valid effect in the original study the replicating researchers attribute their failures to the newly changes. Thus, a lack of exact replication paired with the publishers' preferences for positive results can lead to biased estimates of true effect sizes. Therefore, authors who see the current crisis as an issue of replication, argue we need to make exact replication standard (Zwaan et al. 2018). By now, they have had some success, for example, in 2016 the Netherlands Organisation for Scientific Research (NWO) has allocated 3 million euros funding over 3 years for the replication of studies, in the world first replication fund (Baker, 2016).

Normativity

Still, some authors claim that the crisis runs deeper than a mere lack of replication. The pressure to publish, for example, is an issue even if there are grants for replications. These authors argue that the replication crisis is caused by the scientific culture and norms. Lundh (2019) names this position a *normativity crisis*, it means: "[…] that the research community functions according to norms that are not conducive to scientific progress." (p. 4). The focus here is on the researcher's degrees of freedom and the "Publish or Perish" culture.

The problem with degrees of freedom for researchers is, that they can lead to questionable research practices (QRPs). At many points in the research process the scientists have a plethora of choices, such as how to collect data, which statistical analysis to use and so forth. They can thus explore different paths along a choice tree but only report those that "worked" (reached statistical significance), thus biasing the view of the effect. Degrees of freedom have been abused and scientists engage in QRPs, such as hypothesizing after the fact,

P-hacking and many more (Wicherts et al., 2016). A survey of 2000 psychologist revealed that the use of QRPs is “surprisingly high” (John et al., 2012).

Moreover, publish or perish culture implies that the social incentive structure in science rewards QRPs and manifests publication biases. Due to the preferences of publishers for positive results, there is little incentive for scientists to pursue exact replications or even write out manuscripts with null results. Publishers might have interest that do foster their business but might not be aligned with the rigor of scientific investigation. Whereas scientific rigor needs all results (including negative), publishers are focused on flashy results which find many readers. Another aspect of the social incentive system is grant culture. Grant culture refers to the fact that universities often expect or require external funding for promotion or faculty tenure, in ways that reward acquiring funding more than they reward good research (Lilienfeld, 2017). However, Lilienfeld points out that the ability to acquire funding is not indicative of scientific achievement and quality of research. Acquiring funding and conducting research are two activities that rely on different skill sets. Hence, scientists who are good at getting funding are even unlikely to be the ones who are good at conducting research. Moreover, the pressure to secure funding promotes QRPs and might lead scientists to pursue research topics which are fundable instead of strictly scientifically motivated. Similarly, methods could be chosen in ways that secure funding rather than being scientifically demanded. For example, neuro imaging seems to be more heavily pursued due to it increasing the chance to obtain funding and not due to the scientific demands of the study (Lilienfeld 2017).

Solutions to the *normativity crisis* aim at reforming the social incentive structure and the scientific norms of conduct to battle QRPs. For example, registered reports have been suggested and gained some uptake by the scientific community. Through committing researchers to hypotheses and statistical analysis before they collect the data registered reports

can prevent exploration of the choice tree. Moreover, Nosek (2019) published a whole strategy for culture change through the Centre for Open Science.

Validity

Lastly, Lundh (2019) distinguishes a third way of looking at the crisis namely a *validity crisis*. In order to illustrate what he means with a validity crisis Lundh refers back to a quote by Wittgenstein. A validity crisis is when as Wittgenstein remarks in the penultimate remark (No. 371) of the Philosophical Investigations "Problem and method pass one another by." (Wittgenstein, 1963, p. xiv). If there should indeed be a mismatch between problem and method, the validity of the whole approach to psychology is in question. Findings generated by a method which passes by the problem are not valid answers to that problem. Therefore, if there was a *validity crisis* in psychology, a solution would require a shift in how to do psychology at a fundamental level. Moreover, it would mean that emphasizing *replicability* or *normativity* will not cut it. According to Lundh, a *validity crisis* calls for a fundamental change in "conceptual framework and methodological assumptions." (Lundh, 2019, p. 6). Lundh claims that in the words of Kuhn (1962), this would constitute a *paradigm shift*. I am going to argue that indeed psychology faces a *validity crisis*. Even though the *replicability* and *normativity* concerns are valid and need to be solved, the true problem runs deeper. Thus, solving only the first two issues will without doubt improve psychology as a discipline, but will fall short of moving psychology out of its crisis. Yet, most of the publications since 2010 only treat the current crisis as an issue of either *replicability* or *normativity* or both.

However, going back further than 2010 in the literature reveals that the problem is not only a recent problem of replication but that the state of crisis in psychology has been diagnosed much earlier. I already mentioned Wittgenstein's penultimately remark in the *Philosophical Investigations*, it is worth quoting it here at length, in order to see what a validity crisis amounts to.

> The confusion and barrenness of psychology is not to be explained by calling it a "young science"; its state is not comparable with that of physics, for instance, in its beginnings… For in psychology there are experimental methods and *conceptual confusion*… The existence of the experimental method makes us think we have the means of solving the problems which trouble us; though problem and method pass one another by. (Wittgenstein, 1963 p. xiv, emphasis added)

The recognition of this problem goes even further back. Husserl claimed already earlier in 1936 in *The Crisis of European Sciences* that the history of psychology is "is actually only a history of crises" (Hua 6/207)[2]. Moreover, both authors agree on the nature of the problem.

According to Husserl, psychology is fundamentally confused about its subject matter. It merely copies its method from physics, whereas it needs to develop its own (endemic) concepts and method. Unfortunately, psychologists seem to think that they have all the necessary tools to solve the problem due to the success of the scientific method in physics. Despite the fact that "problem and method pass one another by", they believe, the cumulative collection of facts in experiments will sooner or later reveal the answers to all problems of psychology. Thus, the retreat into the 'young science' defence. However, if psychology is "only a history of crises", then "growing older" will not help. The relevance of this remark is echoed by authors in psychology today, who speak of a distinct genre of "crisis literature" within the broader landscape of the psychological literature (Goertzen, 2008; Morawski, 2019; Giorgi, 1976). This genre, however, exists in parallel to psychologists working away in their traditional ways, anchored in the scientific method, feeling safe within the ostensible (methodological) "security".

Yet, (finally) in the recent past some authors in the current debate have actually described the mismatch between problem and method in detail, they came to very similar conclusions as the two German philosophers. Debrouwere and Rosseel (2022), arrive at the

[2] Or according to Husserl, even earlier to the work of Dilthey, (Husserl, Hua 9/5).

conclusions, that the methods of physics are inadequate for psychological investigation. In response to the current debate, they recognise, that "all" attempts to "fix" psychology start from the assumption that "experimental psychology as an approach to the investigation of human behavior is fine the way it is" (p. 14). Yet, from Debrouwere and Rosseel's perspective psychology does not make sense as an experimental science: its interventions lack ecological validity, it uses statistics to whitewash uncertainty and theorises "freely" while being ignorant of some of the most basic facts. They conclude "Those features which make physics successful make psychology fail." (p. 2). In short, psychology is in a *validity* crisis due to copying the method from physics.

Yarkoni (2022) displays how this problem actually "looks like" in modern psychology. He claims that the current replication crisis comes down to a failure to reach *generalisability*. According to Yarkoni, psychologists fail to generate generalisable results from their research, due to the misalignment of statistical methods and qualitative constructs. Yarkoni argues that:

> Most theories and hypotheses in psychology are verbal in nature, yet their evaluation overwhelmingly relies on inferential statistical procedures. The validity of the move from qualitative to quantitative analysis depends on the verbal and statistical expressions of a hypothesis being closely aligned—that is, that the two must refer to roughly the same set of hypothetical observations. (p. 1).

However, according to Yarkoni psychologists fail "to statistically operationalize verbal hypotheses in a way that respects researchers' actual generalization intentions" (p. 1). However, if one does not take care that the statistical expression matches the verbal expression, "then the statistical quantities produced by the model cannot serve as an adequate proxy for the verbal statements […]" (p. 2). Yarkoni shows that the model psychologists most commonly use, – the linear mixed model – commonly does run in to this misalignment problem. Summed up in Wittgenstein's words: *method and problem pass one another by*.

In conclusion: "ironically" the natural scientific method prevents psychology from stepping onto the "secure path of a science" sought by Kant in the preface to the first critique (1998) [3]. There Kant also remarks that if there is no consensus between the different scientists within a discipline, we can be certain that this science is merely groping about and not yet on the secure path. If Kant's assessment is correct, then we can be certain psychology is merely groping about, because the lack of agreement in psychology and philosophy of mind is glaring. I will show that in order to put psychology on the secure path of a science we will need to go beyond the replication or normativity positions. Moreover, psychology cannot copy its method from physics, thus a solution will mean that psychology's method will have to deviate from that of physics. Husserl's *phenomenological psychology* offers such an alternative. First, however, the prejudice which has let psychologist into copying their method from physics has to be uncovered, this will prepare a fertile ground for future conceptual work. Husserl will help us understand why it seemed initially plausible to copy the methods of physics but also why it is ultimately unable to answer truly psychological questions.

Chapter 2: The Real Problem – Naïve Naturalism

In chapter one I argued that most contributions to the debate about the replication crisis do not tackle the issue at its roots. However, should this be correct, how can it be that the vast majority of psychologists are missing the real problem? The answer is: psychologists are unable to question their own point of view. Not in principle, but because their theoretical mistakes are constitutive of their scientific worldview. What they take to be the justification of their method is exactly what prevents them from success. The actual problem is in their attitude as scientists, namely in *naturalism*. This does not seem like a problem to most psychologists, because naturalism is very plausible. In fact, naturalism is virtually the only respected position in the philosophy of mind, to the degree that even those who take Husserl seriously nevertheless fall back into naturalism (Varela, 1997; Petitot et al., 1999).

[3] Originally published in 1787

Psychologists are under the grip of the naturalistic picture and pass it on from generation to generation in their textbooks (Flis, 2018). Indeed, just as Wittgenstein wrote, they feel secure in their method, although method and problem "pass one another by ". This is the root of the *validity* crisis. Why and how naturalism is misleading for psychology will be the topic of this chapter.

At face value, naturalism is the position that all that there is, is nature. It arose together with the scientific revolution and denies the existence of metaphysical realities, because it grounds all that is "acceptable" in the natural world. In detail, I define naturalism following Petitot et al. (1999) as " […]an explanatory framework where every *acceptable property* is made continuous with the properties admitted by the natural sciences" (p. 1-2, emphasis added). In this chapter I will show that this criterion amounts to a mathematisation of really experienced nature. For now, let it suffice that the naturalists emphasize mathematization. For example, Roy et al write: "We see mathematization as a key instrument for naturalization. […]." (p. 42). However, a truly psychological subject matter, psychological facts as psychological, cannot be mathematized. There simply is no mathematically exact description of e.g., an emotion, because it is a "meaningful" state. Therefore, naturalism as an unquestioned assumption plunged academic psychology into a history of crises since its very beginning.

The definition above narrows down the "acceptable properties" as those admitted by natural science. Consequently, naturalism depends on the *scientific method.* Therefore, in order to understand naturalism (and its problems) we need to understand the scientific method and its limitations in detail. For us today, we who are brought up and educated in the scientific world view, it will be difficult to see what could be wrong about the plausible assumption that all there is, is nature. We might even think: "How could there be any better way to study psychology then through the (natural) scientific method?". In fact, it was only after the scientific revolution that a *universal science* of psychology could be envisioned at all. Thus, it

seemed “obvious” to start from the scientific method which was given. However, if we follow the considerations of Husserl (Hua 6 & Hua 9), we will understand that the “nature” of naturalism, regarded as *objectively pre-given*, mind independent and derived purely from experience, is actually already a logical construction, which, despite the sciences’ strong allegiance to empirical evidence, is not strictly empirical (directly experienced). Unquestioned naturalism misleads psychology about the starting points of its investigation and acts as a “habitual mind cuff” (Hua 4/183) preventing psychologists from entering its true field of investigation (Hua 6/253).

