

2 Action

Why do humans perceive the world spatially? A glimpse at the history of philosophy reveals various different explanations. For example, while Descartes thought that the properties of the retinal image are central, Kant referred to space as a condition *a priori* of intuition. Later on, Husserl claimed that spatial experience depends on the actions of the subject. In this part of my dissertation, I want to focus on approaches of the latter kind. Many accounts that spell out the basic idea that spatial perception is dependent on the actions of the subject have been proposed. However, since action is a multi-faceted phenomenon, the accounts vary widely in how they spell out the basic idea. Some rely on actual movements of the subject, some focus on the capability to act. Others propose that spatial experience is grounded in the knowledge about the sensory consequences of bodily actions.

I want to give an overview about the different accounts that share the claim that action partly constitutes spatial perception. The purpose of the overview is to inspire and to set in context the view that I want to argue for in the end. There are three chapters in this part. In Ch. 2.1, I will not only present some of the historical development that the main claim has taken since the middle of the 19th century. I will also answer the question of what it means to posit a constitutive dependence between action and perception in the first place.

The remaining two chapters of this part are devoted to giving a systematic grouping of different kinds of accounts. The accounts differ with regard to the way action is taken to be constitutive, ranging from actual movements to mere knowledge about the sensory consequences of possible movements. The result will be a comprehensive overview about how the constitutive dependence of spatial perception on action can be cashed out. Some accounts will be criticised and rejected. However, the final decision about which of the discussed accounts is most appropriate will be reached only in Part 3 where I

will present and discuss relevant empirical evidence to see which approach can explain the findings best.

In sum, this and the next part will bring us all the way to an answer to the question of whether and in what sense spatial perception is constitutively dependent on action. Given that we can assume this constitutive relationship, it will be possible, finally, to establish the claim that egocentric perception is a form of self-representation on a most secure basis.

2.1 Action as a constitutive condition on spatial representation: Introduction

This chapter serves two central aims. In the first section, I will present a rough overview about the history of the idea that spatial perception is dependent on action in one or another way. This will reveal substantial differences in how this claim can be defended. Before investigating the different kinds of approaches in a systematic manner in the following chapter, I will tackle the issue of what is meant by a ‘constitutive relationship’ in the second section of this chapter. Various notions of constitution are discussed in different fields of philosophy. I will go through some of them and ask whether they are applicable to the case of action and perception. I will conclude that we should adopt the approach that Tyler Burge (2010) takes on this matter, arguing that constitutive conditions are those conditions that determine the nature of something. Given this understanding, the claim that action is a constitutive condition on spatial perception amounts to nothing less than arguing that action is essential for spatial perception, that action is part of the nature of spatial perception. I think that this understanding of what is argued for in the accounts that I will discuss is most appropriate.

2.1.1 Action as a constitutive condition on spatial perception: Brief historical overview

The basic idea that spatial perception constitutively depends on action has quite a long and multifaceted history in philosophy and psychology. Many thinkers and schools have proposed it in the past. In this section, I will give a rough historical overview of the most prominent and important accounts that proposes such a relation. Of course, I cannot review or even mention here any account that argues in favour of action as a constitutive condition on perception. Hence, I present those accounts from roughly the last 150 years that I take to be most elaborate and/or influential on subsequent discussions.

The basic idea that perception of space cannot be explained by bare visual or tactile sensations came up at least in the middle of the 19th century. Alexander Bain (1855) was one of the first who proposed that a sense of movement was necessary for the perception of space.³¹ Partly through the work of Carl Stumpf, Edmund Husserl got to know about Bain's approach.³² Husserl's own stance on the question of how the spatiality of perception is to be explained always circled around this basic idea, esp. around the concept of *kinaesthesia*³³. However, his interpretation of this notion changed fundamentally during his life. In his earlier works he took the concept literally and accordingly thought that sensations of movement are partly constitutive of spatial perception.³⁴ Later on, he revised his understanding to the effect that

31 His theory was criticized by a student of Brentano and Lotze (whose own students Wertheimer, Köhler and Koffka later became founders of the Gestalttheorie), the German philosopher and psychologist Carl Stumpf in Stumpf (1873), pp. 36–71.

32 Husserl read and made extensive notes on Stumpf (1873). He also possessed some later works of Bain; cf. Ferencz-Flatz (2014), p. 23.

33 The term '*kinaesthesia*' literally means sensation of movement. It goes back to the Greek terms *kinesis* and *aisthesis*, which mean movement and sensation, respectively. It was introduced not before the beginning of the 19th century.

34 In this time he discussed the questions as part of a Philosophy of Mathematics, namely as part of a philosophical account on geometry. This perspective on the problem is similar to the one of the mathematician Henri Poincaré who also expressed a tight relation between action and space in his writings, although without going into any detail. E.g., "It is

movement itself served the constitutive function. However, even this was not his final position. In his last writings and notes on this topic, *kinaesthesia* became more and more a synonym for the practical possibilities of the organism to move itself (see also Ch. 2.2.2.2 and 2.3.1).³⁵ Other prominent representatives of Phenomenology defended this view, especially in versions akin to the last Husserlian view. Heidegger thought that perceptual space is fundamentally structured by *care* (Sorge), which he took as a fundamental constituent of the way of being of humans, namely their mode of being as being-in-the-world (In-der-Welt-sein).

But Dasein is “in” the world in the sense of a familiar and heedful dealing with the beings encountered within the world. Thus when spatiality is attributed to it in some way, this is possible only on the basis of this being-in. But the spatiality of being-in shows the character of *de-distancing* and *directionality*. (Heidegger 2010, p. 102)³⁶

A contemporary of Heidegger's who is not much discussed these days also defended this kind of view. Max Scheler claimed that the grasped potentiality to move oneself constitutes perceptual space (Scheler 1928, esp. Part III; Scheler 1960, Part V). For him, drives and the dispositions to move they

this multiplicity of parries, and the resulting co-ordination, that is space” (Poincaré 2010, p. 104).

- 35 The first thoughts on space and spatial perception of his are developed in the 80's and 90's of the 19th century, when he planned to write a book on space that never was finished. These are published in Husserl (1983). The next important stage in his thinking about these issues is represented in his lectures from 1907 on “Thing and Space” (Husserl 1991). In his late writings, like Husserl (1954), questions about the constitution of space are treated, too (cf. about this last work Neumann 1999, pp. 132–8). However, beyond this, there are many notes on the problem of constitution of space, several of which have not been published yet. Some can be found in Husserl (2008b), a larger piece in Husserl (1940b) and Husserl (1940a). See also the many references that are made in Claesges (1964), where almost only thoughts that are hidden in the manuscripts (some of which are not published yet) are explicated.
- 36 “Das Dasein aber ist »in« der Welt im Sinne des besorgend-vertrauten Umgangs mit dem innerweltlich begegnenden Seienden. Wenn ihm sonach in irgendeiner Weise Räumlichkeit zukommt, dann ist das nur möglich auf dem Grunde dieses In-Seins. Dessen Räumlichkeit aber zeigt die Charaktere der Ent-fernung und Ausrichtung” (Heidegger 1972, pp. 104–5); cf. §§23–4 and Heidegger (1979), §§23–25, esp. §25.

ground are the decisive constituents of perceptual space (see also Ch. 2.6.2). Scheler, Heidegger and Husserl all emphasized in one or the other way the role of the practical engagement with the environment, the (dispositions to) bodily movements this leads to, the (potential) movements of the body. Other phenomenologists, like Maurice Merleau-Ponty, tried to express the same thoughts by investigating the structure and phenomenology of the Leib, which they took as a system of practical abilities and distinguished it sharply from a mere (physical) body (Merleau-Ponty 1974; see also Ch. 2.2.4.2).³⁷ In these conceptions, perceptual space is constituted by the mode of human existence as being an embodied existence. We find thoughts in this vein also in the current literature on embodiment, perhaps most prominently in the writings of Shaun Gallagher (2005; 2003). In his account, the physical structure of the body is most important while the practical dimension of embodied existence seems to be more in the background as is the difference between Leib and body (see also Ch. 2.2.4).

The development of the basic idea that started rather in the field of psychology than philosophy (although there was no sharp distinction between the fields then yet) was further developed in psychology as well. A cornerstone in this development is the work of Jakob von Uexküll, a prominent representative of ecology, who introduced the concept of ‘Umwelt’ (Uexküll and Kriszat 1956; Uexküll 1973).³⁸ His conviction was that the structure and possible contents of perception depend on the way of existence, the needs and practical possibilities the organism has. Thus, every kind of organism inhabits and perceives its own special Umwelt, its own ecological niche, as it were. This idea of species-specific ways of being and perceiving is also a key point in the theory of another important psychologist, James J. Gibson (1950; 1979). Gibson did not only propose that animals perceive affordances,³⁹ but he also claimed that perception depends fundamentally on the movements of

37 A similar conception is presented in Kruse (1974).

38 Central to ecology as a scientific discipline is the investigation of the relationships of organic systems with their environment, including mutual relationships of organic systems.

39 Gibson was not the first to use this concept. For example, Lewin (1982), p. 99 uses the term “Aufforderungscharakter” (this work was first published in 1933).

the organism, be it eye- or bodily movements (see Ch. 2.2.2.2). It was Gibson's ecological approach that was received by analytic philosophers such as Gareth Evans, whereby the basic thought that perception fundamentally depends on the activity of the organism found its way into analytic philosophy (Evans 1982; 1985).⁴⁰ Evans proposed that perceptual space depends on complex connections between sensory input and behavioural output (see Ch. 2.3.3).⁴¹ Since this major figure of analytic philosophy, many philosophers have formulated similar views. A recent key account I want to mention here is Susan Hurley's. It presents another pronounced explication of the basic thesis in the Evansian tradition that is based on the distinction between instrumental and non-instrumental relations between action and perception (Hurley 1998; Hurley 2001; see Ch. 2.2.2).⁴² Another major recent account in the field is the "enactive view" as elaborated by Alva Noë (2004). In this account, the explanation is mainly driven by sensorimotor knowledge, a kind of practical knowledge that the subject needs to possess and make use of to be able to perceive (see Ch. 2.2.3).

40 That Evans was familiar with the work of Gibson is shown by his explicit reference in Evans (1982), p. 122, n. 4. Evans also refers to Taylor (1978), an essay that explicates ideas of Merleau-Ponty's, and to Pitcher (1971).

41 Thus, he claims that "an egocentric space can exist only for an animal in which a complex network of connections exists between perceptual input and behavioural output." (Evans 1982, p. 154)

42 Other recent works that are worth mentioning here are Baldwin (1995; 2003), Malpas (1999), Grush (2000; 2007) and Schellenberg (2007).

Figure 2 is a chart of the different accounts that is sorted with regard to which aspect of action is taken to be crucial in constituting perceptual space. This rough overview, in which of course only the most important representatives of the basic idea are mentioned, shall show the great variety of thinkers, schools and accounts that express the thought that perception is fundamentally dependent on some activity on the side of the perceiver. In the next chapter, I will systematically contrast these different approaches according to their understanding of the central notions. First, however, it is necessary to take a closer look at the very idea of constitutive dependence: what it means and how it contrasts with related notions. This will be the task for the following section.

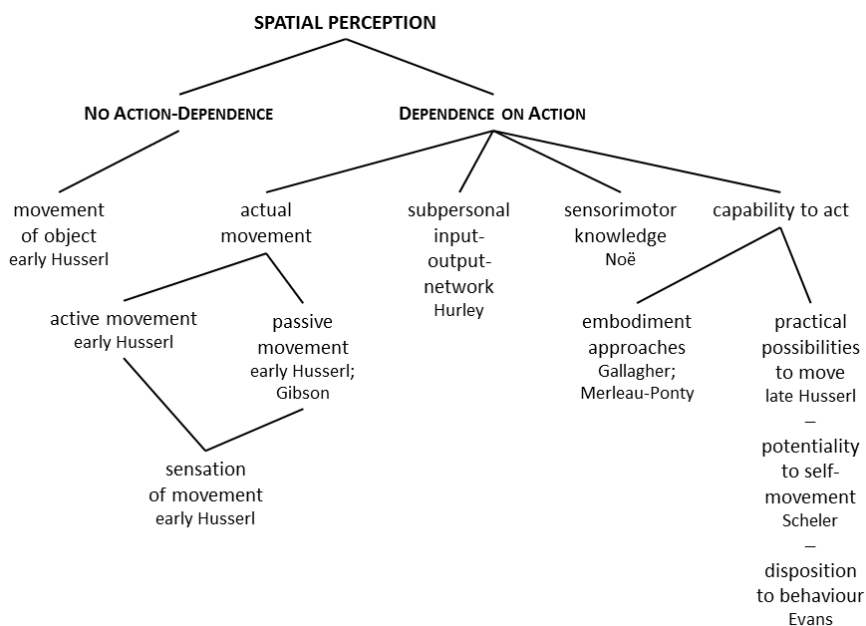


Figure 2: Overview of the different kinds of accounts that are discussed in the text.

2.1.2 The notion of ‘constitutive condition’

Although there are a plethora of accounts that defend a constitutive relationship between action and perception, it is seldom explicated what such a relationship really means, which is quite surprising. After all, if one posits a special relation between two things one should be clear on what this relation amounts to and how it is to be conceived of. The following is not meant to be an exhaustive explication of the notion of constitutive condition. However, I want to get some grasp of the notion of constitution before evaluating accounts that claim that action is a constitutive condition on spatial perception.

I will proceed as follows. I will first shortly present different notions of constitution that do not seem applicable to the case of action and perception, although they include features that are also important for this case. These will be conceptions of constitution as a building relation, a conceptual relation, and as being distinct from causation, respectively. Neither seems to fit the case entirely. Therefore, I will concentrate on two accounts of constitutive explanation that are best applicable to the case of spatial perception and action. These will be the accounts of John McDowell, and Tyler Burge, respectively. I will argue that Burge’s account is most convincing and I will show that his account incorporates features of all other discussed notions of constitution.

2.1.2.1 The various notions of ‘constitution’

Constitution has been analysed as a kind of building relation (Bennett 2011), as a conceptual relation (Clark 1989), or by contrasting it with the notion of causation (Ylikoski 2013). Let me have a short look at each in turn. Although all three are not applicable *simpliciter* to the case of action and perception, they include features that help to understand the concept of constitution.

Karen Bennett (2011) analyses the relation of constitution as a “building relation”. According to her, “a relation is a building relation iff it is asymmetric and irreflexive, and the ‘input’ relatum(a) is both more fundamental than the ‘output’, and in some sense overlaps it” (p. 92). This notion is best applicable to material objects, like a lump of clay constituting a statue. The first two properties (asymmetry and irreflexivity) indicate that the relation is a *directed*

relation between two distinct entities. If x builds up y , then y does not build up x (asymmetry). In addition, x is not built up by itself (irreflexivity). The third property, (relative) fundamentality, indicates that the built entity is in some sense at a higher level than the building entity. Finally, the notion of overlap is necessary to mark that there is some connection between both entities.

I think this notion is not applicable to the case of action and perception. It is not clear why we should take the relation between action and perception as asymmetric. It seems possible that action will be constitutive of perception while perception is constitutive of action as well. It would be odd to rule out this possibility from the outset on *a priori* reasons. For the same reason, it is not clear why one should think of action being more fundamental than spatial perception. I think the only feature from Bennett's account that is important for the case of action and perception is the one that she tries to capture with her notion of overlap. I think this last property of Bennett's is meant to pinpoint to the notion of relevance: when some phenomenon is explained by appealing to another, the latter should be relevant for the former. However, there is a basic problem with her way of cashing out the notion: she seems to confuse the level of explanation and the level of things in the world. The mere fact that two things overlap does not tell whether one is relevant for explaining the other. This confusion of levels seems to be the reason why she ends up with a very unsatisfying idea of 'overlap' taken as a primitive notion that cannot be further explicated (pp. 91–2). I will come back to the topic of relevance below.