Now, I will sketch a historical account of how the scientific method arose, what it amounts to and how it affected psychology as a science. In other words, why it could plunge psychology into “only a history of crises”. In this I will follow Husserl’s historical account as laid down in the *Crisis*, I will add to it my own form of presentation and add the parts of psychology’s history which happened after Husserl’s death. However, I am not a historian, and neither was Husserl, thus my focus is on understanding what the method amounts to and how that affected psychology not to give the most detailed or accurate historical account but rather to use the history as an explanatory tool. Here Husserl and I are forced to idealise the history and describe it through the works of some of the “the great thinkers”, yet their work only functions as a prototypical representation of a way of thinking.

The Problem with Naturalism

Following Husserl, naturalism appears plausible because it transforms naive everyday experience (*natural attitude*) into the *naturalistic attitude*. Thus, it seems like it is simply based on experience and therefore scientifically justified. Yet, in actuality it is an abstraction which absolutizes our naïve experiences and subsumes them under *objectification* / *mathematization* (*Objectivism*). Indeed, in our everyday life, we all experience things as directly given in the world, ”the” (one) world we share with others, which we experience as objectively pre-given. Yet we are also aware of the subjective-relative character of your

everyday experience, what you feel is hot might be cold for me, etc. Husserl calls this straight forward immersion in the world the *natural attitude* and the world we experience in it the *lifeworld*. The unquestioned acceptance of the things in the lifeworld is also known as *naïve realism* (Thompson, 2010, p. 18*)*. The *naturalistic attitude* absolutizes this naïve realism. Through *objectivism*, a "nature" is constructed as exact and pre-given in-itself (Hua 4/183-184) then this constructed "nature" is taken for the really experienced nature. However, this "nature", constructed as mathematical in-itself, is an idealisation not a given experience. A *surreptitious substitution* occurs from the *natural* to the *naturalistic attitude*. My task is now to make this shift of attitude explicit.

We must necessarily start off in the *natural attitude* without any scientific method at first. Here the world is given to us in naïve experience. Yet despite the subjective relative character of our experiences, we believe in "one really existing world". Husserl writes:

> Prescientifically, in everyday sense-experience, the world is given in a subjectively relative way. Each of us has his own appearances; and for each of us they count as [*gelten als*] that which actually is. In dealing with one another, we have long since become aware of this discrepancy between our various ontic validities. But we do not think that, because of this, there are many worlds. Necessarily, we believe in the world, whose things only appear to us differently but are the same. (Hua 6/20)[4]

Now scientifically, we are not interested in the subjective relative but the "really existing" world. Galilei (and probably most of us) thought it was "obvious"/"self-evident" that the things appearing in our subjective experiences are not merely an empty idea of things, but they give account of the true things themselves. Thus, even though our experiences are subjective and relative, our experiences give account of what is true about nature itself. At least, so Galilei thought when it comes to the forms (shapes) of things, which can demonstratively be known apodictically in geometry.

[4] Translations for all Husserl quotes from Hua 6 (Crisis) are drawn from Husserl (1970) in the references.

If we abstract from all sense qualities of experience and narrow our interest towards only the "things" (objects) experienced, then each "thing" appears as a "body", a shape in space[5]. Therefore, geometry lends itself perfectly for the description of the "*pregiven universe of things*" (Hua 6/226-227), which we experience in the natural attitude. What Galilei does is to reduce really experienced "things" (objects) to geometrically idealised objects. Two features of geometry are essential to this method. First, geometry allows us to reach *exactness* which we cannot reach in the lifeworld. Second, geometry implies a certain *universality*. Together they constitute *objectivism.*

In everyday experience, the bodies are not geometrically ideal bodies but 'really experienced' bodies. Really experienced bodies are only more or less circular, straight, rectangular etc., never exact. Yet, in geometry we are imagining perfectly straight lines, perfectly round circles etc., as the mathematical limit [*Limes-Gestalten*] of a process of perfecting the really experienced shapes. These ideal shapes can be determined "in absolute identity" (Hua 6/24) we can recognize them "as substrates of absolutely identical and methodically, univocally determinable qualities." (Hua 6/24) – perfectly straight round etc. Note however: Whereas the theoretical (geometrical) space is *a priori* and *exact*, empirical space and shapes are imperfect (e.g. there are no perfect circles in the *lifeworld*).

The second building block of objectivism is the universality which geometry enables. The key to geometry as a science lies in its *universality* – it is possible to construct all possible shapes and spaces from the basic shapes and spaces, such as straight lines, circles and triangles. Following a few axioms, all the possibilities already exist. Surely, they will have to be discovered inductively, that is, in actual experience, a geometer must construct them one by one. However, their possibility is already implied. All the conceivable ideal shapes can be constructed *a priori* in a systematic method. Thus, geometry is not just the study and

[5] This later leads Locke to speak of primary (mathematical, e.g. number, size, shape) and secondary qualities (sense qualities, e.g. colour, sound, etc.).

determination of particular shapes, but the universal determination of *all thinkable* shapes in space according to a method. It is like that in mathematics in general.

Applying this to nature, one arrives at the conception of a natural world which is ”exact” and can be reduced to a few fundamental axioms, the formulas, the “laws of nature”. This is why mathematisation is the key to naturalism. Of course, the individual cases have to be empirically discovered. Yet the whole universe is subsumed under the mathematical *a priori* all at once. According to Husserl throughout the centuries this was the hypothesis; “everything is decided in advance as pure mathematics […]“ (Hua 20/268). Thus, a supposedly independently existing objective “nature”, is constructed. Surely, it will have to be discovered inductively in experiments one after another. Yet, like geometry it is exact and pre-determined all at once. This makes the shift from the *natural* to the *naturalistic attitude*. A *surreptitious substitution* has occurred. The world of naïve realism has been absolutized as mathematically exact and pre-given in all its determinations (which are only inductively determinable). In other words, it is *objective.*

Moreover, this application of geometry to nature enables the art of objective measurement. According to Max Planck “What can be measured that exists.“ (Schlick, 1920, p. 23, translation), as far as the physicist is concerned, and the same attitude drives all naturalistic empiricism. Through measurement, *objective relativities* – relativities between objects –, also known as reference “point(s)”, can be established. Thus, the subjective experiences of individuals are overcome, and an objective “truth” (a measurement) can be established. Consider the most basic measurements of space as a first illustration. The simplest case of a spatial measurement device is a measuring rod. A measuring rod establishes the size of objects by coinciding the measured object with the tick marks on the rod. Assuming the rod remains equal in size, one can measure the size of other objects relative to the measuring rod (reference object) and arrive at a standardized measure and procedure. Paring this procedure with assumed geometric exactness (e.g., we assume the rod is perfectly

straight, not just more or less straight), allows us to convert measured relationships into geometrically idealized relationships in an ideal space. This allows us to make predictions based on geometric (ideal) relationships in the universal mathematical nexus, e.g., the Pythagorean theorem. In other words, we can calculate as of yet unmeasured relationships based on the exact relationships of geometry. Galileo thought: "Wherever such a methodology is developed, there we have […] overcome the relativity of subjective interpretations […]" and "[…] we recognize something that truly is – though only in the form of a constantly increasing approximation." (Hua 6/27). In short, we can truly know the world with this method and in ever increasing approximation describe and predict its geometric forms.

Only what are we to do with the qualitive aspects of our experiences, which do not straightforwardly concern spatial relationships? It is obvious that our experiences of quality are merely subjective and relative. For example, the experiences of hot and cold. One just has to consider the classical experiment by John Locke where the left hand is put into cold water and the right hand is put into warm water for a while, before both hands are held into lukewarm water. We know how the experience of temperature in the hands is reversed in the lukewarm water. Thus, how does geometry allow us to get from this relative experience of temperature to the "true nature"?

Here, we have to observe that we do not only encounter the "things" in the natural attitude as simply given in isolation and unchanging. On the opposite we experience them in connection and relation with other things and in constant change. The world as a whole has a certain "style" of change one that we continually observe, and we "know" will continue to persist in every new concrete situation. We know "*a priori*"; the world will continue to change in the same style as it always has changed. Husserl sums up: "[…], through a universal causal regulation, all that is together in the world has a universal immediate or mediate way of belonging together; world has an empirical over-all style." (Hua 6/29) This universal causal style is what guarantees that we always experience the "one" world. No

matter how the concrete situations change it is within the same style – the same "one" world. This style makes hypothesis (inductions) about this world possible. Subsuming this causal style under the universal mathematical *a priori* led to the idea of a clockwork like deterministic universe. The causal style is now seen as a "the" causal law.

If there is only one world, the style of change must include not only the changes in shapes and form, but also the changes in sensible qualities such as temperature. Thus, even though the sensible qualities are not geometric shapes and therefore not directly mathematizable they must be indirectly mathematizable. They must stand in a regular (law like) relationship with the phenomena of shape. In other words, they must be reducible to them. Even though, it does not actually logically follow from the universal causal style that the phenomena of quality are totally dependent on those of shapes (they might be independently determined), Galilei and the spirit of his times saw the world itself as mathematical and objective, thus they thought the qualities surely would be indirectly mathematizable and therefore objectified, if the correct measurement methods would be developed.

And indeed, the qualities can be reduced to the same measurements of "bodies" we are now already familiar with. Consider the example of temperature to illustrate the fundamental reduction to geometry even more clearly. In order to rid temperature of all the subjective relative qualities (what is hot for me might be just lukewarm for you etc.), objective relativities (relativities between objects/bodies) are needed. Then temperature can be measured objectively. For example, through the extension of mercury in a tube, formerly a common type of thermometer. No matter what we might feel, the mercury is assumed to extend and shrink in a lawful manner. Just like the measuring rod is assumed to be of equal size at all times, the mercury is assumed to extend equally under the same conditions. Thus, the phenomenon has been geometrized; we can use bodily extension – change in geometric form – of the mercury and how it coincides with tick marks on the scale to make objective

statements. Similarly, all other phenomena are brought under mathematical description in physics (e.g., sound waves, light waves, etc.). Naturally, the development of these actual measurement methods for the qualities placed even greater trust in the correctness of the scientific method.

Lastly, now that the whole of nature, including the qualities, have been brought under geometric description we must speak of formulas as the true touchstone of scientific theory. Through an arithmetization of geometry, the geometric ideals can be expressed in numbers. Through numbers, the geometric relationships can be described in algebra, in other words formulas. These formulas are the true touchstone of scientific success, because they allow for the prediction of outcomes in the everyday world. Formulas allow for approximation of unmeasured relationships, purely "on paper". For example, the calculation of a rocket's trajectory to the moon. Due to the success of these predictions, we might start to believe formulas are dealing with the empirical world directly. Indeed, they predict the phenomena in the lifeworld very well and many *technologies* could be build based on scientific insights. The *universality* with which these formulas can be applied seems to lift the assumption of "the one objective nature" from a mere hypothesis to a fact.

Surreptitious Substitution*: *The lifeworld as The Meaning-Fundament of Natural Science

As a consequence, Husserl concludes: "One can truly say that the idea of nature as a really self-enclosed world of bodies first emerges with Galileo." (Hua 6/61). The world and its "*a priori* causal style" are subsumed under the mathematical description. Under the assumption of causal closure nothing in "nature" occurs by chance but it already follows the exact laws, the clockwork like deterministic universe is born. Yet, a *surreptitious substitution* has occurred, the shift from the really experienced bodies to the ideal shapes of geometry is forgotten. The mathematical descriptions "dresses up" the really experienced intuitively[6]

[6] Through this text *intuition* goes back to the German word *Anschauung* and is a technical philosophical term. It does not mean what is commonly understood by intuition as a kind of "pre-monition" the German word for

[*anschaulich*] given in the clothing of " "objectively actual and true" nature."(Hua 6/52), not seeing through the mathematics to their *meaning ground* [*Sinnboden*] "we take for true being what is actually a *method*" (Hua 6/52).

Nevertheless, scientists are aware that their formulars, theories and hypotheses are only every hypothesises awaiting falsification, because they are only approximations of the objective "nature". Every theory can be falsified and improved up on by a more accurate theory "closer to the truth". With the advance of technology our measurements get more and more "perfect" and thus we can make more and more accurate descriptions of nature. For example, by cutting it into smaller and smaller "fundamental objects" (particles) such as atoms, electron, quarks etc. Therefore, all scientific theories only ever have the character of hypothesis, open to falsification in a process of ever-increasing approximation of the one really existing "objective world".

However, the fact that the "nature" of naturalism is only a logical construction based on mathematical idealisations is not as clear. Instead, objective "nature" as mathematical in-itself is adopted unquestioned. "Thus all the occasional (even "philosophical") reflections which go from technical [scientific] work back to its true meaning always stop at idealized nature; they do not carry out the reflection radically […]."(Hua 6/50). A radical reflection would lead them back to the prescientific lifeworld in which there are no idealised objects. It is as if they were *mistaking the map for the territory*. Consider the geographic coordinate system as an analogy. Through the coordinate system the earth is covered in a grid of lines dissecting it into latitude and longitude, the lines are only imagined, yet they are conventionally adopted by most of civilization. Everything about the geometric coordinates is exact and can be known *a priori*. Yet, nothing about a particular empirical location is exact (Wittgenstein, 2013, 6.341, 6.342, 6.35).

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this would be *Intuition*. However, Husserl uses the German Anschauung. The Latin etymology of the word *intuition* defines how the word is used here by Husserl [*looking at, immediate cognition*].

First and foremost, objects and qualities are known to us from the *lifeworld*. Scientific measurements reduce all observations to geometrical relationships. However, what cannot be eschewed from any objective measurement is the fact that a scientist needs to read off the results from the measurement devices. Therefore, a scientific measurement is an event in the *lifeworld*. Moreover, nowhere do the sense qualities, for example, the experience of temperature, feature in the scientific explanation. Temperature simply is said to covary "exactly" with the extension of mercury. Nevertheless, we only "know" what temperature is from our experience of warm and cold, and that is relevant. In other words, subjectivity features uncritically in every scientific measurement. First, as the only way to make an "objective" measurement, e.g. Einstein never had to explain the psychophysical laws which allowed him to know the outcomes of the Michelson-Morley experiments[7], he was allowed to take all of the measurements uncritically. Second, as the meaning-ground [*Sinnboden*] of all scientific investigation, temperature is interesting to us not only because of its covariance with extension but as phenomenon in itself, as it is experienced in the lifeworld. Whereas the lifeworld is directly and evidently given, the logically constructed "nature", in as far as it can count as true at all, is only true in so far as it recurs to the evidence of the lifeworld. In other words, all of science is grounded in the pre-scientific experience, the lifeworld is the foundation of science. However, this foundation itself has never been scientifically investigated. Thus, Husserl argues that the taken for granted world, (the measurement devices the scientists the institution's rooms etc.) feature in the sciences as unquestioned premises, a truly radical empiricism would have to take experience more seriously and investigate the pre-theoretical unidealized experiences themselves. And, in psychology this means we have to first see how souls (/minds) are given in the *lifeworld*.

Moreover, Husserl points out, with this surreptitious substitution of "*true being*" for "what is actually a *method*" (Hua 6/52, emphasis added), something curious has happened to

[7] Einstein's Special Relativity is a solution to the problems which arose due to the outcomes of the Michelson-Morley experiments.

science. It has turned in to a *τέχνη (technique),* "that is, it becomes a mere art" (Hua 6/46), as opposed to a science *ἐπιστήμη* (*episteme)*. The art of describing the world through idealisations *more geometrico* (Hua 6/60), amounts to a *superficialization of meaning* [*Sinnesveräusserlichung, Sinnentleerung*](Hua 6/42-48). It does not generate knowledge of the world in-itself as it really appears in intuition [*Anschauung*] (Hua 6/48-54). According to Husserl, "Even ancient geometry was, in its way, *τέχνη*, removed from the sources of truly immediate intuition and originally intuitive thinking, sources from which the so-called geometrical intuition, i.e., that which operates with idealities, has at first derived its meaning." (Hua 6/49). Yes, physics and with it all natural sciences have great success in predicting the world and lead to actual applications in *technology*. However, it is forgotten, that all science *derives its meaning* from the truly experienced world – the lifeworld –, and so does psychology.

Therefore, all the occasional reflections "always stop at idealized nature", a radical reflection is never carried out. The *naïve realism* of the natural attitude is simply absolutized. Through the success of natural sceince *naturalism* (every "acceptable" property is defined by the scientific method) and o*bjectivism* (everything is objectively (exactly) given) came to dominate academia. Until today many scientists simply take naturalism as a truth. The ability to reduce phenomena of quality to geometry lead most scientist to adopt re*ductionism* where all that is naturalistically explainable must be reducible to the self-enclosed material world of bodies as introduced by Galilei. The new science of physics soon influenced the study of the soul and a new equally universal study of psychology as its self-enclosed field could be envisioned. However, in the absence of a truly radical reflection psychology was encumbered with the role model of physics until today (Debrouwere & Rosseel, 2022). Since its conception it has continuously tried and failed to live up to the glory of its role model, because it was faced with an *impossible task, the mathematization of the psychical (spiritual)*. Hence, psychology was bound for a history of crises.

Statistical Psychology of Today

Given the universal mathematical *a priori* of "nature", a *"cooperative interplay between experimental and mathematical physics,*" (Hua 6/48) is possible: The further "physics has gone in the actual mathematization" (Hua 6/47) of the lifeworld, "the greater is the range of its possible deductive conclusions concerning new facts of quantified nature" (Hua 6/47) they point towards further verifications to be made in experiment or observation. On the one hand, (theoretical) mathematical physics draws the logical conclusions from the whole "known" system of laws. On the other hand, experimentalists overtake these mathematical conclusions and testes them as new hypotheses (precisely quantified predictions) in experiments. This allowed, for example, Einstein's theory to supersede Newton's when during a 1919 solar eclipse Eddington observed that the angle of light emitted from stars "behind" the sun was in accordance with Einstein's but not Newton's predictions, an effect due to gravitational lensing (Debrouwere & Rosseel, 2022).

Assuming an equally objective universality for the mental, psychology adopted the experimental method as a gold standard. Psychology thought; experiment and observation ought to generate equally conclusive evidence in their discipline. Like in a physics experiment Psychologists try to isolate their phenomenon of interest and test their null hypothesis against alternatives in experiments. Yet, whereas, physics has a universal mathematical nexus as its *a priori* (and thus all formulas are in connection), there simply is no analogous mathematical *a priori* of psychology. In fact, psychological theory is such that for most experiments' predictions are usually (1) solitary and (2) vague (Debrouwere & Rosseel, 2022). According to Debrouwere and Rosseel (1) means, , that an outcome in one experiment is only loosely connect to other psychological "theories" and (2) means "theories" postulate only "that a relationship between two variables will be found, but not the magnitude of that relationship." (Debrouwere & Rosseel, 2022. p. 10). All in all, not a single Psychological formular has stood

the test of time[8]. Thus, in psychology the mathematisation cannot have the same sense as in physics where the goal are formulas.

Nevertheless, psychologists insist on the mathematization of their subject matter, because: how else could there be an "exact" (and therefore objective) measurement? Far removed from Galilei's conscious geometrization of nature, psychologist speak of *quantitative research*. Today's statistical psychology does not look like geometry but still boils down to an adaptation of Galilei's *technique*. Psychologists invented their own reference objects e.g., tests and questionnaires and then with the use of *statistics* they test them against chance (null hypothesis) or refences groups. However, every response on a questionnaire or manipulation that elicits a behavioural response is only an indirect "access" to the mental. Psychologists call this *operationalisation*. In order to quantitatively measure psychological constructs like language acquisition or working memory, psychologists invent operationalizations of those constructs, for example, how many words a child has learned by age 3 or a performance score on a memory test, etc. (Yarkoni, 2022). In this way they assume to have achieved what e.g., a thermometer achieves for temperature – an indirect mathematisation. The most extreme philosophers claim that ideally all psychological processes could be eventually reduced to neuroscience. However, this is not the case. There simply is no analogue to exact measurement for, e.g., an emotion, there is no measuring rod that one can hold next to an emotion, because it is a "meaningful" state. We will investigate a psychology that can deal with meaning in the last chapter, and we will see why the mathematisation cannot be carried out. All this is not to deny that there is validity in the psychological method. A biological investigation of the full body might indeed trace an emotion to precise bodily states and identify when a person is in a certain emotional state. Already, researchers are partly able to decode ("mind read") what a person sees, for example,

[8] Though Curt Lewin suggested a formula, his B = F (P,E) is not quantifiable.

with the help of FMRI and deep neural networks (Shen et al. 2019). Moreover, psychological findings (e.g. Norms or Big 5) successfully feature in political campaigns, marketing etc.

However, Husserl stresses *not all empirical research is already a science*. He grants that all *empirical inquiry* has its legitimacy and its dignity. However, if it fails to reach knowledge of its subject matter as it is "in-itself", then it is merely a *τέχνη (technique)*. Consider an analogy with weather forecasting. Yes, weather forecasts are empirical research, and they get more accurate the further human technology advances (satellites, etc.). Yet, it is not a fundamental science, but rather the application of physics and technology to this particular domain. Like weather forecasting, psychophysics and statistical psychology deserve respect and have applications. However, statistical analysis and psychophysics are not yet psychology. But even understood only as such *τέχνη*, psychology fails to be replicable on the whole (Debrouwere & Rosseel, 2022; Yarkoni, 2022). One could claim that this is what the replication crisis is about from the perspective of most authors. To them it is a discussion about the failure of the *τέχνη* to reach the legitimacy that it actually can have. Certainly, there are problems with the rigor of the and the culture surrounding the *τέχνη* and they need to be addressed. However, psychology, in particular, fails to reach the generalisability it claims to reach, because it thinks it can be universal in the sense that physics is (as if it was the same *method*/*technique*) (Debrouwere & Rosseel, 2022; Yarkoni, 2022).

The replication crisis comes down to a failure to acknowledge that psychology is *τέχνη* and how it actually operates. It is assumed that hypothesis tested in a single experiment can be generalised just like the formulas of physics. Yet Yarkoni (2022) demonstrated that psychological studies fail to reach this generalisability, due to a miss alignment of statistical method and qualitative constructs. With the unquestioned trust in their *mathematizations (quantifications)*, psychologists seem to think that "Statistics is […], a rote, mechanical procedure for turning data into conclusions.". (p. 2). However, if the statistical expression does not match the verbal expression of the psychological constructs, "then the statistical

quantities produced by the model cannot serve as an adequate proxy for the verbal statements […]" (p. 2). Here he does not mean that psychologist fail to operationalise their constructs properly, but that they fail to align their generalisation intentions with the statistical methods.

In a nutshell psychologists fail to randomly vary all the factors over which they intend to generalise. Even though psychologist rely on *inter-subject variability* (sampling multiple subjects and modelling "subject" as a random factor) in order to generalize the effect to the population, they fail to do the same for almost all other factors involved in their experiments. Stimuli, tasks, or research sites, for example, are "Common design factors that researchers hardly ever vary, yet almost invariably intend to generalize over," (p. 7). This he argues can greatly inflate false positive rates and invalidates the generalisation across those factors, which are almost always implied in the results of a psychological experiment. Yet, in fact, most statistical analyses only warrant very limited conclusions. Yarkoni claims often "[…]one must effectively equate the construct […] with almost exactly the operationalization tested" (p. 11), even *down to the exact same stimulus*! Therefore, he stresses that replication efforts, which do not effectively establish generalisability are doomed to be a waste of time and resources. Even if they establish that such and such effect actually exists, it might amount to nothing more than a particular operationalisation, with no ecological validity. Yarkoni concludes that much of psychology, thus, amounts to what Feynman called *cargo cult science*[9] – "an obsessive concern with the superficial form of a scientific activity rather than its substantive empirical and logical content" (p. 12). By slapping a p-value on their constructs they make them seem scientific to the untrained observer yet fail to reach any meaningful generalisations worthy of a science. Therefore, Debrouwere & Rosseel (2022) argue that psychology should abandon the model of physics (*aristocratic induction:* reasoning from the specific experiment to the universal law) all together. Psychology should abandon its obsession with theory and acknowledge that it will have to simply stick to measurements or in

[9]A polite way of calling something a pseudo-science.

the authors' words, *plebian induction*: induction by enumeration of observations. In other words, psychology should embrace its status as a mere *"empirical inquiry"*.