The second notion of constitution takes it as a conceptual relation. Clark (1989) argues, "fact p is constitutively relevant to q if on conceptual grounds we can see that q could not survive the subtraction of p " (p. 55, quoted from Colombo 2013, p. 556). On a strong reading, this quote implies that constitutive conditions are revealed by armchair reasoning alone. However, it is dubious why one should confine oneself to this sort of reasoning in investigating the constitutive conditions of spatial perception. I do not think that this is the right way to go. To the contrary, I think that empirical findings seem to be

highly relevant for deciding this question (cf. Burge 2010; Merleau-Ponty 2002) and I will present a lot of relevant material in Part 3 of this dissertation.

In addition, the quote from Clark suggests that action is not more than a necessary condition on spatial perception. However, intuitively, a constitutive claim implies more than that. Otherwise, even the presence of oxygen would count as constitutive since without that, spatial perception is not possible. We want to say more than that action is necessary for spatial perception. The question is what this “more” may consist in.

In delineating the notion of constitution from the notion of causation, Petri Ylikoski (2013) considers more features of constitutive relationships. His characterization of a constitutive relation is as follows: “System *S* has causal capacity *k* in circumstances *T*, due to *S*’s components $s_1, \dots, s_n$ and their organization *O*” (p. 281).⁴³ Put more informally, explaining what constitutes some capacity of a given system means to elucidate components of the system along with their organization. The crucial distinction to a causal relation is that the relation of constitution does not hold between two events but between what he terms “causal capacities”, which he takes to include all sorts of dispositional notions like ability, power, disposition etc. (p. 279). However, this way of spelling out the idea seems to be quite similar to Bennett’s building relation – something Ylikoski himself mentions (p. 283). After all, the explanatory work is done by parts of the organism, their properties and organization.⁴⁴ Hence, unless one takes it natural to speak of action as a part of the organism, Ylikoski’s notion does not seem applicable to the case of action and perception. This notion of constitution does not accommodate the case of one capacity constituting another one, a relation where it does not make much sense to speak of a part-whole relationship.

43 This formulation is not only similar to Bennett’s ‘building relation’ stated above but also to the idea of a ‘property theory’ put forward by Cummins (1984), p. 14–22, condensed in the statement: “Successful analysis yields an explanatory payoff when we come to see that something having the kinds of components specified, organized in the way specified, is bound to have the target property” (p. 17); cf. Cummins (2000), esp. pp. 122–4.

44 The important bit of the characterization is the expression ‘due to’. One might argue that it hides more than it explains.

This quick survey of different concepts of constitution does not only reveal that there are great differences in what is taken to be distinctive of the relation of constitution. Furthermore, it shows that the notion is not primarily developed to explain the case of two capacities constituting each other. Hence, these rather general approaches to constitution, although they point to important features like necessity or relevance, which will appear again below, are not of much use for my discussion.

In the following sections, I will discuss two accounts that better fit my case. I will finally argue that Burge's view is best for understanding what it means that action is a constitutive condition on spatial perception.

2.1.2.2 McDowell: Constitutive conditions and enabling conditions

John McDowell develops a distinction between constitutive conditions and enabling conditions on the basis of a critical discussion of Daniel Dennett's "cognitive theory of consciousness" (McDowell 1994; Dennett 1978). The central question of the debate is how the contents of conscious perception are to be explained. On Dennett's view, those portions of subpersonal level information becomes conscious that may be articulated verbally.⁴⁵ Thus, the content of visual experience consists in what is processed from the retina through the various parts of the visual system to that part of the brain where linguistic output is processed.

McDowell, in contrast, argues that studying the sub-personal mechanisms that underlie the processing of visual information cannot help us understand what perception is. These causal processes present merely *enabling conditions* for the organism to get in touch with its environment. However, they cannot be part of the conditions that are constitutive of perception. One can see the divergent opinions by Dennett and McDowell clearly by regarding the different interpretations of the following statement: 'It is in virtue of the subpersonal information-processing machinery that transmits its results to a certain

45 This is at least McDowell's interpretation. I am not concerned here with the question whether McDowell's reproduction of Dennett's ideas is entirely correct. I just take this discussion as the background against which McDowell's distinction of enabling vs. constitutive conditions shall become obvious.

part thereof that the organism can be said to perceive its environment.’ While Dennett would read this claim, in particular the “in virtue of” phrase, constitutively, McDowell would read it as expressing an enabling condition.

Unfortunately, McDowell does not provide any clear positive view about what constitutive conditions would amount to. It seems that at least three contrasts are in play here, which shall illuminate what constitutive conditions are.

The first contrast is between constitutive and causal conditions. I already elaborated on this in the last section. McDowell argues against Dennett that just alluding to causal mechanisms cannot provide a constitutive explanation.

The second important contrast that is in play in his considerations is between the personal and sub-personal level of explanation. McDowell’s discussion might be understood as arguing in general against the project of explaining personal level phenomena by sub-personal level mechanisms. It seems that sub-personal mechanisms are the wrong entities to draw on in explaining personal-level phenomena constitutively (although they might be necessary as enabling conditions). This might be because these mechanisms are causal relations (cf. first contrast). Alternatively, it might be because these mechanisms are mechanisms of just parts of an organism: when describing sub-personal processes one is not concerned with the organism as such but only with some parts of it. Since perception is a capacity of the whole organism, an exclusive reliance on sub-personal level mechanisms might, *in principle*, be insufficient to account for the personal-level property.⁴⁶

Third, it seems to me that the leading contrast McDowell has in mind is the one between ‘What?’-questions and ‘How?’-questions. For the case of perception this means that the question ‘What is perception?’ (Answer: constitutive conditions) has to be distinguished from the question ‘How is perception realized?’ (Answer: enabling conditions). The latter can be answered by citing causal processes and the like based on investigations carried out in the sciences. However, these cannot, in principle, answer the (philosophically more important) ‘What?’-question on his view.

46 If this were McDowell’s rationale, it would seem very weak: we often explain certain capacities of things by alluding to parts and processes within the examined object.

However, again it remains unclear what form an answer to that question might take. The only hint is his interpretation of perception as openness toward the world, meaning that perception allows organisms to get “in touch” (p. 201) with their surroundings. This answer differs from the answer to the ‘How?’-question in various aspects: it concerns the organism as a whole, including its way of living (in the ecological sense), instead of just some mechanisms within its systems; and the answer is based on rather general considerations, which are at best “remotely empirical”.

These points show that McDowell does not provide any clear positive characterisation of constitutive conditions. Various aspects in his discussion seem to point to some distinctive properties of constitutive conditions. However, since one has to figure these out *ex negativo*, it is hard to get a grip on his positive views. Hence, I think that all we can take from him is that constitutive conditions answer certain ‘What?’-questions and that they include more than just causal mechanisms.

2.1.2.3 Burge: Constitution and essence

A better articulated account of the notion of constitutive explanation is developed by Tyler Burge (2010, esp. pp. xiii–xvi; pp. 3–6; pp. 57–9; pp. 532–4). There are two crucial aspects about his analysis of constitutive conditions. The first is that they include necessary and/or sufficient conditions. The second is that what is thereby explained is something’s nature, or what something is.

Constitutive explanations feature those conditions that cannot be changed without a change in the phenomenon to be explained. Condensed in a statement:

A constitutive question concerns necessary (or sufficient, or necessary and sufficient) conditions under which something is what it is. Such a question concerns conditions under which something has the nature that it has. (Burge 2010, p. 57)

Giving an answer to a constitutive question is thus to spell out what is essential about some phenomenon, meaning the conditions that cannot be changed without any direct effect on the explained phenomenon.

Although I did not spell out the idea of constitutive conditions in terms of conditions for something's nature yet, it turns out that Burge's considerations about constitutive conditions link to almost all aspects I discussed in this section before. He thinks that questions about constitutive conditions are in a way conceptual questions but he makes clear that answers to these questions are approached neither by concept analysis alone nor without any empirical warrant (p. 5). This means that in the endeavour to understand the constitutive conditions for a given phenomenon we seldom if ever merely analyse the concept that applies. We take into account general empirical observations and scientific findings.

He also claims that the conditions that are part of constitutive explanations need not be part of the phenomenon explained (p. 58). There is thus not necessarily some part-whole relation between the constituting and the constituted. This speaks against the notion of constitution as some kind of building relation in the above-discussed senses.

In addition, he spells out his idea of the constitutive question by way of contrasting 'What?'-questions and 'How?'-questions (p. 533). Constitutive questions are regarded as 'What?'-questions. This is a direct parallel to McDowell, who claims that only constitutive explanations can tell what something is as opposed to merely telling how something is possible, which can be done by citing enabling conditions (see above).

However, how can Burge's analysis be applied to the case of action and perception? Taken literally, the claim that action is a constitutive condition on perception would then mean that action is necessary or sufficient or necessary and sufficient for perception. Which is the right option in this case?

It cannot be sufficiency. No one is able to perceive merely because he is able to act. There surely have to be some means of receiving and processing external input, like receptors and transducers of externally caused information, with which the subject picks up something from the environment. Thus, perception has some passive component. So what should we then think of the constitutive claim? We saw that it is neither enough to conceive of constitutive conditions as merely necessary (as in the exclusively conceptual reading above) nor to conceive of them as merely sufficient.

The claim that action is a constitutive condition on perception can only be intelligible if it is regarded as follows: action is one of the necessary conditions that is, together with other necessary conditions, sufficient for spatial perception. Neither is it alone necessary nor sufficient, nor necessary and sufficient, but only together with other conditions.

However, even this characterization is not enough. This leads us to a further aspect that is emphasized by Burge, namely the question of relevance.⁴⁷ The question is whether action is on a par with such necessary conditions for perception as the fact that oxygen is around. We can distinguish here between background necessary conditions and relevant necessary conditions. For this distinction there seem to be no general rules for how it is to be drawn. It depends on the explanatory project: the explanatory target determines which conditions are mere background and which are relevant (pp. 58–9). If one wants to explain the capacity of perception of humans, there are a number of necessary conditions that are implied simply by the fact that what we want to explain is a *human* capacity. All conditions that are necessary for the possibility of living humans are *ipso facto* background conditions for the possibility of human perception. In addition, we would count as background conditions those that make up the ‘normal circumstances’, i.e. the ‘physical setting’ in which we ordinarily perceive. However, this is not a general rule: a scientist might be interested in the question of how the physical and chemical composition of the human body and its surroundings have to look like for the possibility to perceive, e.g. what makes reflection, transmission and reception of light possible. In that enterprise, what we would regard as background conditions would figure as relevant conditions (cf. the notion of a proportionality between causes and effects in causal explanations proposed by Yablo 1992).

In sum, the relevance of certain facts always pertains to the particular explanation that one is after. For explaining spatial perception, this implies that all conditions that are necessary to make human life possible, the basic laws of nature etc. are taken as (possibly necessary) background conditions. The

47 This is the feature that Bennett tries to capture with her notion of overlapping, as I explained above.

question is whether action is a relevant necessary condition on perception that, together with other relevant conditions, like the presence of an input processing machinery, is sufficient for the capacity of human perception.

We can even be slightly more specific. Since the *explanandum* in our case is *spatial* perception, action is supposed to be a constitutive condition merely on the spatiality of perception. Action might not be necessary for perception but only for *spatial* perception. This allows us to regard other necessary conditions for perception as mere background conditions and ask whether explaining spatial perception necessarily has to take into account the action of the subject.

2.1.3 Summing up

I think the discussion of the different concepts of constitution has shown that Burge's account of constitutive explanation best fits the case of action and perception. One might put what is at stake here by saying that the basic claim to be considered is that action is an essential feature of spatial perception. The various accounts I have already presented above in the short historical survey and that I will present in the next chapter specify the details of this relationship between action and perception in different ways. They share the commitment to the idea that there is such a dependence of spatial perception on action.

To sum up, what do we mean by the claim that action is a constitutive condition on spatial perception? We do mean that spatial perception is only possible for organisms that are capable of acting. In addition, we do mean that this capability for action together with other conditions that are necessary for the possibility of perception forms the ability of spatial perception of the organism. Thus, the claim is that action is part of the nature of spatial perception.

In the next two chapters, I will investigate different kinds of accounts that claim such a constitutive dependence of spatial perception on action. In the course of doing so, I will take into account almost all of the approaches that I mentioned in the historical overview. It will be obvious that there are quite distinct ways of spelling out the basic idea of a constitutive connection between action and spatial perception. Some accounts will be ruled out during

the discussion already. Others will be kept until Part 3 and then evaluated against empirical evidence. What will emerge in the upcoming chapters is a comprehensive picture about the ways in which a constitutive dependence of spatial perception on action has been argued for and an evaluation of the appropriateness of the accounts. This will provide the basis for a justified decision about how to spell out the constitutive dependence, which in turn will finally ground the argument that egocentric representation is a kind of self-representation.

2.2 Systematic overview of constitutive accounts I: Hurley, Noë, Embodiment approaches

2.2.1 Introduction

In Ch. 2.1, I argued that the relevant notion of constitutive explanation for the case of action and perception alludes to the concepts of nature and essence. Claiming that spatial perception constitutively depends on action means to conceive of action as partly constitutive of spatial perception. In addition, as I also made clear in the preceding chapter, this basic idea has been cashed out in a variety of ways over the last about 150 years. In the following two chapters, I will develop a systematic overview of the different ways a constitutive dependence of spatial perception on action has been defended. The main distinguishing element among the accounts will be the way in which action figures in these approaches: the alternatives range from actual movements to mere action possibilities, from sub-personal level output states to knowledge about the sensory consequences of actions. Please refer back to Figure 2 (p. 67) to get a quick overview of the possibilities.

I will begin the discussion with a rather recent account given by Susan Hurley. The central contrast that figures in her approach is between constitutive and instrumental dependence of perception on action. Based on this distinction, it is possible to rule out certain accounts as merely claiming an instrumental dependence of perception on action. In particular, I will argue that all accounts that centre on actual movements effectively propose only an instrumental dependence of spatial perception on action. I will discuss two such accounts, in particular Gibson's ecological view and the account of the early Husserl. Thus, the left-sided accounts presented in Figure 2 are ruled out.

The remaining accounts that will figure in the discussion are the following:

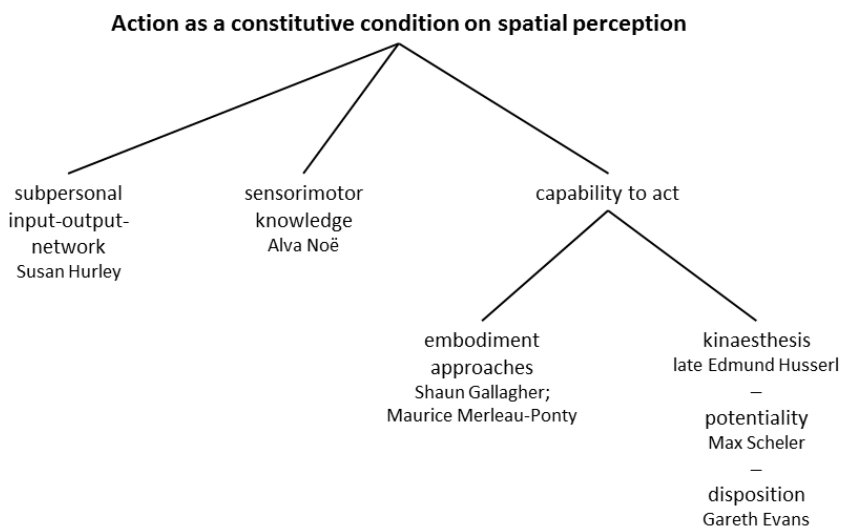


Figure 3: Remaining discussed constitutive accounts.