If, the confusion of psychology with physics would be resolved. Then psychology could continue to use its current methods but with an understanding of the limitations. It would simply have to be more rigorous in limiting generalisation intentions or where possible employ more expansive statistical models. In analogy weather forecasting does not make universal claims. Psychologist could simply do the same and a lot of their research would not even be expected to be replicable, like a weather model is only meant to be predictive for a certain time and a certain area. However, for Husserl this is not enough, he suggests that a true science can be reached. In the next chapter, I will first continue the historical elucidation of how naturalism kept psychology trapped, in order to prepare the reader for Husserl's non naturalistic alternative.

Chapter 3: Psychology's History of Crises

The kind of engagement with theory I am putting the reader through here might seem a little confusing for psychologists of today, because they do not necessarily engage with any of the theoretical foundations of their field. Instead, they often focus only on the literature in their particular niche of psychology, as is evident from the reference sections in psychology papers. They, simply inherent their method through the textbooks and the universities (Flis, 2018) without reflecting on the validity of this method. Regardless, there have certainly been theoretical *"revolutions"* in the history of psychology, and they evidently do affect the work of psychologists whether the individual psychological researcher reflects on them or not. these paradigms such as introspectionism, behaviourism, etc. will be guiding our historical elucidation.

After Galilei introduced the "really existing world of bodies" as a starting point for all sciences, the world was split into two, the objective "nature" and the merely subjective relative experiences. "Galileo abstracts […] from all that is in any way spiritual [*geistig*]"

(Hua 6/60, brackets added). Thus, psychology was burdened with an *inner tension* between subjectivity and objectivity (Hua 6/§61; Vygotsky, 1934). In other words, it was burdened with the question how to gain objective knowledge about subjective experiences after abstracting from all the subjective qualities? This lead, to a view of the soul as "consciousness space" dependent on or produced by (so to say attached to) a material body. Thus, souls/minds are given as apart (extended [*Auseinader*]*)*, each one connected to a body and not as one *pure self-enclosed field* which would be a true parallel to the universal "*nature*" (Hua 6/258). Therefore, psychology is viewed as the study of induvial minds, who's subjective experiences are mediated by the particular physical makeup of their body (with its nervous system). Whereas, the physical world is seen as a universal whole, the Soul/mind is a not seen as a universal field (Hua 6/234). *The fundamental tension* between the objective and subjective has been the battle ground for every revolution within psychology (Introspectionism, Behaviourism, Cognitivism, Enactivism). Nevertheless, in every revolution, psychology remains unable to solve its fundamental problem, because it continuously takes naturalism as a scientific necessity. Naturalism forces it to the *impossible task* (the mathematization of the psychical).

Descartes' Dualism to Locke's Sensualism: The Soul as a "Consciousness Space"

Cartesian Dualism is a direct consequence of Galilei's completion of the scientific method. The new method suggested that a complementary abstraction – an abstraction from all the bodies – would reveal the purely psychic realm which could then be studied with the exact same methods of observation and experiment. With Descartes this view finds expression in his substance dualism. Descartes distinguishes mind (*mens*) and body (*corpus*) as two different substances *res cogitans* and *res* extensae. Descartes assigns to the psychic an existence parallel to that of "nature's" extended bodies, the soul is seen as an equally real substance supposedly governed by laws just like nature. It is then the task of psychology, to study the laws to which this substance is subject. Thus, the world was now seen as split into

two strata governed by causal laws, nature and souls. Souls “seen as real annexes of their physical living bodies” (Hua 6/218) must similarly be investigated in terms of “causal laws”. Soon this view was transformed into a physicalist psychology by British empiricists they reinterpreted the two substances as two different forms of experiences. Namely, “inner” and “outer” experience.

In “outer” experience physical *exact* nature is given, whereas psychic being, the subjective, is given in “inner” experience. Consequently, only “inner” experience is within the scope of psychology. For Locke introspection reveals the soul in “[…] the self-evidence of self-experience, with its inner states, acts, and capacities. Only what inner self-experience shows, only our own "ideas," are immediately, self-evidently given. Everything in the external world is inferred.” (Hua 6/86) We see, for Locke, only “inner” experience is truly psychological experience. “What comes first, then [for Locke] is the internal-psychological analysis purely on the basis of the inner experience” (Hua 6/86-87, brackets added). This gives rise to a view of the psychological subject matter as a “consciousness space”. Husserl assigns to Locke the view that:

> The soul is something self-contained and real by itself, as is a body; in naive naturalism the soul is now taken to be like an isolated space, like a writing tablet, in his famous simile, on which psychic data come and go. (Hua 6/78)

This view of the psyche as “inner” space in which the “outer” world appears as sense data was passed on in the tradition of psychology and continues to impact it today.

However, Locke continuously uses the “nature” of the objective sciences quite naively. Locke is unaware that both “inner” and “outer” experience remain vague concepts. He never made it clear to himself that sense data from the outside world are problematic as soon as all experience of “outer” is merely another sense datum on the whitepaper. How are we to infer from “inner” experience to “outer”, if we are forced to make the inferences from within? How could one ever escape psychological experience? For Locke “[…] the whole

investigation proceeds as an objective psychological one, indeed even has recourse to the physiological – when it is precisely all this objectivity, after all, which is in question." (Hua 6/87). These problems were not felt by Lock and natural world was continuously granted as an unquestioned premise. However, these problems were thematized by Berkley and Hume, which culminated in the Humean scepticism (known from the problem of induction), for which the whole world (the scientific and the lifeworld) is merely an illusion. Hume's scepticism then gave rise to reflections on the mind such as Kant's. However, I do not want to speak of philosophical problems here, where I am only concerned with the view psychologist continuously employed. All in all, according to Husserl (Hua 6/208) psychology developed a view of itself as a science that investigates psychophysical realities as divided in to real "strata" united in the human or animal. However, "Here all theoretical thinking moves on the ground of the taken-for-granted, pregiven world […]" (Hua 6/208). Only the interest is directed at the souls which are seen as an equally real aspect, while the other aspect the physical is already known (or to be known according to the method). Thus, the psychic aspect was supposed to be known in the same way it was supposed to be subsumed under laws like the natural laws. While the focus on laws has been given up (due to failures), this self-view of the mind as a real aspect attached to the bodies a "consciousness space" in which the sense impressions are processed remains active with the consequence of a focus on individuals until today.

Introspectionism

Even though they prepare the view psychology has of itself, neither Descartes nor Locke can actually be seen as the starting point of a truly scientific psychology. It was only when the first psychology laboratory was opened, in 1872, that psychology seemed to have

matured as a true scientific discipline. Wundt's Introspective method was institutionalised and spread across the globe.[10]

In his *Outlines of Psychology* Wundt (1897) takes the two views from above, as starting points for his discussion of Psychology. On the one hand, there is the view associated with Descartes, where psychology investigates the law of a "mind substance". And on the other, there is the view of Hobbs and Locke, where the psychological subject matter are the laws of "inner experience" (the laws of association of mental states). He takes both of them to be unsatisfactory. The first one because a "mind substance" is a metaphysical supposition and not an empirically testable hypothesis. In other words, it is not naturalistic. The second one because all of experience is not to be distinguished into two separate senses but given in just one unitary experience including the phenomena of the external world. According to Wundt, "there is not a single natural phenomenon that may not, from a different point of view, become an object of psychology." (p. 2). For Wundt it is evident that all natural phenomena are experienced in a psyche. Hence a stone, a plant, a ray of light and other natural phenomena are objects of psychology "In so far […], as they are at the same time *ideas.*" (p. 2). Wundt emphasizes that there are phenomena of experience which the natural sciences do not deal with, for example feelings, emotions, and decisions. However, they arise together with the experience of natural objects. They [feelings, decisions etc…] are "not known through special organs but are directly and inseparably connected with the ideas referred to as external objects." (p. 2). Therefore, Wundt asserts "the expressions outer and inner experience do not indicate different objects, but *different points* of view (abstractions) from which we take up the consideration and scientific treatment of a unitary experience." (p. 2).

At all times, this unitary experience is a combination of two factors, a content and an apprehension of this content. According to Wundt, the first of these factors we call *objects of*

[10]I should also treat of Psychoanalysis for a whole history of psychology. However, Psychoanalysis was split from academia early on in its history and will thus not be covered here. (Maybe it was split off, because it deals with the mental as symbolic (as meaning) and thus steps on the non-naturalistic path)

experience, while we refer to the second as the *experiencing subject*. In natural science we are only dealing with the objects of experience after *abstracting* from the subjective factor, whereas psychology has as its content the whole content of experience. Therefore, Wundt calls the perspective of natural science mediate experience (experienced by abstraction) and the psychological perspective immediate experience. Since psychology takes the immediate reality of experience as its subject matter Wundt says it is more strictly empirical than the natural sciences. Here Wundt is in agreement with Husserl, because he sees the natural sciences already as an abstraction from the one unified experience, as I have shown in chapter two. Wundt describes his focus on immediate experience as more radically empirical than the classical empiricists. Here he is in agreement with Husserl who says the same about his focus on lived experience (Hua 6/252).

However, even though Wundt like Husserl focuses on immediate experience as the psychological subject matter, Wundt adheres to a parallelism of method and thereby reintroduced (though in a reinterpreted sense) the split world of naturalism. Wundt argues, that because the facts of mediate experience (scientific abstraction) and the immediate experiences (of psychology) are merely components of one single experience, only seen from two different points of view, they must necessarily be related: “Since these facts belong to both spheres, there must be an elementary process on the physical side, corresponding to every such process on the psychical side. This general principle is known as the principle *of psycho-physical parallelism*.” (p. 318-319). The *psychophysical parallelism* reinterprets “inner” and “outer” experience as two points of view onto the one unitary experience which are supplementary to each other in such a way, that every physical phenomenon has a corresponding psychical point of view and vice versa.

Husserl attacks this as merely a reinterpretation of dualism into a naturalistic dual aspect monism, (a form of Spinozian parallelism[11]), but not an answer to dualism. In effect this psychology based on a *psychophysical parallelism* follows the same methods as the natural sciences, thereby reaffirming the parallel existence of the soul as another "object" equally *objective* as "nature". Methodologically, therefore it attempts the impossible mathematical idealisation of the mental. Indeed, Wundt (1897) writes:

> […]this form of psychology cannot admit any fundamental difference between the methods of psychology and those of natural science. It has, therefore, sought above all to cultivate experimental methods which shall lead to just such an exact analysis of psychical processes as that which the explanatory natural sciences undertake in the case of natural phenomena, the only differences being those which arise from the diverse points of view. (p .9)

Here Wundt stresses, that same "exact" methods used in natural science, *observation and experiment*, must also be used in psychology. Therefore, psychology in Wundt's time developed a psychophysical method, were physiology and psychology are correlated. Wundt thinks of his introspective method like "chemical analysis": Through introspection a stream of consciousness can be observed and then split into simple parts forming compounds and interconnections between compounds, which explain the subjective experiences just like chemical analysis splits the natural world into its parts and explains the properties of objects. Despite Wundt's rejection of psychical atomism, the parallel to the Galilei's world of bodies is obvious.

Ultimately this teaching of the two point of view commits the problematic fallacy of assuming the mental world to be subsumed under a universal causal order just like "nature". For Wundt, the final task of psychology is to investigate "an *independent psychical causality*, which is related at all points with physical causality" (p. 320). In other words, the mental

[11] Spinoza, too, claims that we can consider everything as having two *attributes*, that of extension and that of mind.

sphere is seen as parallel to the physical with its own form of lawful causality. However, what is justified and practical in the natural science – the mathematical dresses up and the assumed universal causal order – is ill advised in psychology. The mere reinterpretation of dualism into a monist parallelism runs into a problem because there is no possibility for an exact measurement on the psychological side of this parallelism.

Wundt came close to Husserl, yet, without the transcendental reflection there is no way to reach consensus on the essential structures of consciousness. Therefore, it did not take too long before Introspectionism was critiqued for trying to do the impossible. In what is now known as the *Behaviorist Manifesto*, Watson (1913) rightfully points out how the introspectionists failed to arrive at a consensus about their psychical categories. Since psychology deals with meaning there is no equivalent to the "exact" measurement of natural science in the psychological subject matter. It is impossible to come to an exact agreement through introspection. Yes, Wundt managed to start an experimental psychology with its distinguished methods and laboratories around the world and for the first time it seemed like psychology had attained the status of a secure science. Yet, despite the fact that interesting facts about psychology and psychophysics had indeed been discovered. Psychology underwent a behaviourist revolution shortly after, because the "exact" observation of the mental was not possible.

Behaviourism

In the "Behaviourist Manifesto" Watson (1913) criticised the introspectionist psychology for not establishing itself as a true natural science. Instead, Watson claims, this form of psychology "has something esoteric in its methods". Whereas in sciences like physics and chemistry a failure of reproducing results is attributed to the experimental setting, Watson laments that introspectionisits reverted to scientifically unacceptable claims such as:

> If you can't observe 3-9 states of clearness in attention, your introspection is poor. If, on the other hand, a feeling seems reasonably clear to you, your introspection is again faulty. You are seeing too much. Feelings are never clear. (p. 163)

Hence the introspection of the replicating scientist is what becomes a point of contention. Yet, there is no consensus on the concepts introspectionists of different schools were using. Watson writes: "There is no longer any guarantee that we all mean the same thing when we use the terms now current in psychology. "(p. 163-164). Watson doubts that a psychologist's description (or definition) of a psychological concepts, such as e.g., a *sensation*, will find even three psychologists of different training in agreement with this description. The concepts are too vague. In the case of sensation for example the attributes of quality, extension, duration, and intensity, might be considered as important by some then another might add clearness or order and so on. Even though some psychologists, such as Titchener (a student of Wundt), believed that these disagreements were due to the young age of psychology and would be resolved over time, Watson was less optimistic. He believed that not even "two hundred years from now "(p. 164) the disagreements could be resolved, because of essential shortcomings of the introspective method. Give that psychology cannot be subsumed under a mathematical *a priori* one must agree with Watson. Indeed, for essential methodological reasons, there simply is no way to conduct a measurement in introspection that is analogous to the "exact" measurements in physics and chemistry.

However, Watson suggested a naturalistic alternative to the introspective method – Behaviourism. According to Behaviourism, psychology "is a purely objective experimental branch of natural science. Its theoretical goal is the prediction and control of behavior." (p. 158, Watson, 1913). Watson claims that psychologists were merely deluding themselves when they were thinking that mental states are the object of their investigation. Rather than wrestling with "speculative questions concerning the elements of mind and the nature of

conscious content" (p. 163), psychology should tackle questions in terms of behavior only; "keeping all of the results on a purely objective plane." (p. 170).

As an illustration, consider Watson's example of an animal reacting to two different kinds of mono-chromatic light. The animal is fed at the one type of light and punished at the other. Pretty quickly the animal learns to approach the light where it is fed and avoid the other. According to Watson, we need not attribute to the animal a conscious experience of seeing colour (psychological explanation). What interests the behaviourist is only whether the animal adjusts its behaviour according to the wavelength or the intensity of the light. Then one can experiment to what kinds of light does the animal manage to adjust its response. For example, can it respond to wavelengths which human beings do not respond to? However, we are not more interested in comparing the animal to humans than we might be in comparing it to chickens. The gist of this example is that human psychology should be studied like animal psychology. In the human case, too, we do not add to the understanding if we attribute a conscious experience of colour and introspect into our colour experience[12]. Instead, Watson claims focusing on the "purely objective plane of overt behaviour" allows us to put all psychological studies in the same terms, for man an animal alike.

Thus, Watson attempted to rewrite psychology in behaviourist terms in order to reach the scientific consensus which Introspectionists had failed to reach. Following Watson, we need never go back to use terms such as "consciousness, mental states, mind, content, introspectively verifiable, imagery, and the like." (p. 166). Instead, we can arrive at an exact psychology purely written in terms of stimulus and response, habit formation, habit integrations, and the like. This would allow us to do away with the assumption of consciousness and the unreliable introspective psychology. We would merely have to take "the observable fact that organisms, man and animal alike, do adjust themselves to their

[12] Watson does add, instead of feeding and punishing the human, we can use language as measure of response. However, language is merely an abbreviation, which does not change anything about the essentials of the method.

environment by means of hereditary and habit equipment" (p. 167) as a starting point and that "certain stimuli lead the organism to make the responses." (p. 167). Through understanding the relationship between adjustment and the stimuli calling them forth, Behaviourism sticks to lean methods by which behaviour can be controlled. Moreover, Watson promised that the behaviourist results are more readily applicable than those of Introspectionism. In education, medicine, law and business, behaviourist findings and methods could be applied as soon as the data were experimentally obtained.

Watson's critique and his positive alternative were so effective that psychology transformed. It adopted the behaviourist method almost exclusively until the 1950 (Kelly et al., 2007) and it remained influential much longer. Indeed, it is easy to see how Behaviourism remains completely within the realm of naturalism/natural science, and this gives it its convincing force. In fact, it is a solid naturalistic research program[13] which focuses only on the experimentally observable. However, it comes at the cost of ignoring the concept of consciousness, which was previously believed to be the central concept of psychology. In fact, consciousness became known as the C-word within psychological institutions until the late 1980's (Dehaene, 2014), because Behaviourism seemed to have shown that consciousness was not open to experimental investigation. This position seems odd: can psychology really deny the experience of consciousness all together? Is Behaviourism really a psychology? Does it suffice to reduce psychology to behaviour? Watson discusses the questions of the use for the term consciousness in the behaviourist paradigm toward the end of his manifesto.

> The plans which I most favor for psychology lead practically to the ignoring of consciousness in the sense that that term is used by psychologists today. I have virtually denied that this realm of psychics is open to experimental investigation.
>
> If you will grant the behaviorist the right to use consciousness in the same way that other natural scientists employ it—that is, without making consciousness a special

[13] So solid in fact that behavioural biology is still a thing in 2022

> object of observation—you have granted all that my thesis requires. (Watson, 1913, p. 175)

All in all, Watson had the insight, that for essential reasons the psychic is not "open to *experimental* investigation" (emphasis added). However, his solution simply subsumes all of psychology in the objective side of the tension.

This view seemed unsatisfactory to many psychologists, because it seems like a psychology without consciousness is unnecessarily narrow. Chomsky remarked: "Defining psychology as behaviourism was like defining physics as the science of meter reading." (Miller, 2003). Hence after a time of dominant reign for behaviourism, the other side of the tension pushed itself back upon the behaviourists. And in the late 1950's psychology underwent another revolution – the "Cognitive Revolution". The revolutionaries were aiming to bring "mind" back into psychology and make *meaning* the central concept (Bruner, 1990).

Cognitivism/Computationalism

Watson's ideal of a psychology in terms merely of stimulus and response, habit formation etc., did not work out as intendent. Psychologists still needed essentially mental concepts like mental content; it did not help to decry them as mentalism (Kelly et al., 2007). Especially, Chomsky's critique was influential. The concern was that breaking down all behaviour into a chain of stimulus and response learning while postulating more complex behaviours as combinations of simpler behaviours, was at odds with the structure and order of human linguistic behaviour and cognition (Kelly et al., 2007). What was needed was a richer notion than the simple stimulus response mechanism (Kelly et al., 2007). Once again, the inner tension of psychology was the driving force propelling a new revolution. This time in the name of the *subjective,* psychologists were looking to crack open "the black box".

In "Acts of Meaning" Jerome Bruner (1990), who was directly involved in the cognitive revolution, gives an account of what the revolution was all about. It was an attempt to overcome the overly restrictive terminology and methodology of Behaviourism. In

Bruner's words: the "[…]revolution was intended to bring "mind" back into the human sciences after a long cold winter of objectivism" (p. 1). The conviction was that the concept of *meaning* was the key notion to capture what is essentially mental – and "not stimuli and responses, not overtly observable behavior, […]." (p. 2). As a consequence, the revolution aimed "[…] to discover and to describe formally the meanings that human beings created […], and then propose hypotheses about what meaning-making process were implicated." (p. 2). Therefore, it had to focus on human symbolic activities, which required psychology to collaborate with its closely related disciplines in the social sciences and humanities, such as anthropology, linguistics, philosophy, history, and so on. This marked the birth of the *cognitive sciences* (Thagard, 1996). However, Bruner laments that, too soon, the revolution became the victim of its own success.

The cognitive revolution fell back into objectivism once again, as it is necessary when naturalism operates as an unquestioned premise. Psychology's inner tension halted the initial impulse of the revolution. In order to comply with the naturalistic prejudice, the concept of meaning had to be understood naturalistically and thus lost its subjective character. In order to make theorizing about meaning and meaning making processes naturalistically tractable, a new model was introduced into the study of the mind – computation – which had gained ground earlier in the 50's within the cybernetics movement. Following the concept of a Turning machine, the mind could be modelled as a symbol manipulation mechanism, in which the symbols represent the actual world and the operations on the symbols (computations) enable constructions of mental models. According to the computer model, the brain is the hardware ("wet wear"), and the mind is the software run on this biological computer. The *Computational Theory of Mind* (CTM) appeased the naturalists. Afterall, a universal computer can be realized as a mechanism (Bruner, 1990; Kelly et al., 2007; Varela et al., 1991).

A digital computer employs mechanism (circuits) which can store and manipulate symbols. A computer uses physical states, e.g., flipflops (switches), which instantiate these

symbols (off=0, on=1) for the purpose of computation. Flipflops get their name, because they stay in one position when they are activated until they are reactivated again, hence they flip-flop between two states. The binary codes which can be made with these switches determines how many unique symbols the programmers have available; a meaning can be assigned to every combination of 1's and 0's. The hardware is manifested by switches (however physically realized e.g., mechanically or electrically), and the software is instantiated through the patterns these switches take[14]. By analogy, the brain is the hardware, and the mind is explained as pattern of the brain's states – the software.

The idea is not that there literally are tiny symbols[15] in the brain, but rather that the electro-chemical processes in the brain (most likely globally distributed brain states), instantiate a symbolical level (Varela et al., 1990, p. 41). Thus, the CTM introduced an irreducible symbolic level on top of the physical and the neuro-biological level. This level is physically realised, yet distinct from the physical. The symbolical level is the software running on the computer's hardware. Symbols are not the "objects" they stand for, but they refer to them. Thus, cognitive scientists argued they "represent" what they stand for. In virtue of standing for something symbols "have" meaning, in other words symbols enable a semantic level. The distinction between the physical, the symbolic level and the semantic level can be easily demonstrated by the fact that the same symbol can be instantiated in different hardware (multiple realizability) and the same symbol can have multiple meanings (Varela et al. 1990, p. 41).