The chart shows that the remaining alternatives can be grouped into three main approaches. On the left, there is the approach developed by Susan Hurley that draws heavily on claims about the interconnections between input and output mechanisms. This approach contrasts with the others in that it

draws on sub-personal level explanations and in that it is concerned with particular episodes of perception instead of the ability of spatial perception (see Ch. 2.2.2).

The second kind of approach is represented by the enactive account as put forward by Alva Noë. On his view, it is our basic knowledge about sensorimotor contingencies on which spatial perception depends constitutively. The account features in this overview since the relevant knowledge is taken to be practical knowledge of the effects of movement on sensation. A review of the position will elicit certain ambiguities related to the exact role that knowledge plays here. Thus, it is not entirely clear, and textual evidence is ambiguous on this point, whether spatial perception is an *exercise* of the practical knowledge or whether perception *depends* somehow on this knowledge. I will look at this ambiguity in detail in the respective section (see Ch. 2.2.3).

On the right side, there are several accounts that draw on the idea that the capability to act is crucial. I further divided this kind of approach into two sub-kinds, depending on the importance that is attributed to the body by the approaches. The accounts of Gallagher and Merleau-Ponty are developed in terms of preconscious interactions between body and world. However, it is difficult to figure out what really does the explaining there: mere physiology, body image or body schemas (see Ch. 2.2.4).

In Ch. 2.3, I will go on to discuss the accounts on the right side of the chart in Figure 3. These cash out the notion of capability to act in ways that are neutral with respect to embodiment (although they might be compatible with such approaches). Each of the approaches slightly differs in the way the capability to act is taken to be a constitutive condition of spatial perception. I will only briefly present the later Husserlian view, since his later thoughts on the issue are not systematically developed and difficult to interpret. I will mainly concentrate on the views of Scheler and Evans.

Overall, what emerges in the following two chapters is a comprehensive view about ways in which the basic idea of action as a constitutive condition on spatial perception may be developed. Each of the accounts centres on a different feature of action. Although there are some rather great differences

among the approaches, it might not be impossible to integrate some of the accounts into another more comprehensive one. Hurley's two-level interdependence view, for example, might be combined with one of the other accounts that is formulated in terms of personal level notions only. Thus, I do not want to claim that all these approaches are mutually exclusive. However, this is also not the place for trying to integrate as much as possible into some 'master account'. I hope to make clear the basic tenets of each account and how it relates to the other ones. In Ch. 3.1, I will discuss some empirical evidence that will help to argue for one or another of the possibilities.

2.2.2 Susan Hurley's Two-level interdependence view

Susan Hurley's account of the dependence of spatial perception on action includes a wide range of philosophical and empirical considerations. Furthermore, in her discussion of the relationship between action and perception (Hurley 1998; 2001), many different questions are tackled in parallel, ranging from very general considerations about the overall structure of the mind and its relation to the world to quite specific questions about the relations among different mechanisms at the sub-personal level. Her project is ambitious: she argues not only against what she takes to be the traditional understanding of the relationship between action and perception, but also against the received understanding of the relationship between the personal level notions of perception and action and the sub-personal level mechanisms from which they emerge.

Two general features are distinct of Hurley's approach compared to the other accounts that I will discuss: It explicitly takes into account sub-personal level mechanisms, and her approach centres on particular episodes of spatial perception instead of the capability of spatial perception.

Hurley develops her account of the constitutive dependence of perception on action by contrasting it with another form of dependence that she calls instrumental dependence. Both are ways in which perception can be dependent on action. In claiming that perception can constitutively depend on action, she questions the traditional framework of how action and perception are

connected. Within that traditional framework, only instrumental dependence is possible.

The contrast between instrumental and constitutive dependence will also help to see that various kinds of approaches mentioned in the historical overview in the last chapter are actually not proposing a constitutive dependence of perception on action. In particular, I will show that the accounts of the early Husserl and of Gibson merely defend an instrumental dependence of perception on action. The critique against these views is applicable to all accounts that argue that actual movements are constitutive of spatial perception.

I will first present Hurley's account of constitutive dependence based on the contrast to instrumental dependence. In the second step of this section, I will show that the accounts of Gibson and the early Husserl propose an instrumental dependence and not a constitutive one.

2.2.2.1 Instrumental dependence and constitutive dependence

One of Hurley's general purposes in developing her account is to argue against what she terms the 'traditional view' about action and perception. On this view, action is taken as output from mind to world and perception is seen as input from world to mind.⁴⁸ This picture includes a distinction between personal level notions, like experience and action, and sub-personal level notions, like sensory inputs and motor outputs that are conceived of as causal processes (Hurley 1998, p. 213).⁴⁹ It implies a deep separation between perception and action: perception is exclusively determined by the causal processes on the input side, while action is exclusively determined by the causal processes on the output side. Hurley's general agenda is to argue against this strong division. She aims to show that action and perception are determined by complex and dynamic interactions among sub-personal input and output processes – leading to a corresponding interdependence on the personal level, between perception and action.

48 She dubs this model the 'Classical Sandwich': action and perception are the bread while the mind is the filling; cf. e.g. Hurley (1998), p. 401.

49 The distinction between the sub-personal level and the personal level of explanations was originally introduced in Dennett (1969).

Hurley's crucial insight is that we have to distinguish between instrumental and non-instrumental dependence between perception and action and that only the latter expresses a constitutive relationship. The distinction is made in terms of directness. Whereas in the case of instrumental dependence, action has an impact on perception only indirectly, the impact is direct in the non-instrumental dependence. I will first introduce the notion of instrumental dependence with an example. This will help to make clear what is distinctive about the contrastive case of constitutive dependence.

Suppose you are at a royal wedding ceremony, thousands of others are there and you want to get a glimpse of the bridal couple, which is not easy in the middle of all those people. You move your head, stand on tiptoes etc. to see the couple. In other words, you act in certain ways in order to get to view certain things. One can put this as a means-end relation where the actions you undertake are the means to accomplish the end, which consists in seeing the royal couple. In a sense, this case exemplifies a relation of dependence: what I perceive is determined by how I move. I could not see the royal couple if I would not move thus and so (*ceteris paribus*). The movements are a means to make possible a certain perceptual content. Therefore, the dependence is aptly called 'instrumental'.

The dependence is indirect: movements alter my perceptual contents by altering my perspective on the world; they alter the causal configuration between the things in the world and my sensory systems by altering their respective spatial relationship. What could not have a causal impact on me in advance of the movement has a causal impact due to the movement.

This is the general structure of the instrumental relation: a certain perception is brought about by means of movements that establish a causal relation between the subject and an object that did not obtain in advance of the movements.

These movements are not necessarily part of intentional actions as in the example where there is an intention to see the bridal couple that leads to certain movements that serve this end. Thus, no active exploration of the environment is necessary for the instrumental case. The basic structure of instrumental dependence is present even if movements are non-intentionally made

and/or go on completely unnoticed (think of saccadic eye movements). In all these cases, movements change the configuration of the pattern of light on the retina.⁵⁰

Furthermore, a characteristic of the instrumental relation is that passive movements, in principle, could accomplish the same effects on perceptual content. To change the pattern of relevant stimuli it is not necessary that I move myself. Nothing speaks against the possibility that I am moved with the same result (think, e.g., of a king that is carried by his adjutants and orders them to lift him a little bit up so that he can see something behind a wall).

Finally, even movements of the environment can have the same effect in principle. This is because the core of the instrumental dependence consists of a changing causal relation between subject and world. Any sort of movement can bring about a change in this relation, be it of the subject or the environment.

On Hurley's account, every relationship between perception and action is instrumental where perception changes because of output states changing input states. She frames her account in terms of motor theories that emphasize the role of neural motor signals in explaining perception and draw on notions like efference, afference, and efference copy (cf. Gallistel 1980, Ch. 7; Hurley 1998, pp. 436–7). The notion of 'reafference' can be taken as a prime example of instrumental dependence. The more general concept of 'afference' is another word for input, referring to any information that proceeds from the periphery toward the central nervous system; the opposite notion is efference, or output, e.g. motor signals (Karnath and Thier 2012, p. 798). Reafferent signals comprise those afferent signals that are caused by the subject herself, thus being a kind of feedback. For example, in moving one's limbs one receives input that is caused by these movements itself; when quickly turning around in an otherwise static environment, a certain visual flow is generated

50 I will confine myself here to cases of visual perception, since these are the most discussed ones and usually serve as the paradigmatic case. This does not imply that for other sensory modalities analogue considerations do not apply. For example, you fulfil certain movements in order to be able to touch something.

that is caused solely by this movement. These are examples of reafferent signals, viz. input that is generated by movements, or output of the subject.

Perception depends instrumentally on action in case a change in perception is brought about by a change in input elicited by movements of the subject. This is the structure of instrumental dependence. Let me now turn to Hurley's notion of constitutive dependence of perception on action.

What are the characteristics of the constitutive (non-instrumental) dependence? The core idea is that action has a *direct* impact on perception. What this 'direct' means has to be brought out by contrast to the 'indirect' dependence that is the core of the instrumental dependence.

As we saw, an instrumental, or *indirect*, dependence of perception on action is instantiated when a change in the causal relationship between the environment and the sensory systems of the organism leads to a change in perception. In this case, action is a means to change the input pattern of what reaches e.g. the retina.

In contrast, a *direct* impact of action on perception does not proceed via this classical action perception loop. Thus, the constitutive dependence comprises cases where input is constant while there being an effect of output on perception. A prototype of such a non-instrumental dependence is the effect that 'efference copies' have on perception. Efference copies (or 'corollary discharge') are signals that are a copy of actual output signals and that are transmitted to other brain regions, providing a kind of instant feedback about how the system is about to behave. These signals are also transmitted to brain areas that compute perception-related processes. Given this, the following situation is intelligible as an instance of non-instrumental dependence: there is a constant input pattern, a changing output pattern (efference copy), and a changing perception. Only the output pattern and perception change, input does not. Therefore, a non-instrumental dependence is instantiated (Hurley 1998, p. 436).

A vivid clinical example given by Hurley are cases of paralyzed eye (pp. 372–3; cf. Gallistel 1980, p. 175). Patients with a paralyzed eye are still able *to try* to move their eye. Neural signals are transmitted that otherwise would lead to a corresponding eye movement. The surprising fact about these attempts to move the eye is that, although the retinal pattern is constant, they

have an effect on perception. The world seems to move. Clearly, this illusionary impression does not result from changes of input (as in the instrumental case) since the eye cannot move. The only thing that changes and therefore has to be taken into account to explain the phenomenon is the attempt to move the eye.⁵¹

The essential features of Hurley's notion of constitutive dependence can be summarized as follows. The core contrast between constitutive and instrumental dependence boils down to the contrast between direct and indirect impact that output can have on perception. Whereas in the instrumental case output determines perception by way of altering the input patterns on which perception relies, in the constitutive case there is a direct impact of action on perception. Thus, in the latter case output becomes part of the basis on which perception relies. "In distinguishing instrumental from non-instrumental dependence, we're trying, roughly, to capture the difference between action having an effect on a separate perceptual system and its sharing the constitution of that system" (Hurley 1998, p. 363).

Instrumental and non-instrumental dependence can both be cashed out in terms of a causal relation. This is especially clear for the instrumental case, but Hurley explicitly states that also the non-instrumental dependence can be a causal relation: "It is important to note that non-instrumental dependence here can be both a constitutive and a causal relation [...]" (Hurley 2001, p. 15).

Finally, the contrast between instrumental and non-instrumental dependence is made in terms of particular episodes of action and perception. This distinguishes Hurley's account from the other accounts I will discuss.

Let me add a few general notes about Hurley's approach. Her view is quite liberal in at least two respects: First, instrumental and constitutive dependence are not thought to be mutually exclusive. Both of them contribute in important ways to the way we perceive the world. Furthermore, she neither claims that every case of perception nor every aspect of perception is constitutively dependent on action, or output. She opts for a pluralistic view, in which different relationships are needed to explain different cases. For some

51 For more examples, see Hurley (1998), pp. 371–9.

cases, even the traditional view presents an intelligible explanation. In general, Hurley's strategy to challenge the traditional view about perception and action is to argue via counterexamples from neurology and via thought experiments and then generalize the structures found there. She is aware that what she gets with this strategy is only a refutation of the traditional view as a general conceptual framework for how perception, action and cognition work together, which does not rule out that for some explanatory enterprises the traditional view might be appropriate. She regards it as an empirical matter (Hurley 1998, p. 340). In effect, her view combines personal level approaches like the ecological approach (which she appreciates although it merely posits instrumental dependencies) with sub-personal level approaches like the motor theory of perception. Perception constitutively depends on action in virtue of the complex and dynamic sub-personal mechanisms among input and output, or afference and efference (Hurley 1998, p. 438).

I will discuss some more details of her account in Ch. 3.1.2. In the second section of this chapter, I will argue that the accounts of Gibson and the early Husserl fall short of arguing for a constitutive dependence of perception on action. Rather, both deploy an instrumental dependence in Hurley's sense.

2.2.2.2 Applying the notion of instrumental dependence to the accounts of Husserl and Gibson

To recap, the instrumental dependence essentially consists in a changing spatial *relation* between subject and environment that gives rise to certain perceptions. A change in this relation can be brought about by changes in either of the *relata*. Therefore, it does not rely on self-movement (active or passive) *necessarily* and hence it does not hold necessarily between *action* and perception but only between *movement* and perception.

Two of the accounts we mentioned in the historical overview are of this sort: the early Husserlian account and Gibson's ecological account.

Early Husserl

The instrumental dependence is present in the early writings of Edmund Husserl (Husserl 1983; 1991). In the historical overview in Ch. 2.1.1, I already

noticed that the key concept in Husserl's writings on the subject is *kinaesthesia* (cf. Claesges 1964, p. 64, n. 1). Literally speaking, the term means 'sensation of movement'. This was the meaning Husserl had in mind in his earliest writings on the issue.⁵² With regard to visual space perception, he claimed then that the association of visual sensation and sensation of movement grounds three-dimensional space, whereas vision alone only constitutes a two-dimensional visual field.⁵³ The central idea is thus that visual perceptual space is constituted by an association between visual sensations and sensations of movement.

In the first writings on perceptual space from the early 1890's, Husserl's ideas are still very vague and unsystematic. But at least two convictions are already present that remain important for him: on the one hand the general primacy of the psychological investigation, i.e. the descriptive and genetic analysis of perceptual representations (Husserl 1983, pp. 302–3) and, of course, the idea that movement has to play an essential part in that analysis. This is further developed in his lecture "Ding und Raum" ("Thing and Space") (Husserl 1991) from 1907, which is the first systematic account from Husserl on this question. In this lecture the meaning of *kinaesthesia* sometimes shifts to movement, sometimes stays with sensation of movement (cf. Ferencz-

52 In large parts of the literature on Husserl's account of perception, researchers (in my view mistakenly) argue that Husserl meant something like movement itself or even the system of possible movements. Cf. e.g. Claesges (1964), p. 64, n. 2: "Die Kinästhesie kann in ontologischer Einstellung als ‚Organbewegung‘ angesehen werden." ("In ontological perspective, kinaesthesia can be regarded as 'movement of an organ'"; my translation.) Cf. Neumann (1999), p. 137; Drummond (1979), p. 22; Mattens (2010), p. 171. As already said, the term 'kinaesthesia' was subject to various substantial revisions during Husserl's life. The significant shift in meaning of this central term is well described in Ferencz-Flatz (2014).

53 Husserl (1983), p. 305: "In der Natur der Tast- und Bewegungsempfindung ist der dreidimensionale Raum des Blindgeborenen begründet. In der Natur der [sic!] Gesichtssinnes ist begründet das zweidimensionale Gesichtsfeld. Dazu die besonderen Lok<al>zeichen und endlich die Verbindung der Gesichtsempfindung mit Bewegungsempfindung, wodurch eben immer nur ein dreidimensionaler Gesichtsraum erwachsen kann." ("Three-dimensional space for the born-blind is grounded in the nature of sensations of touch and movement. The two-dimensional visual field is grounded in the nature of vision. A three-dimensional space can only arise from local signs and the connection between visual sensation and sensation of movement"; my translation.)