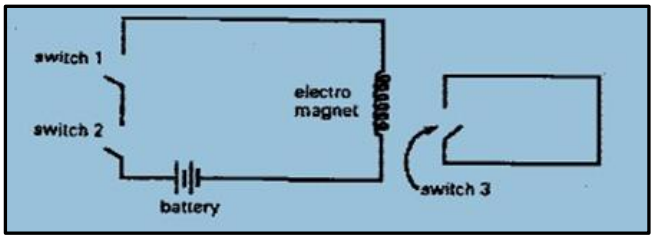
Armed with this model it was possible to open the overly restrictive "black box", which was how behaviourists choose to ignore the mind, because now mental mechanisms/algorithms could be postulated as hypothetical explanations for behaviours; and even non behavioural aspects of cognition (e.g., memory). These hypotheses could be tested by simulating the model in a computer and by specifying the model's parameters and testing

[14] the m-configurations, and the scanned symbols (Turing, 1936)
[15] Neither are there tiny symbols in a digital computer. Just switches.

if it will generate the desired behaviour. As a result, it was possible once again to tackle subjects such as mental imagery, thinking and even consciousness (Kelly et al., 2007). However, this came at a cost, because the physical states which are said to represent the real world "know" nothing of meaning, the naturalistic computer model switches the focus of the revolution from *meaning construction* to *information processing.*

The electro-mechanical processes "know" nothing about semantics, but they operate purely on the syntactic level. They are arranged into *logic gates*, of which the simplest example is an *and gate*. In an *and gate* (Figure1), two switches (1,2) are the input and one switch is the output (3). Only when both switches (1 *and* 2) are on does the electricity flow through the circuit and close switch 3 (see Block (1995) for how logic gates can be used for addition). Hence the physical system's computational function is implemented simply by following the mechanical arrangement according to the laws of physics. Although the arrangement models rational thought, because it guarantees the logical (syntactic) validity of the operations, the meanings we have assigned (or could assign) to the physical states of the switches are irrelevant to the computers functioning (Block, 1995). Whether for example 92 in binary (1011100) represents the letter "A", "B" or anything else is completely arbitrary and comes down to human convention in this case ASCII Code (assignment of binary to characters). What is important are only the bits and bytes being syntactically processed. For the computer, there is no *meaning*, there is only *information processing*.

Figure 1 Example of an "AND"-gate from (Block, 1995).



Nevertheless, the CTM was applied to the psyche, cognitivists arrived at the following view: the senses pick up non symbolic objective information from the "real world" and transfer it as symbolic input to the brain. Thereby the symbols represent the real world. Then the brain performs some computations to "process" the information, the outputs of these

computations are then transferred back to the body as motor commands which perform the behaviour that was computed by the brain. Therefore, CTM amounts to Locke's view of the mind as a "consciousness space" that is produced by the individual brains. Yet this space is seen as *epiphenomenal*. Nowhere in this process, does meaning have to enter the picture. All the *primitive processes* are purely syntactic (Block, 1995). Meaning is reduced to processing of "objective information" in the environment. Despite the lack of detailed mechanisms/algorithms for particular cognitive processes, it seems like in principle the mathematisation and therefore naturalisation of the mind has been achieved. Mechanisms in a computer are clearly within the scope of physics, thus symbols and meaning are now supposedly naturalistically tractable. And in time all the concrete mechanism are going to be inductively revealed, at least this was the conviction.

However, not only do we have a reappearance of the "consciousness space", we also have a reappearance of the dual aspect monism. Again, this monism only gives Descartes's dualism a new face. Even though the classical mind body problem in terms of how the two substances interact, is supposedly overcome with the computer model, the split reoccurs at meta level and amounts to what Thompson (2010), after Jackendoff, calls the *Mind-Mind problem*. Seemingly the dualism is collapsed into a material monism, where the hardware software distinction now makes clear how software itself is an arrangement of the one "substance" – the hardware. However, now that we have a computational mind that knows nothing about meaning and subjective experience, the question is: how this merely syntactic software mind – *the computational mind* – does give rise to our experiences – our *phenomenological mind*? The computational processing of information is supposedly happening at the sub personal level outside of subjective conscious awareness. Yet, if the theory takes account of all the relevant "objectively true" aspects of the mind (computation), there is no need for a personal level, a level at which meaning is experienced, at all. The experiences are degraded to *epiphenomena* with no causal efficacy. However, if the mind is

epiphenomenon, it is different in character from the physical it is an exception without causal efficacy. This brings back dualism through the backdoor.

Thus, the problem resurfaced in philosophy of mind as the "hard problem" of consciousness, introduced by David Chalmers (1995). Whereas, usually, naturalists reject dualism, because it assumes a metaphysical mind substance, Chalmers thinks naturalism through to its true consequences and names his position "*naturalistic dualism*". Chalmers realises that if every phenomenon has a mechanical explanation in the realm of physics this raises the "hard" question; why and how these objective phenomena ever give rise to consciousness? There is no mechanical answer possible (for essential reasons), thus he simply posits consciousness as a primitive (a sort of substance). One has, to applaud the integrity of at least realizing that naturalism amounts to a dualism. Yet, one has to reject the solution, as a merely a "rebranding" of substance dualism as naturalistically acceptable. With the hard problem troubling CTM, yet again the revolution arrived at a psychology which has no theoretical access to consciousness. This was what initially troubled Behaviourism. Even though the revolution was motivated by this problem, cognitivism simply inherited the ignorance of consciousness from the behaviourist paradigm. Therefore, sooner or later cognitivism had to come under pressure from the subjective side of psychology's inherent tension.

Enactivism

Even though, it seemed for a while, like the CTM was the "only game in town" (Fodor, 1975), because it was a mathematical (and thus a naturalistic) model of the mental. CTM came under internal pressure from developments within AI, namely through *connectivism* and *situated robotics*. Connectivism challenged the ecological validity of the computer model and introduced neural networks as a more biologically realistic alternative to rule based classical AI. The "*deep learning revolution"* (Veritasium, 2022) is ample evidence of the success of this approach, yet despite the shift from CPUs to GPUs neural networks still

run on classical computers. Moreover, neural networks are representational, just not via classical symbols but through the weights of their synapsis, thus "sub-symbolically". *Situated robotics*, however, challenged the dualism of representationalism altogether. Brooks (1990) claimed that dualistic representationalism is not necessary, but that the "world is its own best model". Why introduce a split between world and "its representation"? Lastly, Van Gelder (1995) suggested that the mind could be modelled as a *dynamical system* akin to the mechanical watt governor (see Ward et al. (2017), for a short summary of these developments). Enactivism, builds on these developments and puts forth a critique of *representationalism* and "objective information" through a focus on subjectivity ("*human experience")*.

The criticisms were effective enough to kick off yet another revolution – 4E cognition. However, the debate between Cognitivism and 4E cognition is still ongoing and forms the current battle ground in the philosophy of mind (Carney, 2020) 4 E cognition stands for *embodied*, *embedded-*, *enacted-* and *extended cognition* and refers to multiple more or less connected and overlapping theories of cognition, which challenge the classical computational and representational theory by focusing on the whole body and how it is situated instead of the brain-centric CTM. Because it purports to amount to a new paradigm (Stewart et al., 2010) and had a large impact on the subsequent development of the 4E cognition "movement" (Carney, 2020), we are going to focus on Enactivism (Varela et al. 1991) as the key representative. Moreover, Enactivism is directly relevant for us, because it responds to and uses phenomenology (especially in the form of Neurophenomenology; Varela, 1996, 1997; Thompson 2010).[16]

Enactivism goes back to the now classical book "The Embodied Mind" (Varela et al., 1991). Here Varela and colleagues problematize the lack of engagement with "*human*

[16]The other big strand of theory today is Predictive Processing, which has been omitted from the present account. If interested you can read about it here: Clark (2013) and Friston (2010). Afterall, Predictive Processing is also committed to naturalism and therefore suffers from the same problem.

experience" (consciousness), which we have attested to the CTM in the previous section. They argue that the cognitive sciences need a rigorous method for investigating human experience. They turn to Buddhist *mindfulness/awareness mediation* as a method to directly investigate experience, because they reject phenomenology. They argue, first person experience and third person scientific data can form a circular relationship of mutual enlightenment and constrains. According to Varela and colleagues, a Buddhist mindfulness/awareness investigation of human experiences leads to a rejection of the symbolic computational doctrine. Later, Thompson (2010) rejects the view, that mindfulness/awareness meditation reveals in experience what the enactive approach amounts to, as naïve, and with Varela's (1996) *Neurophenomenology* now embraces phenomenology. Not the least because they had a wrong reading of Husserl at first (see. Appendix A in Thompson, 2010). Despite this, nothing about the core enactivist doctrines changed, which is a hint that the theory was actually developed independent of "human experience". In reality it is grounded in *biology*.

The central idea goes back to Varela's work with Humberto Maturna (Maturana & Varela, 1987), namely the concept of *autopoiesis* (Maturana & Varela, 1980). *Autopoiesis* describes the self-production of living organisms, it's a name for the regeneration/maintenance of the same organization of their parts in the process of material and energetic exchange with the world. From this Enactivism developed the notions of *autonomy, adaptivity* and *sensemaking*. According to Di Paolo and Thompson (2014), an *autonomous system,* is a cognitive (*sensemaking*) system. It must fulfil two conditions, first, it needs to be operationally closed and second precarious.

Autopoietic systems, such as organisms, are producer and product of their very own processes which reproduce the same structure over and over again (despite the variations which occur from case to case). Such a recursive system in which the results of its processes are the processes themselves is called *operationally closed*. A cell for example is

operationally closed, it produces its own membrane through its metabolisms, yet the membrane is also a necessary condition for the metabolism to function properly. However, for this system to also *make sense* of the world it needs to be able to meaningfully *adapt* to the world. Thus, the second condition for autonomy *precariousness* is introduced. A system which is precarious is a system for which "existence" (the organisational structure which is reproduced in autopoiesis) is transient and dependent on enabling conditions outside of it, e.g in the environment. It will stop or run down if these conditions stop. Precarious processes are always decaying (Di Paolo & Thompson, 2014). What we usually call *life* are systems which fulfil this condition, they depend on e.g. water or nutrients etc. According to Di Paolo and Thompson due to an *autonomous* system's battle with its own finality – its precariousness – certain conditions in the world gain "normative status" (significance) for the organism.

If and autonomous system "actively copes with the world", engages in the battel, they call it *adaptive*. More precisely, *adaptivity* is defined as the ability to actively regulate the operationally closed processes in response to conditions in the environment or within the organism (the system), which are either viable or unviable for the organism's survival (the maintenance of its organisational structure). One could say that for an autopoietic system maintaining viable conditions amounts to homeostasis (Di Paolo, 2005). The fact that an organism activity regulates viable or unviable (good or bad) conditions for maintaining its autonomy (survival) enables what the enactivists call *sensemaking*; certain environmental features gain "significance" for the organism. The ability to *adapt* thus lets the organism gain a unique perspective on the world, which is relative to its own autopoietic organisation.

In the enactivist literature the classical example[17] is a bacterium swimming up the sucrose gradient via chemotaxis (watch this video to see the processes involved in chemotaxis https://youtu.be/LgPDOSou1tw; Ryan Abbott, 2017). The bacterium approaches sucrose rich

[17] There is a very good example in Varela et al. 1991, *bittori* (p. 88-92) for which there is no space in this paper

areas and avoids areas of low sucrose because its metabolism (the autopoietic organisation) determines that sucrose is a *nutrient* and that in the absence of sucrose essential enabling conditions for the maintenance of autonomy would stop. Only due to is specific operational closure, the bacterium picks up sucrose. Therefore, organisms *enact* and do not represent "meaning".

Enactivists reject information as a pre-specified feature in the world. Instead, they claim, it "emerges". They claim that through the interaction (structural coupling) of organism and environment, features of the environment take on meaning and thus hold "information" for the organism. The way the motions of the bacterium are coupled with the sucrose molecules and the medium makes it such that it *adapts* (regulates its activity) to approach sucrose rich areas. A cell which could not metabolise sucrose would not experience the same significance. Sucrose gets the normative status as "nutrient" because of the way it is coupled with the endogenous dynamics of the bacterium, and not because objective "food information" is "represented" locally somewhere in the cell. Thus, enactivisits claim information is not simply "out there" and then gets represented in the brain, where it is processed and stored and gives rise to a "consciousness space". It arises in the interaction of world and body. Enactivism entails that every cell is a cognitive system – this is called *the mind life continuity thesis*. The interactive "enactment" hypothesis is extrapolated to more complex systems such as humans.