Flatz 2014, pp. 24–8). Nevertheless, it is important to note that on this account a succession of particular movements constitute perceptual space. “Alle Räumlichkeit konstituiert sich, kommt zur Gegebenheit, in der Bewegung, in der Bewegung des Objektes selbst und in der Bewegung des ‚Ich‘, mit dem dadurch gegebenen Wechsel der Orientierung“ (Husserl 1991, p. 154; “All spatiality is constituted, comes into reality, by movement, by movement of the object itself and by movement of the ‘I’, by the thereby given change in orientation”; my translation). The perception of a physical body is thus constituted by a succession of percepts. “Der Körper muß sich drehen und verschieben, oder ich muß mich, meine Augen, meinen Leib bewegen, um ihn herumgehen und mich zugleich nähern und entfernen; oder endlich, beides muß stattfinden“ (pp. 155–6; “The object has to rotate and displace or else I have to move myself, my eyes, my body [Leib], go around it and at the same time approach it and diverge from it; or, finally, both has to happen”; my translation).

The basic idea seems to be the following: To perceive a physical and hence spatial object, it is necessary that certain movements happen to the effect that different sides of the object are presented to the subject. The presentation of the different sides has to happen in continuous movements to ensure that it is the same object to which the different sides belong. The movement can happen on the side of the subject or the object. The movements make possible the presentation of the object (p. 169). Thus, the movements (or the correlated sensations, respectively) are not *essentially* connected to visual sensation but only *functionally* (p. 170).

This clearly is a case of an instrumental relation between movement and spatial perception. All three elements of this kind of relation, as stated above, are in place: it is just movement (not action) that serves the function of constituting spatial perception; and it is only the relationship between subject and object that is crucial, hence, it is not even necessary that the movement happens on the side of the subject, movement of the object is enough.⁵⁴

54 Husserl’s conception of the constitution of perceptual space is, of course, much more complex than stated here. He distinguishes different kinds of kinaesthetic systems, like

The early Husserlian view thus does not express a constitutive dependence of spatial perception on action. Action is merely taken as a succession of movements that change the input in a way to allow for the perception of spatial properties. This is thus an archetype of an instrumental dependence of perception on action.

The second approach that rests on a similar claim is Gibson's ecological view of spatial perception to which I want to turn now.

Gibson's ecological view

The second historical example of a merely instrumental relation between spatial perception and action can be found in the account of Gibson (1979). For Gibson, perception is a process that is undertaken and explained by the activity of the whole perceiving organism (and not just by processes on the retina and in the visual cortices). It is the process whereby the "eye-head-brain-body system registers the invariants in the structures of ambient light" (p. 61). This registration fundamentally depends on movement: Gibson distinguishes two 'layers' of the ambient optic array, a "nonessential" layer that is constantly changing with movement, and an "essential" layer that stays invariant despite change (p. 73).

His description seems to imply a hierarchical picture of how the optic array is structured; however, I take it that his account is better described as proposing that the optic array has different kinds of elements or aspects, namely, variant and invariant (p. 74). The crucial claim is that the latter are only revealed by change in the former. "What is invariant does not emerge unequivocally except with a flux. The essentials become evident in the context of changing nonessentials" (p. 73).

Hence, perception consists in registering invariants; invariants are only registered when there is change in the array of light that hits the eye; therefore,

the possible set of eye movements or the set of head movements that are necessary for different aspects of perceptual space. In general, the idea seems to be that the set of the dimensions of possible movements determines the set of dimensions of the associated perceptual field. Thus, the two-dimensional space of movement of the eye is correlated with the two-dimensional visual field. A detailed discussion of Husserl's account in "Ding und Raum" can be found in Drummond (1979).

perception is tight to movement: “Observation implies movement, that is, locomotion with reference to the rigid environment, because all observers are animals and all animals are mobile. Plants do not observe but animals do, and plants do not move about but animals do” (p. 72). Gibson surely thinks that movement is a necessary condition on the possibility of perception. In addition, he thinks that bodily acts of the perceiving organism are the most important means to register the relevant invariant structures from the optic array.

However, his approach nevertheless posits only an instrumental connection between action and spatial perception. There is nothing in the theory that is specifically tied to *action*. All that is necessary is the generation of a visual flow by which invariants can be detected. Therefore, although Gibson often speaks about movements of the observer being crucial, other means of inducing change to the “superficial structure” of the optic array can have the same effects, too. As sources of change in this structure, he explicitly counts events in the environment, movements of the subject, and changing lighting conditions (p. 87).

Thus, Gibson’s approach clearly endorses the characteristics of the instrumental relation of action to spatial perception. What is crucial is only movement, whether active or not does not make any difference; even movement in the environment is sufficient since effectively it is a changing relation between subject and environment that is explicatory (cf. Mossio and Taraborelli 2008, p. 1332).

Accounts like that of the earlier Husserl and Gibson that claim that successions of sensation brought about by movements explain spatial perceptual space state only an instrumental relation, in which movement is a means for the organism to perceive spatial features. Therefore, it is no surprise that the explanatory weight in these conceptions is not carried by anything that is essentially related to action but only by something that is contingently related to (some kinds of) action, namely movement.

We can see thus that, in general, approaches that centre on actual movements in cashing out the dependence of spatial perception on action fall short of arguing for a constitutive dependence. Any account that relies on the idea

that spatial perception is dependent on a changing spatial relation between subject and object defends a mere instrumental relation (see figure 4).

Instrumental dependence of spatial perception on action

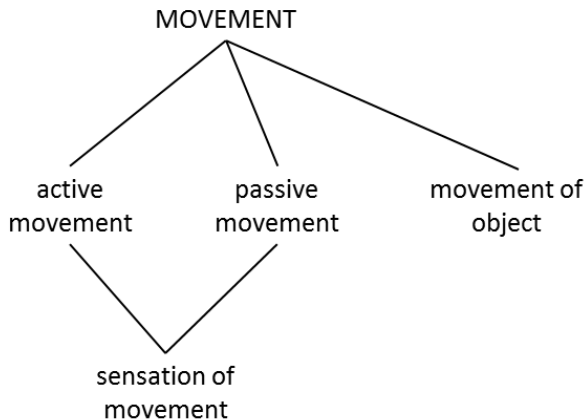


Figure 4: Proposed understandings of action that make up a mere instrumental relation between action and spatial perception. Action in this case is understood as actual passive or active movement of the subject. A mark of the instrumental dependence is that, in principle, the same effect can be obtained from movement of the subject, or of the perceived object. A further possibility is that not movement but sensations of movement on the side of the subject are crucial.

2.2.3 Alva Noë's enactive approach

On Alva Noë's (2004) view, what constitutes spatial perceptual content is a certain kind of practical knowledge. The relevant knowledge is not a form of propositional knowledge (pp. 117–22). The content of the knowledge in question consists in sensorimotor contingencies: it is a grasp of the effects that movement *would have* on sensation. In most parts of his work, this idea is

spelled out with reference to examples of perceiving particular objects. For example, when one sees a tomato one always sees only a certain side of it. Nevertheless, it is compelling to say that the content of one's perception is not just specified as "part of a tomato" but "a tomato" (taken as a solid, voluminous, three-dimensional object). How is it possible that we can attribute to ourselves a perception of an object when all that we see is just one particular side of it?⁵⁵ Noë's solution to this problem, which he calls the 'problem of perceptual presence' (pp. 59–65; p. 77), is that we see the tomato since we "understand, implicitly, that [our] sensory relation to those parts [that we do not, strictly speaking, see] is mediated by familiar patterns of sensorimotor dependence" (p. 77). In other words, we see the tomato as something with certain spatial properties like size and shape thanks to our implicit knowledge of how we would see the currently hidden parts if we, or the tomato, would move thus and so. Here is his view condensed in one statement:

We are not given the visual world all at once as in a picture; we must reach out and grasp the detail (as it were) by movements of our eyes and head. We possess the sensorimotor knowledge to be effective in our exploration. It is this mastery that is the basis of our sense of the presence to vision of what is in fact beyond our reach. It is this mastery that is the basis of perceptual content. (p. 75)

The same way of explanation also pertains to the question of why we see objects as left, right, up or down. In this regard, Noë argues: "To experience an object as off the left is to experience it as standing in a relation to one which one grasps as constituted by patterns of sensorimotor dependence" (p. 87). Again, what constitutes the spatial content of my perception is an implicit understanding of the changes to my sensation elicited by certain movements. In this regard, he also talks about "sensorimotor profiles". These pertain either to (kinds of) objects (p. 78) or to positions in egocentric space

55 This phenomenon was also tackled by Husserl under the heading of the "horizontal structure" of experience on various occasions; e.g. Husserl (1991), pp. 55–60. Noë seems unaware of this.

(p. 87), specifying how sensory stimulation varies with movement. The sensorimotor profile is thus the sum of the known sensorimotor contingencies related to an object, a kind of object⁵⁶ or a point in egocentric space.

In sum, on Noë's account, one can only have spatial perceptual contents if one has a practical grasp of how one's sensation would alter if one were to move in relation to the seen object or scene, that is, if one grasps the sensorimotor profile of what one sees. In a modification of Kant's famous statement that intuitions without concepts are blind, Noë says, "intuitions [...] without knowledge of sensorimotor significance of those intuitions, are blind" (p. 11).

Let me now turn toward the role that movement plays in Noë's account. There are three possible reasons to suppose that on his account spatial perception is only instrumentally related to action in terms of Hurley's notion, which I introduced in the last section. The first reason is that actual movements are necessary for every case of spatial perception, which some statements made by Noë suggest. The second is the observation that at some point in the development of the relevant sensorimotor knowledge actual movements are indeed necessary, namely in the initial stage when the knowledge is learned by interaction with the environment. The third reason concerns the fact that Noë's account at least relies on counterfactual movements. I will discuss these reasons in turn.

The first reason for regarding the account of Noë as proposing merely an instrumental dependence between action and spatial perception consists in his statements that indicate that vision is similar to touch (pp. 16–7), i.e. an active exploration of the environment: "[P]erceiving is an activity of exploring the environment, one that requires the perceiver's mastery and exercise of sensorimotor knowledge [...]" (Noë 2008, p. 694).⁵⁷ Formulations like this

56 It is not entirely clear whether the sensorimotor profile pertains to particulars or to kinds. I think it is plausible to suggest that the profile pertains to kinds of objects. All spherical objects, e.g., share the same sensorimotor contingencies.

57 Cf. Noë (2004), p. 75: "We are not given the visual world all at once as in a picture; we must reach out and grasp the detail (as it were) by movements of our eyes and head. We

suggest that perception depends on actual movements, that one has to move in relation to one's environment for there to be any spatial perception at all, while the role of sensorimotor knowledge is to guide these explorative movements. If true, this would obviously render the account into one that merely states an instrumental relation between perception and action, similar to the accounts of Husserl and Gibson that I discussed in the preceding chapter. Since on such a view, perception is dependent on movement in that movements change the causal setting of subject and environment thereby making possible perceptual content. However, I think one should not take these statements at face value. Other statements indicate that he does not think that perception depends on actual movements. Thus, I think these statements are rather careless formulations of his view that should not base the interpretation of his account. I want to present an alternative interpretation of his account that does not imply this consequence. Thus, the first of the three reasons to think that Noë effectively proposes only an instrumental dependence of perception on action is not convincing.

The second reason is that the development of sensorimotor knowledge depends on the exploitation of the instrumental dependence between action and perception. Thus, at least in the aetiology of the relevant sensorimotor knowledge, actual movements play a crucial role. The knowledge has to be acquired somehow in the first place. One might suppose an explanation of the development of this knowledge that draws on phylogenetic developments, which would rule out the threat of a mere instrumental dependence. However, the following three observations indicate that that Noë has an ontogenetic development of sensorimotor knowledge in mind.

First, he repeatedly refers to results from studies with inverted goggles. In the studies he refers to,⁵⁸ participants report that their perception is initially

possess the sensorimotor knowledge to be effective in our exploration"; p. 228: "Perceptual experience, according to the enactive view, is an activity of exploring the environment drawing on knowledge of sensorimotor dependencies and thought."

58 He refers to Stratton (1897), Kohler (1951) and Taylor (1962); cf. Noë (2004), pp. 7–11, pp. 91–6.

inverted but restored after a while, and especially after they get used to interacting with their environment while wearing the goggles.⁵⁹ He argues that what accounts for the supposed changes in spatial layout of perception that subjects wearing such goggles undergo is the change in sensorimotor knowledge. Therefore, there seems to be some ‘plasticity’ of sensorimotor knowledge that would not be expected if it were the result of a phylogenetic development. I take it that properties of our ways of information processing in general that are to be explained by phylogenetic developments are generally such that it is very hard if not impossible to alter them.

A second reason for supposing an individual ontogenetic development is his reference to cases where congenitally blind people come to see due to surgery. In these cases, it takes some time until, if at all, normal vision is established. Noë interprets this as the acquiring of the relevant sensorimotor knowledge (Noë 2004, pp. 3–7).

Finally, one can find passages like the following two. “Only through *self*-movement can one *test* and so *learn* the relevant pattern of sensorimotor dependence” (p. 13).⁶⁰ “Perceptual experience acquires spatial content thanks to the establishment of links between movement and sensory stimulation” (p. 102).⁶¹

In sum, one can assume that the relevant sensorimotor knowledge is acquired individually by learning associations between movement and changes in sensation. Therefore, at least initially for the establishment of sensorimotor knowledge, he posits a mere instrumental relation between movement and spatial perception. The general idea seems to be that the exploitation of the instrumental relation makes possible the acquisition of the relevant

59 There are some issues regarding how to interpret the results of these studies. Furthermore, not all results could be reproduced; cf., e.g. Linden et al. (1999) and Smith (manuscript), pp. 7–9. See also section 3.1.3 above for a detailed discussion of these cases.

60 I cannot see that self-movement is necessary for the learning of sensorimotor contingencies on this approach. Movement is also experienced in case it is passive. Therefore, the relevant dependencies of changes in sensation to patterns of movement might also be learned by passive movements. Noë does not argue for his claim that active self-movement is necessary.

61 This is also strongly reminiscent of views held by the early Husserl, e.g. Husserl (1983), pp. 308–9.

knowledge, which then takes over the role of actual movements. Later on, one does not have to move in order to perceive because one already knows (or grasps) what would happen if one were to move.

One might argue that, given the relevant sensorimotor knowledge initially and necessarily relies on actual movements, the account ultimately states merely an instrumental relation between action and perception. Self-movement is the means to enable me to see spatial properties in that I unify a series of percepts that are generated by my movement into a persistent spatial perception. This is at least a necessary developmental stage according to the theory.

However, against this consideration one can argue that the fact that the relevant sensorimotor knowledge is established by exploiting the instrumental relationship between action and perception does not imply that the dependence of perception on this knowledge is itself instrumental. Hence, even if the instrumental relationship between action and perception does play a crucial role in the development of the constitutive relation between sensorimotor knowledge and spatial perception, it is not a convincing reason to regard the latter relation as merely instrumental as well.

Let me turn to the third reason one might have to argue that Noë only defends an instrumental dependence. One might interpret the account as claiming that particular counterfactual movements constitute spatial perception. On this interpretation, it would still be the case that what explains my perceptual content are actual movements and the changing causal relation they elicit, only that I do not have to actually conduct the movement because I already know of the consequences the movement would have for my sensation. What ultimately explains the perception of spatial properties is the changing causal relation between perceiver and environment and even so in mature humans since there, the process is present in the knowledge of how sensation would alter by certain movements one had acquired before. The practical knowledge can be taken as a mere surrogate of actual movements that serves the same function. The following quote from Noë fits nicely with these considerations: “It is intuitively plausible, for example, that the circularity of a plate becomes available in encounters with its changing perspectival shape as one moves (or would move) with respect to it [...]” (p. 228).