In such organisms where there exists a nervous system, it is the way in which the nervous system links sensory and motor surfaces, to coordinate actions in the world, that is said to enact the "meaningful world". Including the human ability for language. Enactivism proposes that the mind is not in the head, but that cognition amounts to *embodied action*. *Enacted* is to be taken literally, that means cognition is something the whole body brings forth by acting (Varela, 1999). Varela argues that the mind requires the participation of the whole body actively handling/coping (with) the world. The body and the world are *sensory motor*

coupled, meaning the sensory stimulations and motor actions of the body are coupled with the world. Therefore, cognition is "[…]an *embedded* and active phenomenon" (Varela, 1999 p. 72), and "[…] whatever you call an object, a thing in the world, chairs, tables, people and faces and so on, is entirely dependent on this constant sensory motor handling. " (p. 72). In other words, the world which appears in cognition arises because of the activity of the body. Perception amounts to "perceptually guided"[18] action (Varela at al., 1991, p. 173). Therefore, you cannot see the world as independently existing "out there" and represented "inside the head" but mind and world arise co-dependently. They determine each other reflexively. Not everything can be reduced to the world. For example, the coupling with the world modifies the activity of the bacterium as one can see in the video, but how the bacterium is and can be modified depends on the structures of the bacterium and its proteins. Thus, enaction implies that the coupling modulates, but does not determine an ongoing endogenous activity. The world is a product of the mind (the body's sensory motor activity), which itself is a product of the world. They are co-emerging. The body determines its own boundary and thereby it also co-determines what is its environment. Yet, the body is a product of the environment. Therefore, Varela (1999) answers to the question "Where is the mind?": "[…] it is in this non-place of the co-determination of inner and outer, so one cannot say that it is outside or inside" (p. 73).

It is clear how the *emergence* of meaning counters representationalism, since the "representation" is not simply out there. However, this also counters objectivism. Even though Enactivism is a naturalistic theory (grounded in notions of biology) it *supposedly* does away with objectivism. Whereas I have argued that objectivism is an ingredient of naturalism. Due to the fact that body, world and cognition depend on each other – emerge co-dependently – enactivists deny an objectively existing world. Features (environmental regularities) of our everyday world e.g. colour are according to Enactivists not attributes of that world as such,

[18] Something about Varela et al.'s formulation already seems circular here *perception* its defined by "*perceptually* guided action*".*

but relative to the body of the organism. “Environmental regularities are the result of conjoint history, a congruence that unfolds from a long history of codetermination.” (Varela et al., 1991, p. 188-189). The history of structural coupling over the course of evolution specifies the environmental regularities (“world”) for the organism. Because world and cognition arise together as mutually dependent, enactivists think that they have cut through the dualism, which plagues cognitive representationalism.

However, once again, there is a sort of a dual aspect monism which whitewashes the dualistic problem. Here mind and world are two aspects of the body’s activity. The enactivists claim that this mutual specification allows them to sail safely through the “Scylla of Objectivism and the Charybdis of Idealism” (Varela et al., 1991, p. 172), by neither being objective nor subjective, but “enacted”. However, in reality this just covers up the real problem. Notice how the Scylla and Charybdis simply are the fundamental tension of Psychology. The unquestioned alliance to *naturalism* does not allow them to sail through the fundamental tension. But despite their denial, as naturalists they are necessarily committed to objectivism.

Enactivism distinguishes between *environment* and *world* (though Varela et al., (1991) unfortunately invert the proper use of these terms): the *environment* is conceived as the “objectively” existing milieu with which the organism is coupled (“the physical impacts it receives”; Weber & Varela, 2002, p. 117) and the *world* is the meaning which emerges through the coupling of the organism and environment (e.g. the in the case of the bacteria: environment = sucrose; world = nutrients). This raises problems. First, cognition is reduced to the interaction of the *environment* and the internal organisation of the body. Yet what is the body but an object in the “pre-given” environment? Second, what is the *environment* but what previously was considered to be the really existing world “itself”? Third, what is structural coupling but physical interaction of body and environment? Hence is embodiment not tacitly assuming objectivism as a starting point? Are not body and environment are assumed to exist

objectively. The environment "it-self" with the laws of physics grants that the organism receives "the physical impacts''. Epistemologically this raises the question how humans, who apparently live in the human "*world"*, are able to learn about the universal *environment*? Here is the untenable circular reasoning where the laws of physics, which rely on mathematical idealisations, are supposed to explain to us the activity of thinking. Hence, we already assume what thinking taught us (idealised "nature") as a premise in our explanation. Enactivists, despite their own claims to the contrary, assume the objective world (De Jesus 2018). However, afterwards this is covered up by saying that they did not really reduce thinking to the physical world, because the world is just co-dependently arising with cognition. Yet, they just shift the burden of proof from the "pregiven world" onto the "pregiven environment". This predicament could not be solved within the enactive framework. Varela might have felt the tensions and moved on to the advancement of the enactive approach into Neurophenomenology (closer to Husserl)[19].

The Prejudice of Naturalism

Despite the various differences in the approaches to psychology introduced in every "revolution", they all share a commitment to naturalism. Ultimately this splits the subjective from the objective and therefore introduced dualism, because the "objective nature" is an idealisation. In every paradigm the dualism gets a "new" face. However, in some way or another the natural world "nature" is always presupposed in every new revolution of psychology. The adherence to naïve experience (natural attitude) is unbroken since it seems "self-evident". Enactivism fully appreciates the *lifeworld* as the foundation of all scientific practice, however, the unquestioned naturalism remains active in the background. No, paradigm makes clear how the experience of the world the "nature" is constructed in subjectivity. The mathematisation is seen as unproblematic and mathematics as a neutral tool (even in Neuropehnomenology). Thus "nature" is taken as primary. At the end of the day each

[19]Unfortunately, we do not have space to discuss Neurophenomenology. Anyway, it remains naturalistic.

and every new psychological revolution remains anchored in the scientific method and continues to employ experiment and observation.

Unfortunately, Psychology cannot ground the *psychic* in the mathematical idealized nature. Even, mathematical and logical objects are constituted in subjectivity. Mathematics itself is fashioned in the *psychic* through acts of conscious life. A theory of psychology needs to explain mathematical evidence. It would be circular reasoning to presuppose it in its elucidation of psychology. Thus, idealized "nature" can clearly not serve as a premise in psychological theories when its validity itself depends on mathematical abstraction. This is to assume in the premises what is to be proven. Not, however, a true knowledge of the matter. Psychology thus needs to challenge naturalism. If psychologies history is instructive for its future, then as long as naturalism is not overcome psychology will shift its paradigm every 50 or so years. We can expect 4 E cognition to reach dominance soon and then be replaced about 50 years later by a new naturalistic paradigm. However, Husserl as a mathematician, began an investigation of logical evidence itself (in the Logical Investigations, Hua 18 & 19) (Hua 9/§3). This brought him to a new method; phenomenological analysis. It amounts to a new scientific discipline [*Wissenschaftlichkeit*]. This new scientific discipline contains a clue for an alternative method to psychology. I will lay it out in the next chapter as a potential avenue to go beyond the validity crisis.

Chapter 4: An Alternative: Phenomenological Psychology

One way to solve the replication crisis would be to abandon a psychology that proceeds like physics and consciously practice it as a τέχνη (technique). This would prevent the false overgeneralisations and make clear when larger statistical models need to be employed. However, Husserl offers an alternative, a truly mental psychology that can know the psychological as it is in-itself. Not a mere τέχνη. He proposes that his *phenomenological psychology* could provide an *a priori* for empirical psychology, like mathematics provides the *a priori* to physics. This would open a path to a truly theoretical psychology instead of a mere

enumeration of measurements as Debrouwere and Rosseel (2022) suggest. Through phenomenological reflection Husserl breaks with the naturalistic prejudice of the pregiven objective world and brings into view "the subjective as *self-enclosed pure context*" [*in sich geschlossenen und reinen Zusammenhang* (Hua 6/172)].

This Husserl calls the soil of a genuine psychology. He writes "I cannot do otherwise than deny that hitherto existing psychology has actually set foot on the soil of a genuine psychology." (Hua 6/253). According to Husserl we first need to develop a phenomenological psychology to make sense of the psychological content in the "doubtless very valuable facts" (Hua 6/253), which have been collected through the psychophysical *technique* (such as FMRI) and the psychology based on it. Only if we do have a psychology on its own genuine soil can we be clear what the related terms [*Beziehungsglieder*] (Hua 6/253) are in the empirical regularities between the psychic and the physical.

However, this method requires a break with the "self-evidence" of the natural attitude with the taken for granted pre-given world. But what could be more natural than a belief in the objects of the world? One just needs to bump one's head into a wall to realize the "givenness" of the objects. Thus, abandoning the natural attitude for an "unnatural" attitude, "places the greatest conceivable demands" (Hua 6/204) upon our philosophical rigor. What is needed is a reflection onto experience itself we need to begin to see e.g., our seeing as seeing and not just see objects. This means we have to pay attention to the *form* (*εἶδος*, *eidos*) of experience, because seeing, hearing, etc. are not geometrically idealizable bodies in the world that we can see, they are only traceable as the formal aspect of experiences. Husserl's *phenomenological reduction* is a focus on conscious experience itself. Following Husserl, this rigorous investigation of experience amounts to a new kind of scientific discipline [*Wissenschaftlichkeit*], "it is not mathematical, nor logical at all in the historical sense" (Hua 6/135). Thus, the reader must suspend his (probably naturalistic) prejudices about what is

science. I will now follow Husserl's explication until what he called the "soil of a genuine psychology" as a "pure self-enclosed context" will come into view.

The *pehnomenological reduction* has two moments, the *epoché* and the *reduction*. They are interdependent: whereas the *epoché* is the entrance gate, the reduction is entering into the investigation of what is given within the newly transformed attitude (Zahavi, 2003, p. 46). In other words, the former describes the leaving behind of the natural and naturalistic attitude of the sciences, whereas the latter describes the formulation of the new, phenomenological attitude, in which we can uncover the essential features of the subjective.

The first step is the *epoché*. It is the suspension of the natural attitude, in particular of the naïve belief in the mind independent existence of the "pregiven" world. Husserl describes it as a bracketing of the world. What he means by that is that we refrain from all validity [*Geltung*] we assign to the things in the natural attitude. We still have the same world before us but its within brackets. The {world} is there before us but we do not treat it as existing independently of our conscious experience of it. Therefore, all scientific facts and all the naively accepted objects, even the whole world itself, no longer count as valid. They remain unactual. Nevertheless, we are not completely abandoning the natural attitude "We keep the attitude (in order to be able to investigate it)", (Zahavi, 2003, p. 45), we just bracket its validity. All the things that interested us in the natural attitude, the world, the tasks and goals (including science) are still there as phenomena. Even objectivity is there, but as phenomenon. However, through the epoché we have become *fully "disinterested" spectators*. We have no worldly interests because we have suspended our belief in the validity of any interests and the validity of the objects they might concern. It is as if we give up the distinction whether our experiences are of real things or merely are a dream.

After the *epoché* brackets all existence, we must treat the experiences we have as appearances (phenomena), no longer as given facts. Hence, we must treat them as moments of

conscious life. It is in consciousness that the world (and the subject as part of the world) is constituted with its validity. However, it is important to note, that

> This is not a "view", an "interpretation" bestowed upon the world. Every view about . . . , every opinion about "the" world, has its ground in the pregiven world. It is from this very ground that I have freed myself through the epoche; I stand above the world, which has now become for me, in a quite peculiar sense, a phenomenon" (Hua 6/155).