Does this line of thought ultimately render the proposed relation between action and perception into a mere instrumental one? Before, I argued that the core of the instrumental relation is that perception is dependent on action in the sense that action changes the causal relation between the perceptual systems and the environment, what enables the subject to perceive things it would not perceive without movement. Given this, the relation between sensorimotor knowledge and perception is not instrumental on Noë's account. There is no changing causal setting, since there is no actual movement happening. The relation of sensorimotor knowledge to perception can be taken as a constitutive relation in terms of Hurley's notion.

To sum up, how is the idea that action is a constitutive condition on perception cashed out in Noë's account? Action plays a crucial and necessary role in the establishment of sensorimotor knowledge, which plays the key part in this account. In the development of this knowledge it is the instrumental relation of action to perception that is exploited, it is the learning of how the sensational pattern of (kinds of) objects varies with patterns of movement. What is constitutively linked to perception is the sensorimotor knowledge itself that is established throughout this development. I have considered three reasons to suppose that Noë merely defends an instrumental dependence of perception on action. I think that all three considerations are inconclusive.

However, I will come back to Noë's approach in Ch. 3.1.4, where I will argue based on experimental findings using sensory substitution devices that the sensorimotor knowledge approach is unconvincing since there are cases the knowledge about how sensation would alter with movement does not lead to spatial perception. This speaks against the central claim endorsed by Noë that spatial perception consists in a mastery of this sensorimotor knowledge.

With these considerations about Noë's approach, I will turn to accounts that claim in one or the other way that dispositions to action form a constitutive condition on spatial perception. The final section of this chapter is devoted to two accounts that centre on the embodied nature of human subjects, namely those proposed by Shaun Gallagher and Maurice Merleau-Ponty.

2.2.4 Embodiment approaches: Shaun Gallagher and Maurice Merleau-Ponty

In this section, I want to discuss two accounts that assign a crucial role in the explanation of perceptual space to the body. These are the accounts of Shaun Gallagher and Maurice Merleau-Ponty, respectively. Both accounts figure in this discussion of the claim that action is a constitutive condition on spatial perception since in both accounts the practical bodily engagement with the world is taken as the *explanans*. In both accounts, the relevant notion of action is inextricably linked to embodiment. It will turn out that the notion of the body schema is central for both positions.

On both views, the practical engagement of the body with the world that is beyond the conscious access of subjects is supposed to explain the spatial structure of perceptual space. Thus, action figures in these accounts as the anonymous and habitual workings of bodily mechanisms, which ground fluent interactions with the world even without conscious control. Examples for this kind of practical involvement are such capacities as maintaining balance, quickly reacting to external stimuli without any planning or deliberation, grasping things in the vicinity without conscious control etc. All these activities can be fulfilled automatically, and indeed are often fulfilled this way in daily life. It is with these activities of the body that the notion of body schema is most strongly associated. We will see that in Merleau-Ponty's account the position finds its most radical articulation in the claim that the living body is a subject in its own right. He claims that the activities of this subject constitutes the nature of perception and experience that is phenomenally available to us as persons.

This section has two parts. First, I will present Gallagher's position, which is unfortunately quite ambiguous on central questions, as we will see. Merleau-Ponty's account, as articulated in his *Phenomenology of Perception*, presents a much more precise articulation of the same basic ideas. I will end this section with a brief summary of both accounts.

2.2.4.1 Embodied action I – Shaun Gallagher

In his monograph *How the Body Shapes the Mind*, Shaun Gallagher claims that “one of the important functions of the body in the context of perception and action is to provide the basis for an egocentric spatial frame of reference” (p. 59; cf. Gallagher 2003, p. 61). I want to focus my discussion of Gallagher’s position on the following points.

First, I want to take a short look at what he means by ‘body’.

The second and third point of my discussion pertain to the question of how Gallagher thinks that the body constitutes perceptual space. Two lines of argument in his work are supposed to shed light on the constitutive basis of spatial experience, focussing on proprioception and body schemata, respectively. However, I will argue that each strand, and also the relationship between both, remain dubious.

Physiology or proprioception?

Let me start with the first point regarding the meaning of ‘body’. What does the above-cited claim that “the body provides the basis for an egocentric spatial frame of reference” mean? There are at least two possibilities, which Gallagher does not distinguish. This leads to problems in interpreting his account.⁶² The two possibilities are: (1) the actual physiology of the body determines the egocentric structure of perception and (2) a representation of the body determines the egocentric structure of perception.

Passages like the following suggest alternative (1): “One of the important functions of the body in the context of perception and action is to provide the basis for an egocentric spatial frame of reference” (Gallagher 2005, p. 59). “The fact that perception is perspectively spatial is a fact that depends precisely on an implicit reference to the spatiality of the perceiving body” (p. 137). Furthermore, the reference to Jakob von Uexküll (1920; Uexküll and Kriszat 1956) and to his conviction that perception is dependent on the physiology

⁶² This observation is shared by de Vignemont (2006), p. 7.

of the perceiving organism, in particular its sense organs and abilities of movement, suggests that Gallagher aims to explicate how the physiology of the body determines perception (Gallagher 2005, p. 140).

On the other hand, there are statements that suggest (2): “If the spatiality of action and the visual perception of the world are egocentrically organized by an implicit reference to our bodily framework, the *awareness* that is the basis for that implicit reference cannot itself be based on the egocentric framework of visual perception without the threat of infinite regress” (p. 60; my emphasis). “In its *prenoetic* roles the body functions to make perception possible and to constrain intentional consciousness in various ways” (pp. 138–9). These statements indicate that a representation of the body determines perception.

Both hypotheses are plausible, *prima facie*. However, they should be kept apart. Of course, physiology plays a role in determining the structure and possible contents of perception: humans can e.g. only see a distinct part of the colour and sound spectrum. The physiology of our bodies determines the kinds of perception we enjoy and the limits of what we can perceive within the modalities.

However, I think that Gallagher wants to defend (2). His central argument for the possibility of proprioception to ground the structure of exteroception (see below) would be superfluous if he thought that the mere physiology of the body was crucial.

I take it that Gallagher simply fails to delineate reading (1) from alternative (2). In what follows, I will assume that some representation of the body is supposed to constitute perceptual space. Let me now turn to the discussion of his argument to the effect that proprioceptive representations ground the egocentric structure of perceptual space.

Avoiding a possible regress

Gallagher wants to defend the thesis that a certain representation of the body constitutes the spatial structure of perceptual space. The relevant representation of the own body is proprioceptive representation. Since he takes proprioception as a kind of perception, Gallagher sees an immediate complication: If the representation of the body that is supposed to constitute the egocentric

frame of reference in perception was perceptual itself, it must be ruled out that it is itself structured egocentrically. Otherwise, the thought that proprioception is the basis of egocentric exteroception would not be intelligible.⁶³ His conclusion is that „proprioceptive awareness [...] operates in a non-perspectival, intra-corporeal spatial framework that is quite different from the egocentric structure of action and exteroceptive perception” (p. 60).⁶⁴

Let me turn to Gallagher’s way of dealing with the threat of regress and of arriving at his conclusion.

Gallagher (2003) argues for a principal distinction between proprioception (“non-perceptual awareness”) and exteroception (“perception”). He wants to defend the view that proprioception is not structured egocentrically, in contrast to exteroception. This argument is supposed to be necessary for the intelligibility of the claim that egocentric perception is grounded in proprioception.

Gallagher defines proprioception as “the bodily sense that allows us to know how our body and limbs are positioned” (2005, p. 43). He distinguishes two kinds of proprioception. On the one hand, proprioception can refer to the conscious shift of attention towards parts of one’s own body – “reflective self-examination” (2003, p. 56). Since this kind of proprioception is similar to perception in that parts of the body are identified as objects and explicitly delineated from other things,⁶⁵ it cannot be the searched-for basis of other kinds of perception. Accordingly, Gallagher is after a different notion.

63 “If one accepts the premise that sense perception of the world is spatially organized by an implicit reference to our bodily framework the awareness that is the basis for that implicit reference cannot depend on perceptual awareness without the threat of infinite regress” (Gallagher 2005, p. 137). Gallagher accuses others (namely Antonio Damasio and Gibson) of not having seen this problem and of conceptualizing proprioception analogue to other forms of perception what would lead to the infinite regress and render their accounts unconvincing.

64 One might dispute that there is a thread of an infinite regress at all and claim that the egocentricity can be taken as primitive. Gallagher does not consider this possibility.

65 Whether this implies that this form of proprioception is egocentrically structured as one might suppose and which consequence this would have for his account in which ‘egocentric’ is a synonym for ‘body-centred’ is left open here.

This other form of awareness of the body is supposed to be an unconscious, implicit grasp of the pose and position of limbs that enables the control of actions (p. 59). The important point he needs to show is that the spatial relationships are not represented egocentrically in this case. According to Gallagher, in proprioception there is no perspective on the body, no point of reference, relative to which spatial relations are specified (Gallagher 2003; and 2005, pp. 137–8).⁶⁶ Whereas in exteroception, distances and directions are represented relative to the body, in proprioception, spatial relationships are represented *absolutely*. This is supposed to be the reason why it does not make sense to say that one part of the body is further away than another one. Nor is the right hand ever regarded as an additional left hand if it is held at the corresponding position. He sums up his view pointedly:

Generally speaking, the proprioceptive spatiality of the body is not framed by anything other than the body itself. In other words, proprioception is a non-perspectival awareness of the body. (Gallagher 2003, p. 62)

What he means to argue, that proprioception is “framed by the body”, can be made clear by distinguishing between two ways in which bodily locations can be specified, namely A-locations and B-locations.

A-locations and B-locations

Bermúdez distinguishes two different ways in which one can specify a given location on the body (Bermúdez 1998, p. 153–61; 2003; and 2011, p. 174–7). The following example from Bermúdez helps to reveal the contrast:

- (1) I have a pain at a point on the sole of my right foot when I am standing up, and my right foot is resting on the ground in front of me.
- (2) I have a pain at the same point on the sole of my right foot when I am sitting down, and my right ankle is resting on my left knee. (Bermúdez 1998, p. 154)

66 He refers to O’Shaughnessy (2008) and Bermúdez (1995) and regards himself being in the tradition of Merleau-Ponty and Jean-Paul Sartre.

Do I feel the pain at the same location in both scenarios? Bermúdez argues that this question has no definite answer since one has to distinguish two kinds of location, A-location and B-location. The answer to the question depends on the kind of location one takes into account.

The difference of the two kinds of location is based in the fact that the human body is made up of moveable parts that are put together via joints. A-location is specified by its distance and direction to the respective nearest joints. B-location is specified with reference to the joints that lie between the torso and the limb on which the point in question is located.

Applied to the example, the A-location is identical in (1) and (2), whereas the B-location is different in both scenarios: the location of the pain is the same in both cases relative to my right ankle; it is different, however, relative to the torso in both cases.

Gallagher can be interpreted as referring to A-locations in claiming that proprioception employs an absolute frame of reference. This means that locations represented in this way stay the same despite bodily movements. Therefore, he claims, “proprioception follows the contours of my body, but not from a perspective” (Gallagher 2003, p. 63).

Some critical remarks regarding the avoidance of the infinite regress

Let me note some critical comments regarding the way Gallagher wants to avoid the infinite regress.

First, it should be noted that the distinction of A- and B-location is not distinctive of the human body. It can be applied to many other objects, too. In a certain sense, the rust on the door of my car changes its location when I open the door, namely with respect to the remaining parts of the car (analogue to the B-location); but it remains at the same location in another sense, namely with respect to the hinges of the door (analogue to the A-location). In allowing for the distinction between A- and B-location, the representation of the body is not fundamentally different from representations of other objects that are made up of moveable parts.

Furthermore, the distinction between A- and B-locations seems to be a mere difference in frame of reference. However, it is nothing extraordinary

that the same moving point changes its location or not depending on the frame of reference relative to which it is specified. This applies to any case of moving locations: for example, the city of Munich does not change its location relative to other cities in Germany although it changes its location relative to cities in North America due to the movement of the Eurasian plate.

These two comments emphasize that the proposed spatiality of proprioception is no spatiality *sui generis* of the representation of human bodies. The analysis of different ways in which locations might be represented is applicable to other objects beyond human bodies. Hence, we should not expect too much of an explanation for the peculiar nature of body representation from stating these features.

Third, the foundation by (absolute) A-locations seems to be problematic in that thereby no integrated model of the body can be established. If bodily locations are specified with respect to the nearest joints, all that is established is a bunch of unrelated bodily locations. However, their respective relation remains unclear. This latter information is only given by B-locations. However, these are not available to Gallagher's conception of proprioception since they specify locations to a certain point of reference, namely the torso, and thereby count on his view *per definition* as egocentric; but to avoid the infinite regress he needs absolute positions.

Fourth, in Gallagher's account bodily space and environmental space are separated. One might wonder whether the assumption of an integrated frame of reference in which both bodily positions and positions of objects in the environment are represented is more plausible for e.g. the explanation of goal-directed acts. On this proposal, computations of converting different kinds of locations that might complicate and slow down the control of movements would not be necessary. On Gallagher's view, however, something like this seems necessary.

Fifth, it is not entirely clear how talk of 'left' and 'right' is possible without assuming any points or axis of reference. Gallagher himself, in explicating proprioceptive awareness, talks about the "left [!] hand" not becoming a right one, if I hold it near the right shoulder (2003, p. 63). However, it is unclear

how the talk of left and right with regard to absolute positions can be understood.

These points may not undermine Gallagher's position entirely. However, they show that there are some caveats to his account. I want to leave these issues aside though and discuss the way that proprioceptive awareness is supposed to ground egocentric perceptual space on Gallagher's view.

Constitution of egocentric space

Unfortunately, the search for an explicit answer to the question of how bodily awareness constitutes egocentric space in Gallagher's work remains unsuccessful. While he develops the first part of the argument (how to avoid the infinite regress) in detail, the remarks on the second part about the constitutive relation between bodily awareness and perceptual space are quite vague (Gallagher 1995; 2003; 2005; 2009).

Gallagher (2009) at least shows how the constitution is *not* to be conceived. He criticises a study of Asifa Majid et al. (2004), who propose that the egocentric frame of reference is to be regarded as derived from an allocentric, object-centred frame of reference. Their basic idea is that one can derive the egocentric frame of reference from parsing the subject's body according to its internal spatial and functional organisation. The parsing results in a set of axes that are projected beyond the body and make up the frame of reference for perception. This establishes a frame of reference that allows judging other things as being located left, right or in front of the subject (p. 109).⁶⁷

Gallagher rejects such a derivation of the egocentric frame of reference from an allocentric, object-centred frame. On his view, the egocentric frame of reference is the basis of all other frames of reference (Gallagher 2009, p. 354) and not itself based on any other frame of reference.

⁶⁷ Their position is strongly reminiscent of the view that is criticized in Campbell (1994), pp. 9–10.

Practical engagement and body schemata

How does Gallagher himself think about the constitution of the egocentric frame of reference? Gallagher (2005), esp. pp. 138–52 gives some hints. Interestingly, the spatiality of the subjects' body plays only a secondary role here. Instead, he focusses on the subject's practical engagement with the world. Gallagher refers to Uexküll, Merleau-Ponty, Gibson and others. The key element is the body as represented in the body schema.

The body projects a pragmatic and egocentric spatial framework that does not correspond precisely to objective (allocentric) spatial measurements. Body schemas enable us to find our way in space; to walk without bumping into things; to run without tripping and falling; to locate targets; to perceive depth, distance, and direction; to throw and to catch a ball with accuracy. (p. 141)

The egocentric spatial frame of reference is obviously tightly related to the body schema that, as part of the prenoetic bodily awareness, is constitutive of the spatial structure of perception.

What does Gallagher mean by 'body schema'? Gallagher describes the body schema or schemas⁶⁸ as those unconscious sensorimotor processes that enable the subject to interact dynamically and flexibly with the environment based on its intentions. "The body schema [...] involves certain motor capacities, abilities, and habits that both enable and constrain movement and the maintenance of posture" (p. 24; cf. pp. 32–4; pp. 37–8). "[T]he body schema reflects a practical attunement of the body to its environment" (Gallagher 1995, p. 239; cf. pp. 226–239).

These quotes make clear that the body schema comprises a range of basic capacities of how the embodied subject can react toward stimuli or accomplish basic movements, thereby enabling the organism to interact with its environment. One important property of the functioning of the body schema for Gallagher is that it operates, in principle, on a pre-conscious level. This is the key feature that distinguishes it from the body image that he takes to be

⁶⁸ The plural 'body schemas' refers to particular motor programmes that each are defined by a particular pose or movement like the movement of hand to mouth; cf. Gallagher (2005), p. 24, n. 5. Gallagher uses both, the singular and plural version.

available to consciousness (Gallagher 2005, p. 26).⁶⁹ The body schema is thus a “system of sensorimotor functions” that involves “tacit performances – pre-conscious, subpersonal processes that play a dynamic role in governing posture and movement” that works “close to automatic” (ibid.).

Gallagher’s claim is that this body schema is the central feature that “shapes” consciousness and, in particular, perception.

In its *prenoetic* roles the body functions to make perception possible and to constrain intentional consciousness in various ways. Here are included operations of body schemas – the body’s non-conscious, sub-intentional appropriation of postures and movements, its incorporation of various significant parts of the environment into its own organization. (p. 139)

One difficulty with Gallagher’s argument here is that in describing the role of the body schema with regard to perception, he does not sharply distinguish between the claim that the working of body schema has an effect on conscious perception and the claim that it is constitutive of conscious perception. In general, he seems aware of the difference: on another occasion, in stating the impact that emotions have on perception, he distinguishes between both understandings (p. 151). The reading there suggests that he uses ‘shapes’ for ‘being constitutive of’. Nevertheless, in describing how the body schema relates to experience, he frequently speaks about the “effects” that the workings of the body schema have, or how the body schema “enables” the subject to perceive.

With regard to the important distinction between instrumental and constitutive dependence, Gallagher’s writings are thus ambiguous. Speaking of effects that the body schema has on perception might indicate a rather instrumental relation to perception instead of a constitutive one. However, I take it that he wants to defend a constitutive claim, but that he fails to delineate both dependencies sharply. This results in mixing up examples for instrumental and constitutive dependence of perception on action (pp. 139–40; pp. 144–5).

⁶⁹ However, the functioning of the body schema might be altered by the body image or other conscious states (Gallagher 2005, p. 27). See *ibid.*, pp. 24–30 for more details about how he distinguishes between body image and body schema.

Summary of Gallagher's account

Let me look on Gallagher's overall account. He develops two lines of thought to explain spatial perception. On the one hand, Gallagher puts a lot of effort in arguing for the distinctive non-perspectival way the body has to be represented in proprioception for it to be the basis of exteroception. On the other hand, he states that the basic practical bodily capabilities that make up the body schema are what constitute egocentric perception. Gallagher does not link the two claims, however. Moreover, it is dubious if it is possible to do so.

In particular, from Gallagher's own theoretical perspective, one would expect that the body schema be linked to proprioception in important respects. Why would he have to argue for the claim that proprioception does not employ an egocentric frame of reference at all if proprioception were not relevant for the functioning of the body schema? However, surprisingly, regarding the relationship between body schema and proprioception, he says nothing beyond the claim that proprioceptive information is part of the input that is used by the processes of the body schema (pp. 37–8).

His basic conviction seems to be that a prenoetic bodily awareness constitutes the egocentric structure of perception. The body schema is a central part of this bodily awareness. The latter comprises basic sensorimotor programmes and abilities that enable basic goal-directed coordinated movements. These include spatial information about the position of limbs given in proprioception.

If this is right, a central statement of Gallagher's has to be revised: "The fact that perception is perspectively spatial is a fact that depends precisely on an implicit reference to the spatiality of the perceiving body" (p. 137). In order to get the actual account of Gallagher, it is necessary to add the body schema, which is a system of capacities on his understanding.

What has now become clear is that, on Gallagher's account, the egocentric spatial structure of perceptual experience is not just based in some representation of the spatial structure of the body in proprioception as he claims here and there. In contrast, the body schema, understood as a collection of basic motor capabilities that draws on proprioceptive information, is the essential element in constituting egocentric space.

However, the relationship between the non-perspectival proprioception and the body schema is dubious in Gallagher's framework. He does not elaborate on the exact relation between the two. In addition, there seem to be some issues in spelling out this relationship given his views. One might suppose that a body representation in absolute co-ordinates is not useful for the functioning of the body schema. Such a representation neither includes the relative positions of different body parts nor is it clear, as stated above, that it is *one* body that is so represented. This seems to be in contradiction with the supposedly holistic character of the body schema and thereby with a basic condition on the possibility that the body schema can fulfil its supposed function. Take for example the maintenance of balance that Gallagher uses frequently as an illustration for the working of the body schema. To be able to maintain balance depends on the simultaneous coordination of very many body parts. Changes in some parts have to be compensated for by changes in other parts. Without this holistic organization of the body schema, a high-wire act or even upright gait would be impossible. The holism is an integral part of the body schema. However, it is difficult to explain it with the notion of proprioception that Gallagher proposes. Regarding these questions there are large caveats in his conception that might be avoided somehow but, as far as I can see, his work does not offer any solution.

In sum, Gallagher's position only pretends to ground the nature of spatial perception in the represented spatiality of the body alone. It is doubtful after this discussion whether this would be possible at all. Ultimately, the explanatory weight is carried by the practical engagement of the embodied subject with its environment, subserved by the body schema. However, Gallagher is silent about the details of the constitutive relationship between practical 'attunement' to the environment and perceptual space. Nevertheless, this idea makes his position akin to positions like that of Merleau-Ponty, to which I now turn.

2.2.4.2 Embodied action II – Maurice Merleau-Ponty

The basis of my discussion is Maurice Merleau-Ponty's *Phenomenology of Perception* (2002).⁷⁰ In contrast to Gallagher, Merleau-Ponty spells out in more detail how the body is supposed to constitute the spatiality of perception. I will mainly focus on two sections of Merleau-Ponty's monograph: "The spatiality of one's body and motility" (Part I, Ch. 3) and "Space" (Part II, Ch. 2).

Overview of the essential issues

I take the following three issues as most important with respect to Merleau-Ponty's account of the constitution of spatial perception. The explication of them will result in a firm understanding of the basic tenets of his view.

First, since the body is all-important, I will clarify the understanding of the body within the account. Merleau-Ponty, inspired by Husserl, distinguishes two meanings of 'body'. On the one hand, the body figures as a physical object in the world that is similar to all other material objects ('body'). On the other hand, the body figures as that by which one perceives, feels, acts, in short: lives ('living body').

Second, I will explicate how, according to Merleau-Ponty, the living body is supposed to constitute perceptual space. Central to this point will be the notions of figure and ground, 'gearing' ('la prise'/'Anhalt') and, again, the body schema.

Third, I will also look at some of the empirical evidence Merleau-Ponty puts forward in support of this view.

The living body

Let me start with the notion of the living body that is key to Merleau-Ponty's account. He claims, "far from my body's being for me no more than a fragment of space, there would be no space at all for me if I had no body" (Merleau-Ponty 2002, p. 117). In which sense does he refer to the body in this quote?

70 This edition was first published in 1962. (However, page numbers are not identical in both editions.) I will also rely on Merleau-Ponty (1945), and (1974).

As indicated, Merleau-Ponty sharply distinguishes between two different notions of ‘body’. In this quote, he does not refer to the body in the sense of a mere object, located in the world as other objects. This way of using ‘body’ is appropriate in some cases. In a certain sense, human bodies are just objects situated in space and time just as any other object. However, this is not the sense of body that is meant here. The body that grounds perception is the living body, the body regarded as that by which we perceive and act. In addition, this one can never be an object of perception. Hence, it is not the body as the thing one can see in a mirror, or touch. It is not the body as a possible object of perception, investigation or action. It is the body as it figures in the acts of perceiving, investigating and acting. It is the body in its function to enable one to get in contact with the world. It is the body as enabling me to live in the world.⁷¹ The following quote summarizes the distinction nicely:

[T]he first is a system of bones, muscles and flesh brought down at a point of space, the second shoots through space like a rocket to reveal the external object in its place. In so far as it sees or touches the world, my body can therefore be neither seen nor touched. What prevents its ever being an object, ever being ‘completely constituted’ is that it is that by which there are objects. It is neither tangible nor visible in so far as it is that which sees and touches. The body therefore is not one more among external objects [...]. (p. 105; cf. p. 121, p. 177)

71 Merleau-Ponty uses the French word ‘corps’ throughout. In German, it is possible to express the difference with the distinction between ‘Körper’ and ‘Leib’. No such linguistic contrast is available in French or English. I will use the term ‘living body’ for ‘Leib’, where it is not evident from the context. Otherwise, I will simply use ‘body’. Merleau-Ponty’s understanding of the body is based on, but not the same as Husserl’s. Cf. e.g. Husserl (1991), pp. 161–2, where he states that the body is distinguished essentially from all other things: “‘Einerseits ist der Leib auch ein Ding, physisches Ding wie irgendeines sonst [...]. Es ist ein Ding unter anderen Dingen, zwischen ihnen hat es eine wechselnde Lage, es ruht oder bewegt sich wie andere Dinge. Andererseits ist dieses Ding eben Leib, Träger des Ich; das Ich hat Empfindungen, und diese Empfindungen werden im Leib ,lokalisiert‘ [...].“ (“On the one hand, the body [Leib] is a thing, too, a physical thing as any other. It is a thing amongst other things, it has a changing location among them, it stays or moves as other things do. On the other hand, this thing *is* body [Leib], bearer of the I; the I has sensations, and these sensations are localized on the body [...].”; my translation.) For a comparison between Husserl’s and Merleau-Ponty’s concept of the body cf. Carman (1999).

One might ask whether the distinction that is made here is an ontological one or merely one of perspective (cf. Baldwin and Bell 1988). Jean Paul Sartre made a similar distinction – between the ‘body-for-oneself’ and ‘the body-for-others’ – meant as an ontological distinction where both notions refer to different objects. However, this does not seem to be Merleau-Ponty’s view. It is rather a distinction between two different ways of presentation of the same object. In a footnote he speaks about “two views of me and my body: my body for me and my body for others” (p. 131, fn. 17). This clearly is reminiscent of Sartre’s distinction without following the ontological implications. Hence, what is crucial in his account is the body for me, the living body, as it functions to perceive and act on the world. However, this does not mean that this body is ontologically separate from the body as an object in the world. It is this same body but conceived in its largely prereflective and preconscious functioning that constitutes our way of perceiving and acting. How does Merleau-Ponty cash out this idea?

The body schema

The most important notion in this context is the notion of the ‘body schema’.⁷² This becomes clear at the beginning of the chapter on “The spatiality of one’s body and motility” where Merleau-Ponty contrasts the body and the living body, the latter of which is present in the body schema. The notion of body schema already appeared in the discussion of Gallagher’s account. In Gallagher, the body schema referred to basic preconscious capabilities of bodily movements, such as motor programmes that enable fluent and flexible behaviour. The usage in Merleau-Ponty is slightly different, however.

72 Let me add one important note right at the beginning. As already noted in the discussion of the account of Gallagher there are two kinds of body-related notions that are important and related but have to be sharply distinguished. These are ‘body image’ and ‘body schema’. Merleau-Ponty speaks of “schéma corporel” (e.g. Merleau-Ponty 1945, pp. 114–120). Thus, he intends the latter. He refers to Conrad (1933). Unfortunately, Smith’s edition of Merleau-Ponty’s *Phénoménologie de la perception* does not reflect this difference. He translates “schéma corporel” as “body image”. However, one must admit that the distinction between the two notions then was not the same as it is today. Thus, it is especially important to have a close look at Merleau-Ponty’s understanding of the notion.

Merleau-Ponty takes the body schema neither as a set of associations of different representations of the body, a “name for a great many associations of images” (p. 113; cf. Head and Holmes 1911; Pick 1922; Schilder 1923). Nor does he understand it as a “total awareness of my posture in the inter-sensory world” (p. 114).

On his view, quite similar to Conrad’s (1933), the body schema is a special kind of Gestalt. Being a Gestalt essentially means that it is not an aggregate of particular bits of representations or information but a whole that cannot be reduced to the sum of its parts. Thus, the whole is more basic than the parts (both epistemologically and ontologically). The body schema is a *special* Gestalt in that it is fundamentally determined by actual or possible tasks, it is “dynamic” (Merleau-Ponty 2002, p. 114). Through the body schema the living body is always already oriented towards (possible) goals, is always already engaging with the world. Thus, as Merleau-Ponty puts it, “the body schema is finally just a different word for saying that my body is toward-the-world”⁷³. Furthermore, I know of my limbs and their position through the body schema that encompasses them all (pp. 122–3).⁷⁴

In effect, the body schema has three functions. First, it grounds a special kind of awareness, in which my body is presented to me as a Gestalt. Second, it is the basis of my knowledge of how my body is situated in space, how my limbs are spatially arranged. Third, it is a condition on my ability to interact, to engage with the world, which is expressed in the claim that the body

73 This is my own translation of Merleau-Ponty (1974), p. 126 (Merleau-Ponty 1945, p. 117). Smith translates it as “the body image is finally a way of stating that my body is in-the-world.” (Merleau-Ponty 2002, p. 115). I already mentioned the difference between ‘body image’ and ‘body schema’. Being-in-the-world is a term that is introduced by Heidegger (2010). Merleau-Ponty’s “being-toward-the-world” might be similar but it is in an open question whether one can simply identify both notions. I do not want to discuss this issue here.

74 This is a difference to Gallagher’s account, where knowledge of the positions of the limbs is based on the body image.

schema is just another expression for “*être au monde*” (being-toward-the-world).⁷⁵

However, is there more to be said about the body schema than just stating its functions? What *is* the body schema essentially? To find an answer to that question, it is useful to have a short look at Kant, where schemata play an important role in the explanation of perception (cf. Carman 1999, pp. 218–9). Kant 1998, pp. A137–47/B176–87 tries to answer the difficult question⁷⁶ of how it is possible to apply “pure concepts of the understanding to appearances in general” (p. A138/B177). Recall that for Kant, “[t]houghts without intuitions are empty, intuitions without concepts are blind” (p. A51/B75). Hence, the interplay of concepts and appearances is one of the core ideas in Kant’s philosophy.⁷⁷ Therefore, he needs an account of how both connect, since they belong to fundamentally different realms. Here is the point where the schemata come into play as a “general procedure of the imagination for providing a concept with its image” (pp. A140/B179–80), as the “pure synthesis, in accord with a rule of unity according to concepts in general” (A142/B181). Thus, the schema essentially is a rule or procedure that determines the application of categories to particular appearances or the particular imagination of general categories that is done by the power of judgement.

While Kant thought that the schemata are generated by the faculty of imagination, Merleau-Ponty sees the body schema realised in the habitual engagement of the living body with its environment. Like Kant’s schemata, Merleau-Ponty’s body schema has its place between sensation and mature perception, grounding the applicability of one to the other. The body schema, which is nothing beyond the ability of the habitual but flexible, non-reflective and preconscious engagement with the world that is given with the body, has

75 Tiemersma (1982), p. 253 summarizes these points in stating that the body schema “is a very rich one, incorporating aspects of practical intention, expression and comprehension”.