Through the radical shift in attitude (the epoché) the world itself is *reduced* to a phenomenon constituted by subjectivity. This is the *phenomenological reduction*. However, as far as I the subject appear within the epoché, my existence, too, has to be bracketed. Therefore, in a "second" step the subject is also *reduced* to a phenomenon; this is the *transcendental reduction*. Husserl writes: "[…] through the epoche a new way of experiencing, of thinking, of theorizing, is opened to the philosopher; here, situated *above* his own natural being and *above* the natural world" (Hua 6/154-155). This is where the "new kind of" scientific discipline [*Wissenschaftlichkiet*] can begin. Through the radical (transcendental) epoché we have at once suspended the belief in all existence and positioned our self above it. Hence the psychological self-view where the world with the objects and the human body are pregiven and even the thinking of thoughts itself are overcome. Instead, the *reduction* engages in "a concrete exposition of what is given in sense-intuition purely as such" (Hua 6/159). Thus, in the reduction interests shifts from *what* appears to *how* it appears its *manners of givenness*.

In Husserl's words, we are bringing into view the whole "Heraclitan flow" of our sense-intuition [*sinnlicher Anschuung*]. As fully "disinterested" spectators we are no longer investigating "the world's being and being-such" (Hua 6/160) but "[…] whatever has been valid and continues to be valid for us as being and being-such in respect to how it is subjectively valid, how it looks, etc." (Hua 6/160). This means that we considered the *lifeworld* exactly in its relativity "according to all the manners of relativity *belonging essentially to it*" (Hua 6/158-159, emphasis added). We still consider the same realities, but

we consider them as they give themselves to us are given to us immediate experience. This includes even taking account of how things turn out to be illusions, even after first appearing as valid and all other purely subjective aspects of experience. For example, an object is never experienced all at once, but any particular view of an object will be perspectival and partial, e.g., we see one side only. This concrete exposition of actual experience, adumbration for adumbration rather than conceived of as already logically constructed "nature" is the phenomenological analysis. This is what it means to stand above the world, one truly takes experience as it presents itself, without adding any logically constructed objects (Hua 6/158 §44, §45).

The vantage point above the world allows the Philosopher to make "new" discoveries, in the sense of the "new" scientific discipline [*Wissenschaftlichkeit*]. Most importantly, "Given in and through this liberation is the discovery of the universal, absolutely self-enclosed and absolutely self-sufficient correlation between the world itself and world-consciousness." (Hua 6/154). On can now see, that, that which is experienced is phenomenon. It is an appearance for a subject in a mode of consciousness, the world is constituted in consciousness. Instead of looking for the particular things and what they are made from we are looking from "above" the world and the subject, at consciousness as such (including the immediate object of consciousness (noema) and the act of thinking it (noesis). Through the radical epoché, at once the *universal correlation* between the content and the consciousness of that content is revealed, as *self-enclosed* and *absolutely self-sufficient*. This *self-enclosed* and *pure* (absolutely self-sufficient), thus not dependent on anything that is not it) context is the true field of psychological research. Since it is *self-sufficient* is a true parallel to "nature". Whereas naturalism abstracts from all the subjective and arrives at the world of pure bodies, this cannot be achieved equally simple by simply abstracting from the bodies and thus retaining the soul. That would amount to the view of a "consciousness space" attached to each individual body and the souls would be given as apart, as history has shown. However, the

transcendental phenomenological reduction, reduced the individuals (including the psychologists) and reveals the psychic as one *self-enclosed* context in which all subjects are *transcendentally constituted*. Other "selves" are intentional objects like every other object after the epoché. At once the psychologist has before her only a field of meaning and meaning constructions.

In every conscious act an object (any object of thought) is displayed as an impression "of", a thought "of", a fear "of" and so on. This feature of consciousness had already been identified by Husserl's teacher Franz Brentano and he coined the term *intentionality* for it. This intentionality, the *thought of*, is essential to any conscious experience. Consciousness is always directed at something; it is *consciousness of* [20]. The epoché opens for us a gate into this self-enclosed "realm" of *intentionality*. If we *reduce* the world to *intentionalities*, then the world (everything experienced) is a total intentional accomplishment of a constituting subjectivity. Thus, "the world as it is for us becomes understandable as a structure of meaning [*Sinngebilde*] formed out of elementary intentionalities. "(Hua 6/171, brackets added). Importantly, Husserl stresses for the "elementary" intentionalities, that they themselves are " […]nothing but one meaning formation [*Sinnbildung*] operating together with another […]" (Hua 6/171 brackets added). Together they are "[…]constituting" new meaning through synthesis […]" (Hua 6/171). Thus, there is no elements that are not themselves meanings or elements which are simple and existing as such. Hence, according to Husserl, in the epoché we are always and everywhere dealing with meaning constituted by ego-subjects. If we see every experience always as meaning-formation [*Sinnbildung*], then we have uncovered the realm of the subjective. In Husserl's words the epoché allows us "[…]to see the purely subjective in its own self-enclosed pure context as intentionality and to recognize it as the function of forming ontic meaning [*Seinssinn*], […]" (Hua 6/172, brackets added). It is true that psychology is a science in the world and thus we have to return from the transcendental

[20] In case there is no object than the absence is the object.

reflection back to natural attitude – *phenomenological psychological reduction*. However, we are now aware that our mundane subjectivity is transcendentally constituted, the transcendental insight "flow in" to our psychological investigations (Hua 6/§59, §69, §71, §72).

The newly uncovered *self-enclosed pure context*, the "genuine soil of psychology", allows Husserl to investigate psychology on new terms, as an *a priori* science like mathematics is to physics. Above I showed how the universal *a priori* of geometry (and all of mathematics) provides the ability to make logical deductions (establishing necessary "lawful" relationships). Even though every new hypothesis has to be inductively tested in an experiment. Husserl claims that the *self-enclosed pure context*, the field of intentionality, provides a similar universality of essentially lawful insights "preceding" the empirical facts of psychology, like the mathematics "precedes" the factual observations of physics. This insights Husserl calls "the most important" for the development of a psychology as a rigorous science (Hua, 9/49). Form the new vantage point of investigation (the epoché) one is enabled to investigate the essential necessities for all *conceivable objects* (object here taken in the logical and not the physical sense, thus thinkable objects) and correlatively all conceivable subjectivities (consciousnesses).

Husserl proposes that the transcendental *constitution* of consciousness (transcendental accomplishment [Leistung]) can be grasped scientifically through an eidetic analysis. It amounts to an investigation not of the particulars but only of "the essential form of the transcendental accomplishments in all their types of individual and inter subjective accomplishments […]" (Hua 6/182). The psychologist seeks the (essential) structures without which "no conceivable human being, no matter how different we imagine him to be" (Hua 6/168) could accomplish this or that mental accomplishment at all. In free variation of possibilities (through imagination) the structurally necessary features without which, for example, a perception, would be unthinkable as a perception are brought into view (Hua

9/256-277). The structural invariants which cannot be varied away across the free play of the imagination make up the *eidetic (*form) essence of the intentional acts and their respective contents. Thus, psychology is a descriptive discipline, it describes species of mental acts and mental content. Meanings as meanings and how they are evolving. Always drawing on the evidence of direct experience within the reduction. Hereby we understand descriptive disciplines in an equally wide sense as for example geology or palaeontology, which through logical conclusions reaches into times far beyond the exact time of the collection of evidence.

However, this the new scientific discipline has to be qualified. Even though this psychology is an eidetic science like mathematics, it is unlike mathematics in an important respect. In the sense that it describes only the formalities under which every possible empirical fact must stand while abstracting from the given, it is like mathematics – *a priori*. Yet, Husserl avoids Wundt's mistake of assuming that one can do exact measurements in immediate experience. There simply is no analogue to the geometrically exact science after the *epoché*. The "Heraclitan flow" of experience is not exact in the sense that is required in mathematical physics. Husserl stresses:

> Not even the single philosopher by himself, within the *epoché*, can hold fast to anything in this elusively flowing life, repeat it with always the same content, and become so certain of its this-ness and its being-such that he could describe it, document it, so to speak (even for his own person alone), in definitive statements.
>
> (Hua 6/181)

Naturally, meanings are essentially vague, metaphoric, polysemous etc. Therefore, psychology which has only meaning and meaning constitution in front of it has no "nature". Husserl concludes:

> […], we can already say in advance, on the basis of insight, that the psychic, considered purely in terms of its own essence, has no [*physical*] nature, has no

> conceivable in-itself in the natural sense, no spatiotemporally causal, no idealizable and mathematizable in-itself, no laws after the fashion of natural laws. (Hua 6/225)

Therefore, practicing psychology as a natural science modelled after physics (*more geometrico*) is not an option. Moreover, we need to qualify: how to build from the a priori psychology a method of empirical psychology and how to search for the empirical laws? is according to Husserl an entirely new question (Hua 9/3f).

Nevertheless, with his method we can discover and clarify the *basics concepts* [*Grundbegriffe*] of Psychology – in essentially mental ways. This ofcourse is the answer to the conceptual work that was called for in the introduction. Husserl method is the clue [*Leitfatden*] for the discovery and clarification of the basic concepts. We cannot go into detail here and discover all the basic concepts. However, we have a contrast between a psychology with a *pure self encloses field of subjectivity* exposed to it and a psychology which is forced to operationalise all their concepts as an indirect way to access the mental "within" the "natural world".

Conclusion

After the transformation of straightforward living in the natural attitude with its naïve realism. What we take as "self-evident" in the natural attitude has been revealed to be constituted in consciousness as a "transcendental accomplishment". If we perform Husserl's reflection, we are given a "novel subject of investigation, […] the world purely and exclusively as – and in respect to how – it has meaning and ontic validity [*Seinsgeltung*], and continually attains these in new forms, in our conscious life." (Hua 6/151, brackets added). Now it is clear why Husserl denied that psychology even started to investigate its (true) subject matter. As long as it stays within the naturalistic nativity of the pregiven world there is no access to the *essentially subjective* as its own self-enclosed *pure context* [*Zusammenhang*].

In the absence of such reflections, however, psychology continuously operated naively on the ground of the "self-evidence" in the natural attitude. Husserl's, transcendental

investigations as an inquiry into the "ultimate source of all the formations of knowledge" Hua 6/101) led him to view the "taken-for-grantedness" of the naïve realist's world as "the enigma of all enigmas" (Hua6/208). Therefore, he concluded "It would be absurdly circular to want to deal with such problems on a naive, objective basis through the method of the objective sciences" (Hua 6/208). It is this absurd circularity, which makes all psychological "paradigms" from Introspectionism to Enactivism epistemologically untenable. In one way or another they all employ the "taken for granted" world uncritically, because they stick to *objectivism*. Yet "nature" is an idealisation psychology cannot rely on, because math and logic are mental accomplishments which need to be explained by a psychological theory and cannot be presupposed in its explanation.

In order to truly overcome the *objectivism* (as has been attempted both in the cognitive revolution and in Enactivism), what psychology needs is a method to capture the essentially mental as such [*das Eigenwesentliche einer Seele als solcher* (Hua 6/216)]. Husserl's method is for us a signpost toward the "the secure path of a science", as the method to do the conceptual work that was called for in the introduction. Unfortunately, we do not have the space to develop it here in all its concreteness. Moreover, what is needed is a critical engagement with Husserl himself, a critique of the critique. After Husserl came other phenomenologist such as Heidegger, Merlau Ponty or Varela and his colleagues (Roy et al., 1999) and disagreed with him. Psychology needs a general engagement with phenomenology. Enactivism paves the way for such an engagement, however, what is needed is more than an adoption of Enactivism but a clear investigation of the naturalistic prejudice even in Enactivism. A clear debate of what phenomenological psychology can deliver and where are its drawbacks in relation to the current state of the art. Adopting Galilei's method and its naturalism has led us astray and lead psychologists to vast over generalisation, could it be that we have to abandon naturalism all together? That is what psychologist have to get clear about.

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