76 “This schematism of our understanding with regard to appearances and their mere form is a hidden art in the depths of the human soul, whose true operations we can divine from nature and lay unveiled before our eyes only with difficulty” (pp. A141/B180–1).

77 That is why it is no surprise that Kant took the chapter on schematism to be one of the most important of the “Critique of pure reason”; cf. Kant (1998), Editorial notes, p. 728, n. 51.

a similar theoretical position as the schemata in Kant's philosophy have. They are not only similar in their fundamentality in both approaches, but also in their primitiveness: both philosophers argue that more cannot be said about them than stating their functions.

Interim conclusion

Let me take stock and look at what I have said so far about Merleau-Ponty's account. I started with a quote that makes clear that Merleau-Ponty claims that without a body there would be no perceptual space. I then made clear what is meant with the 'body' in this context, namely the 'living body'. I outlined what is distinctive about the living body, which is essentially captured in the various functions of the body schema. Ultimately, and this is an extraordinary claim of Merleau-Ponty's, the body is taken by him as a subject in its own right: "[T]he body is a natural self and, as it were, the subject of perception" (Merleau-Ponty 2002, p. 239). This claim is essentially directed against views such as Kant's which he took to be overly intellectualistic. There is no need for a transcendental ego; the living body does the trick.

These are the cornerstones of the notion of the body as it figures in Merleau-Ponty's account. In what follows, I will turn to the question of how the body constitutes perceptual space.

'Gearing'

Merleau-Ponty's account of how perceptual space is grounded centres on the idea that the living body is always *geared* to the world.⁷⁸ This idea, which is central but difficult to understand, might be spelled out as follows.

I think one can conceive of gearing as another end of explanation, another basic fact that comes with the body schema and cannot be spelled out in any more primitive terms but can only be described. The gearing to the world is an ever-present constituent of human embodied nature. Body schema and

78 In the original, he uses "la prise". The German edition has "Anhalt". One might trace back the notion of gearing to the writings of Heidegger. As in Merleau-Ponty, the notion of gearing is strongly connected with the idea of human being-in-the-world as an *oriented* mode of existence; cf., e.g., Heidegger (1979), p. 319.

gearing to the world are aspects of the being-toward-the-world that human existence essentially consists in. The fact that we are always and constitutively geared to the world is a shorthand for saying that we are always oriented toward the world according to our intentions and bodily needs; that the world, on the other hand, is perceived against the background of practical engagement and structured by it. Indeed, Merleau-Ponty claims that “[w]e remain physically upright not through the mechanism of the skeleton or even through the nervous regulation of muscular tone, but because we are caught up [*nous sommes engagés*] in a world” (Merleau-Ponty 2002, p. 296, n. 18; cf. Merleau-Ponty 1945, p. 294, n. 19).

The idea of gearing essentially means that the world is a kind of handhold for us. This is terminologically present in Merleau-Ponty’s usage of ‘la prise’, which literally means ‘grasp’. It also comes out in the German ‘Anhalt’ that is associated with the idea of something that helps to maintain balance. The English ‘gearing’ is slightly different in meaning, although not inappropriate: the world and the living body engage with each other as cogwheels in a gear-box do; they are highly attuned to each other. This is different from the idea that the world helps to maintain our balance. However, it is in accordance with the body schema and its functions that enable our fluent and flexible engagement with the world, which usually presents itself to us as a space of easy-to-accomplish possibilities ready for us to realise. In that sense, we are attuned with the world, which is well brought out by the term ‘gearing’.⁷⁹

With these rather general considerations about how Merleau-Ponty understands perception, I now turn to the special case of perceptual space and its explanation. It will come out that all elements mentioned before are part of the explanation.

The constitution of perceptual space

The crucial passage for the explanation of the constitution of perceptual space is the beginning of the second chapter of the second part, which is headlined

79 Merleau-Ponty describes the relationship between the bodily activity and perception in terms of figure and ground, too. Originally, the structure of figure and ground means that everything one perceives is always perceived as a figure against a certain background, an idea that was developed by Gestalt psychologists; cf. Merleau-Ponty (2002), p. 4; p. 117.

“Space”. In that section, Merleau-Ponty draws on experiments employing various methods to examine the long-term effects of perceptual distortions. Merleau-Ponty takes these studies to be indispensable for examining the constitution of perceptual space (Merleau-Ponty 2002, p. 284).

He (pp. 285–293) cites experimental results from Stratton (1897), and Wertheimer (1912). Stratton used inverting goggles that make the world appear upside down. According to his report, the initially upside-down turned visual field rights itself after some days. On Merleau-Ponty’s interpretation of the findings, this process comprises effectively three stages. First, the visual image is turned upside down, everything seems unreal. Second, from the second day onwards the world is perceived upright again but now the own body seems to be either turned or in an abnormal position. In the third stage, the body increasingly rights itself, particularly when the subject is active. Notably, successful goal-directed movement is not possible before the fifth day and unseen parts of the body remain experienced in their former spatial position. The correct localization of sounds is not possible until the eighth day and only when the source of the sound is simultaneously seen.

The second study Merleau-Ponty discusses is reported in Wertheimer (1912). In this study, the perception of a room is distorted by a mirror so that the room appears to be tilted 45 degrees off the vertical. When subjects are exposed to this situation (they can only see the mirror image), they see the room initially tilted. However, there is a sudden re-instantiation of a ‘normal’ perception after a few minutes: the room appears straight up again. In this case, the change happens without any preceding active exploration or interaction of the subject with the perceived environment as was necessary in the inverted vision case.

How does Merleau-Ponty interpret these experimental results? In both experiments, there is a conflict elicited between differently oriented sensational fields. In the first case, the conflict holds between synchronously present sensational fields – visual and tactile. In the second case, the conflict is diachronically between two visual fields – the one that was present before subjects looked in the mirror and the one that is present while they are watching the

scene in the mirror. Both conflicts vanish, though after different amounts of time. The crucial question is how the sudden or increasing change of orientation of the visual field is to be explained.

For understanding Merleau-Ponty's answer to this question, the notions of living body, body schema, and gearing that I discussed above are essential. For him, the notion of gearing is crucial: what marks the transition from a perception of a scene as tilted, or disoriented to a perception of an oriented, 'normal' world is the transition from initially not being geared to the new environment to being geared to it. Abnormal perception is based on one's being geared to the world one used to perceive before putting on inverting goggles, or looking in the mirror. That is why the new perception seems strange, and impossible to rely on in acting. However, time or/and habituation lead to a change in that one gets geared to the newly presented environment which in turn 'rights up' perception.

Thus, our 'normal' upright perception is nothing beyond a perceptual correlate of the gearing of the body to the world.

Spatial perception of the environment depends on the way the body is geared to the world. I already explicated that the gearing consists essentially in the way body and world are linked by the body schema. Thus, the way the world appears to us spatially is constituted by the body and its habitual engagement with the environment that is generated beyond our conscious control. Merleau-Ponty articulates this thought in the following way.

There is [...] another subject beneath me, for whom a world exists before I am here, and who marks out my place in it. This captive or natural spirit is my [living] body, not that momentary body which is the instrument of my personal choices and which fastens upon this or that world, but the system of anonymous 'functions' which draw every particular focus into a general project. [...] Space and perception generally represent, at the core of the subject, the fact of his birth, the perpetual contribution of his bodily being, a communication with the world more ancient than thought. (p. 296)

2.2.4.3 Summing up embodiment approaches

Both accounts that I have discussed in this chapter take the body as a constitutive condition of perceptual space. Unfortunately, Gallagher's account lacks

clarity on most important issues. Three lines of thought are mixed up in his account somehow: first, an argument that centres on the physiology of animals in a von Uexküllian fashion; second, an argument to the effect that non-perspectival proprioception constitutes perceptual space; and third, another argument to the effect that ‘prereflective’ functions of the body schema are what explains perceptual space. I tried to make sense of his account in proposing a possible understanding of how these strands of thought can be integrated. However, the argument focussing on the non-perspectival proprioception remains especially unclear (not only with regard to how the argument is supposed to work, but also with regard to its role in the overall argumentation, given the later emphasis on the body schema). In the end, one has to concede that Gallagher’s position has many open ends and it is difficult to see what his arguments really are. In Gallagher’s work, one can find a lot of notions and ideas that are present in Merleau-Ponty’s *Phenomenology of Perception*. I suspect that he wants to defend a similar account of perceptual space as the French phenomenologist.

However, Merleau-Ponty has a clearer way of arguing. The central concepts in his approach are spelled out more carefully. The practical engagement with the world that is marked by the concept of gearing is the central explaining element when it comes to perceptual space. For Merleau-Ponty, this gearing is tied to the living body. He takes the living body as an autonomous subject that has ways of receiving information and acting that are beyond the person’s conscious dealings with the world. Only examining strange situations or pathologies can reveal these fundamental interactive structures on which our personal conscious perception and experience depends. Thus, for Merleau-Ponty, perceptual consciousness is built on the fundamental bodily processes that might be seen as residuals of our phylogenetic development that were already there when consciousness and a ‘personal life’ was not. Surely, in the realm of the person with its consciousness, self-consciousness, rationality and thinking we are able to go beyond these ancient and immediate ways of coping with the world. However, Merleau-Ponty claims that all these sophisticated ways of perceiving, thinking about and acting on the world are

fundamentally and inextricably linked and built on a subject that belongs to us but is largely autonomous: our living body. In particular, one of the crucial conditions for all intellectual operations we are able to perform to pursue our goals in this world, that is perception, is claimed to be constitutively dependent on how our living bodies are situated in and interacting with the world. Thus, Merleau-Ponty's is an account in which the body in its pre-personal interaction with the world constitutes the nature and structure of perceptual space.

2.3 Systematic overview of constitutive accounts II: *Kinaesthesia, potentiality and disposition to act*

In this chapter, I want to consider three positions in which perceptual space is thought to be constitutively dependent upon the dispositions, potentiality or capability to behaviour that subjects have. In contrast to Noë's account, it is not some knowledge about sensory consequences of (self-)movement that grounds perceptual space. Instead, similar to the embodiment approaches I discussed before, it is claimed that perceptual space constitutively depends on the practical possibilities the perceiving subjects have.

The idea is cashed out in different ways by these thinkers. Husserl's central thought is that the whole system of own practical possibilities constitutes spatial perception. In Scheler's account, the grasped potentiality to self-induced movement constitutes perceptual space. Evans claims that dispositions to behaviour partly constitute the egocentric spatial contents of perception.

However, there is also an important difference to the embodiment approaches. Whereas in the former accounts claims about the living body and its engagement with the world figure centrally in the explanation of perceptual space, the positions of the late Husserl, Scheler, and Evans are not dependent on claims about embodiment. On these accounts, only dispositions to behaviour matter for an explanation. These authors seem to think that the fact that

the practical dispositions are realized as bodily processes does not add something substantial to the explanation of the nature of perceptual space. They might be realized otherwise.

My discussion of these approaches will be structured as follows. The accounts are introduced with respect to the core claims about how dispositions to action are taken as a constitutive condition on perceptual space. A second aim is to show their independence from claims about embodiment. None of the three positions treats this question explicitly. Nevertheless, any of these accounts contains some thoughts that make it plausible that what essentially explains perceptual space is something that is not tied to an embodied nature of the subject. Therefore, the body seems dispensable in the explanation of perceptual space.⁸⁰

2.3.1 Late Edmund Husserl

Husserl's account is centred on the concept of *kinaesthesia*. This is true for every stage of his philosophical thinking. However, as already indicated, only the term stays the same while its meaning changes significantly. I already presented some steps of the development of this notion in Husserl's thinking (see sections 2.1.1 and 2.2.2 above). Here, I will now only explicate his understanding in the last period of his philosophy.

In his later work, Husserl distinguishes between two different functions or roles that *kinaestheses* have. On the one hand, the term refers to the actual movements we perform. Viewed in this regard, they are termed "practical functioning" ("praktisch fungierend"). On the other hand, they are "perceptual functioning" ("wahrnehmend fungierend") in which role they are constitutive of perceptual space (Husserl 2008a, pp. 396–7). He does not claim that

80 I discuss the implications on embodiment mainly to mark the substantial difference to the accounts discussed in the previous chapter. I do not want to claim that we can or should abandon any claims about embodied processes in a theory of perceptual space. Nevertheless, it is a mark of these theories that they try to formulate their views in ways that abstract from bodily processes.

the set of *kinaestheses* is divided into two different kinds but only that they serve two fundamental different functions.

All *kinaestheses* together form a system of possibilities (“Vermöglichkeiten”; Husserl 1954, p. 164, cited in Ferencz-Flatz 2014, p. 38).⁸¹ Thus, *kinaesthesia* does not only mean sensation of movement or actual movement anymore but it refers to the whole set of possible movements. Husserl claims that this diachronic manifold of practical possibilities constitutes perceptual space (Neumann 1999, pp. 159–60; Claesges 1964, p. 73, p. 82).

Although it is true that Husserl conceives of *kinaesthesia* primarily as the system of possible *bodily* movements, one might wonder whether the body is not dispensable, since the kinaesthetic system is just a set of *possibilities*. Furthermore, in his later thinking, Husserl takes the kinaesthetic system not as the set of possible *overt bodily* movements. Instead, the kinaesthetic system consists of movements that belong to the inner perspective one has of the own body (Ferencz-Flatz 2014, p. 39; Husserl 1954, p. 164). He speaks of “inner mobility” (“innere Beweglichkeit”) in contrast to the outer observable physical movements (Ferencz-Flatz 2014, p. 39). Although the inner movements correlate with observable bodily movements they are not reducible to them. Furthermore, they are also not just complexes of sensations. It is not entirely clear what these inner movements really are. It seems that he refers to the movements as experienced from the inside.

Given these claims, it is no big step to dispense with claims about the body altogether. Indeed, Husserl considers this possibility in stating that he sees no reason why being an embodied organism should be necessary for the existence of *kinaesthesia*.

Aber denkbar ist es, dass ich gar keinen Leib habe, dass eine Natur ohne einen Leib sich durch Kinästhesen, Nah- und Fernkinästhesen, konstituiert. Ich kann

81 Cf. the statement from Husserl quoted in Ferencz-Flatz (2014), p. 36: “*Kinaesthesia* differs from *Empfindung* (sensation) by having an intimate relation to subjective potentiality” (originally in Cairns 1976, p. 4).

nicht einsehen, warum das nicht möglich sein soll. [...] Es könnte sich doch rein kinästhetisch das Null konstituieren.⁸² (Husserl 1973, p. 547)

By taking *kinaestheses* as bare possibilities, it is now possible for him to consider that it might be possible that the nil, which is the centre of perceptual space, might be constituted by *kinaesthesia* alone, without presuming a body; that is, space literally becomes a synonym for the set of possibilities one has.⁸³

I want to close my discussion of Husserl's later account with these considerations. To get a comprehensive view of his thought is notoriously quite difficult since his thoughts are contained in thousands of pages of manuscripts, a lot of which are not published yet. However, I think it is justified to say that Husserl's account of the constitution of perceptual space draws on the practical possibilities we experience from the inside and that it allows for the claim that a constitutive explanation of perceptual space does not need to rely on claims about the embodied nature of the perceiving subject.

2.3.2 Max Scheler

Max Scheler's account is primarily articulated in his essay "Idealismus – Realismus" (1928)⁸⁴. Here is the baseline of his explanation of space in few sentences, to get an overview of what will be discussed in more detail below. On Scheler's account, spatiality is constituted solely by the grasped power to self-induced movement. A particular space is a special kind of spatiality that is tied

82 „However, it is conceivable that I do not have a living body, that a nature can be constituted by *kinaestheses*, near and distal *kinaestheses*. I cannot see why this should not be possible. [...] The nil might be constituted purely *kinaesthetic*“ (my translation).

83 Peacocke (2014) has also recently developed the idea that the basic entities that can be regarded as subjects, i.e. those that employ his Degree 0 and 1 of self-representation, can be explicated without taking into account notions of embodiment. He describes the experience of a subject with Degree 0 of self-representation as having a centre, a here, without thereby being a form of self-representation since there is no element in the content that refers to the subject itself. The 'here' is just a location (p. 31). This shows at least that the question whether subjectivity is essentially embodied is still debated in contemporary philosophy.

84 An English version is to be found in Scheler (1973). Some other claims related to the topic are present in Scheler (1960) and Scheler (1976) (English: Scheler 2009).

to the kind of organism. The most important feature of human perceptual space is emptiness. Emptiness is constituted by an excess of unsatisfied drives over satisfied ones, something that is in turn a constitutive element of human nature (or, more precisely, mindful creatures in general).

These sentences state only the cornerstones of Scheler's account. I will now explicate some details and relations of these cornerstones.

Scheler does not start his discussion in "Idealism – Realism" with space as it is present for us in perception. Rather, he starts on a more fundamental level with what any kind of space has in common: spatiality. Spatiality is just the bare synchronous being-apart. Spatiality is in effect what makes it possible to distinguish between qualitative identical entities.

Spatiality is grounded in the experienced power to spontaneous movement:

The central experience [of spatiality] is originally only a creature's experience of his ability to produce certain spontaneous movements. Spatiality is acquired through activity [*erspielt*] before it is represented and thought. (Scheler 1973, p. 330)⁸⁵

In characterizing the movement in question as spontaneous, he highlights that the factual movement that actually happens is not so much of explanatory value as the idea of spontaneity of activity. For Scheler, spontaneity is tightly linked to the idea of a living being: the capability to induce some change to one's state and thereby to elicit another state.⁸⁶

Hence, the first important claim of Scheler's is that spatiality is constituted by this grasped power to move. Spatiality is thus tight to living beings and every living being that is capable of movement and has this basic grasp of his

85 "Das Kernerlebnis ist ursprünglich nur die erlebte *Möglichkeit* oder besser gesagt das *Könnenserlebnis eines Lebewesens*, gewisse *Bewegungen spontan* hervorzubringen. Räumlichkeit wird *erspielt*, *ebe* sie vorgestellt und gedacht wird" (Scheler 1928, p. 296).

86 On Scheler's view, the relevant movement is just a special sort of something more fundamental that all living beings share. This is change. He takes change to lie beyond the distinction of alteration and movement. The latter are special kinds of the former. Alteration (as reversible change) constitutes time, movement (as non-reversible change) constitutes space. For Scheler, time is more fundamental than space. Life is originally a process in time; it spatializes itself; cf. Scheler (1928), pp. 303–4; Scheler (1973), p. 337.

capabilities is thereby capable of experiencing some form of spatiality. Scheler's use of 'experience' ('Erlebnis') of own abilities is certainly not meant in the usual sense as some high-level conscious experience of what one is able to do. I think it is rather meant as some basic grasp of what movements are possible, something that children and animals need to act purposefully.⁸⁷

Scheler claims that every special kind of space, such as our space conceived of as unitary, continuous, three-dimensional, homogenous and unlimited, is relative to the kind of organism (Scheler 1960, p. 303). Accordingly, Scheler explains the properties of space with reference to properties of humans, in particular properties of the movements that humans are capable of (Scheler 1928, pp. 304–5; Scheler 1973, pp. 337–8). All properties of 'our space' are marked as being grounded in properties of the ways we are able to move. Therefore, his statement that "the one subjectively given space is only the sum total of our possibilities of spontaneous movement"⁸⁸ (p. 339) has to be taken literally.

One distinctive property of space Scheler explains with reference to something that he takes to be essential to human nature. He claims that only humans (and supposedly sufficiently similar beings, i.e. mindful beings) perceive their space as being void (Scheler 1976, pp. 31–8; Scheler 2009, pp. 26–33). For him, this fact is of "greatest interest" (Scheler 1973, p. 331; Scheler 1928, p. 297). We conceive of space as a substantial emptiness filled with objects. We have the strongest intuition that space does not change when all objects are changed and that it would still be there even if all objects would vanish. Thus, we conceive of the literal non-existent to be more fundamental than the things that properly exist.

This oddity is grounded, according to Scheler, in a constituent of human nature. Humans are creatures where the unsatisfied drives are in excess of the satisfied ones. Humans constantly hold back their instinct or drives and do not satisfy them (Scheler 1928, p. 303; Scheler 1973, p. 336). They do not

87 To catch some prey an animal needs to have some grasp of how it can move, e.g. in which directions it can turn, how far it can reach out or jump etc.

88 "Unsere subjektive Raumgegebenheit [ist] primär nur der Inbegriff unserer spontanen Bewegungsmöglichkeit" (Scheler 1928, p. 306).

blindly follow their instincts but constantly suppress at least part of them. This comes with our being mindful creatures. As Scheler contends, having a mind frees us from the instincts that are related to the living beings that we are, too. Having a mind marks the difference between mere living beings, whose behaviour and perception is dependent on its instincts, and human beings that are able to transcend this sphere. Humans have a world while mere living beings just have an 'Umwelt', as Scheler states, using a central concept from von Uexküll (Scheler 1976, p. 32; Scheler 2009, p. 27). Humans are open to the world. However, humans also still have instincts and these create expectations of what satisfaction of them would mean; but they are never fully satisfied. These unfulfilled expectations ground the phenomenon of the void (Scheler 1928, p. 302; Scheler 1973, p. 335). Other beings that do not have this constant excess of unsatisfied instincts do not experience their space as empty accordingly.

To sum up Scheler's view about the nature of perceptual spatial experience, his account rests on two central claims. First, he claims that spatiality is constituted by the grasped power to self-movement. This surely is the most important claim for my discussion since it formulates the central thesis that action is constitutive of spatial perception. However, it is difficult to pin down a detailed understanding of this point. In particular, it is far from clear what he means by the 'grasped power to self-movement' and, especially, how one should conceive of this grasp. I already said that it is supposedly a low-level mental state representing basic practical capabilities of the subject. The only thing that is clearly indicated by this description is that Scheler's account does not centre on the mere presence of the subject's capabilities (as, e.g. Evans's account does, as we will see) but on some grasp of these capabilities.⁸⁹

The second central claim within Scheler's approach is that the distinctive human perceptual space is further grounded in distinctively human properties. The dimensions of perceptual space are grounded in his ways to move and

89 After having discussed the empirical evidence that speaks in favour of the constitutive views and having argued that on the face of this the capability approaches seem most promising as accounts of perceptual space, I will come back to the question in Ch. 9 of how to develop Scheler's starting points of an account into a comprehensive position.

the fact that we conceive of space as void is explained by a constant excess of unsatisfied instincts over satisfied ones that grounds the void. I think the first of these claims is part of many of the accounts that take action as a constitutive condition on perception. However, the last one is probably the most speculative and queer sounding of the account. I will not elaborate on it further. Note that it already concerns a higher level of representing space than perceiving it. Spatial perception is not necessarily tied to perceiving space as void. It is only tied to perceiving things in a particular distance and directions.

Let me turn towards the question of why Scheler's account might not imply any commitments to embodiment of the perceiving subjects. First, one might again consider the possibility of a bodiless subject and ask whether on Scheler's account it is conceivable that such a creature enjoys spatial experience. I think the situation here is basically the same as in the case of Husserl's account: since space is constituted by the grasped power to self-movement, that is, as we said before with regard to Husserl, by the pure 'I can', no body seems necessary. Hence, if something like a pure *res cogitans* is possible in general, it is also, on this account, likely that it is able to perceive spatially, given it has some grasp of its possibilities to move. In effect, the only thing that is presupposed in Scheler's explanation is a living being, i.e. a being that is able to move actively.

No other conditions need to be satisfied. In particular, the creature does not even need to have means of collecting sensory information. For Scheler, spatiality is constituted independently of and before any sensational information comes in. He adopts a view here that was developed by Erich Jaensch who claimed in his Eidetic Theory that all visual experiences, be it perceptions or imaginations, are dependent on more fundamental eidetic images. Scheler takes this claim as support for his view that spatial experience is constituted by nothing beyond the grasped power to initiate self-movement (Scheler 1928, p. 295; Scheler 1973, p. 329). One might even suppose that what ultimately grounds spatiality in Scheler's account is just the grasp of one's possibilities to move. That is, it is not even necessary that the creature is actually able to move, it just has to have some grasp of himself as having the power to move.

Given that, Scheler's position would be an extreme case of a theory that posits action as a constitutive condition on spatial perception: it is not actual action, it is not past action, it is not actual possibilities of the subject to act but only the possibilities to act that the subject grasps himself to have.

Although these considerations about bodiless beings are clearly just metaphysical speculations, they help to clarify what Scheler's explanation essentially relies on: a being that can grasp himself to have some possibilities to move. Since this is not necessarily connected to the claim about embodied creatures, the explanation does not hinge on any statements about the body.

2.3.3 Gareth Evans

In turning to the position of Gareth Evans, we enter terrain that is more familiar again. The main textual basis is to be found in Evans's incomplete work *The Varieties of Reference* (1982), in particular the sixth chapter about demonstrative identification. Evans holds that demonstrative reference is only possible under two conditions. The first is that there has to be an 'information-link' (e.g. perception) between object and subject; the second is that the subject has to be able to locate the object in space, based on this information-link. (The account is in effect an extension of Peter Strawson's position, in which only the first claim is made; cf. Evans 1982, p. 143.)

In the course of spelling out the details of the second condition, Evans reflects on forms of spatial representation. For him, three conditions have to be satisfied for a given organism to enjoy perceptual space. The first is perceptual input, the second is that this input is directly linked to dispositions to behaviour, and the third is that the organism is capable of conceptual thought.

The last one is a general condition on the possibility of conscious experience on Evans's view. I will not elaborate on this claim but only note that Evans's idea is not that one needs a concept of left and right, e.g., to be able to have conscious experience of space. The connection is more loose in that the subject is supposed to have some thoughts whose (conceptual) content is determined by the contents of his non-conceptual perception. That is, only

those contents of perception become conscious that possibly determine the content of (some of) our thoughts.

Evans' first condition on perceptual space is that there is some input from the world to the perceiving subject. Evans calls this 'information' or 'input'. In effect, this is the sensory stimulation that we receive via our sensory systems. Evans claims that the bare proximal stimulation that is caused by the environment is not sufficient for the subject to have spatial experience. Take sound for example. Sound waves, if not approaching from straight ahead, reach the ears with some small difference in time. The waves first hit the ear that is nearer to the source of the sound (interaural time difference). Furthermore, the head in lying between the source of the sound and the second ear shadows the second ear, which leads to a difference in the level of the sound (interaural level difference). These two kinds of differences are important for the lateral discrimination of the direction of sound (left, right, ahead). Others are involved in the remaining directions. The claim that is effectively denied by Evans is that the registration of these differences in the stimulation of our auditory systems alone are already sufficient to elicit spatial sensations (something that arguably holds similar for any sense modality).⁹⁰

That is the point where the second condition comes in. Evans asks the reader to imagine a creature that is able to discriminate between distinctive patterns of proximal stimulation. If one would ask such a creature to respond differently when the left ear first receives a sound or when the right ear first receives a sound, respectively, it would be able to give the right answer. Thus, the organism is able to respond according to interaural differences in time and level of the sound. However, Evans claims that this does not mean *per se* that the creature grasps the direction from which the sound is coming. He claims that only when these patterns of proximal stimulation are directly linked to dispositions to behaviour does the creature experience the sound as having spatial content. Thus, proximal stimulation patterns, although they may vary systematically with spatial content (e.g., a certain interaural time difference correlates to a certain direction of sound), are not in themselves sufficient to

90 He refers to Bower (1974), Rock (1985), Pitcher (1971), and Taylor (1978).

constitute spatial content. Only adding the direct links to action to the picture can explain why we perceive the environment as spatially structured.

Against this line of thought, one might argue that the envisaged creature would indeed be able to know the direction from which the sounds come. One only has to assume that the creature has some background knowledge about the systematic relationship between interaural time and level differences and spatial direction of sounds. That is to say that it could, in principle, calculate the direction of a particular sound, given that he knows the actual values of the relevant differences and some equation that specifies the relation between the pattern of differences and the angle of the approaching sound.

Evans's answer to this objection could be that it is unlikely to be applied to the human case. Given that it is true, it would follow that it is possible that two people hearing a sound from the same direction could react differently when they would be asked, e.g., to orient towards the sound. This is due to the possibility that there are mistakes or simply differences in their calculations. Since this never happens (or so claims Evans), we have good reason to suppose that the spatial content is not the result of some calculation that grounds our reaction. Rather, it is more likely that it is the other way around; the dispositions to behaviour are immediately linked to the input pattern of proximal stimulation, and are thus co-constitutive of spatial experience. Therefore, individual differences are ruled out; since a given location is constitutively dependent on some disposition to behaviour, two people experiencing a sound as coming from the same direction cannot but react the same way, since the disposition to exactly this reaction itself constitutes the kind of spatial experience they share.

Now, one might again argue against this that individual differences in reaction to sound are not common because the calculations are not that complex or they are hard-wired into our cognitive machinery. This would be an alternative explanation of the absence of differences in reactive behaviour. Another way to argue against Evans would be to say that it is not obvious that there are no such differences; maybe they are quite small and difficult to measure so that they are not observable in daily life. Evans simply assumes

that there are no such differences in behavioural reactions, but he does not show that this is actually true.

However, this point can be answered as well. It seems to me that Evans's point here is not to make an inductive inference from the observation that there are no behavioural differences to the general claim that dispositions to behaviour are constitutive of spatial perception. That would be an unwarranted move. It is rather that the absence of behavioural differences follows from his account easily. Therefore, one should read it more like something to raise the plausibility of the account. I think Evans's fundamental point is that it is in principle impossible to get auditory spatial perception from the registration of interaural time and level differences alone. One could imagine a creature that does this registering for a hundred million years; it would at most end up with a plethora of possible time and level differences and maybe with knowledge about some systematic relations between them. However, it could never be able to assign these differences some spatial meaning (Grush 2007, p. 406). How should it? It just registers that there are these differences in the stimulation of its ears. Before, I said it would be possible for such a creature to calculate the direction if it had enough knowledge about correlations between the values of the interaural differences and differences in direction of sound. However, the exact question is how the creature should ever know about these correlations by only being able to register the differences. This is the point where the dispositions to act come in. The sounds do have to be directly and systematically linked to dispositions to behaviour. These dispositions are in fact what one might regard as a way of knowing the correlations. The correlations between interaural differences and direction of sound are somehow present in these dispositions. The dispositions that are connected with particular proximal stimulation patterns therefore are what bridges the gap between values of interaural differences and genuine spatial sensation. Thus, "only agents are perceivers" (Schellenberg 2007, p. 603).⁹¹

91 Peacocke (1983), Ch. 3 develops an account of spatial representation that is inspired by and an extension of Evans's approach. On Peacocke's account, spatial representation is constituted by links between behaviour and sensation. He argues that not just any input-

Now, let me turn to the question of how Evans's position differs from the embodiment approaches I discussed in the preceding chapter. One of the properties of perceptual space is that it is organized around a centre. Usually the centre of my perceptual space is where I am, that is, where my body is. I perceive things as being located in relation to the position of my body. This is natural on Evans's picture since I perceive with my bodily sensory systems and the behaviour, the dispositions to which are linked to the proximal stimulation, is usually bodily behaviour. Thus, I do not only perceive from where my body is but I also act from where my body is. The body seems to be the natural centre around which perceptual space is structured. What I regard as left and right is actually defined in relation to the position of my body, and it changes with this position potentially. Hence, it seems clear that my body is also partly constitutive of the meaningful structure of my perceptual space. The body defines the place we would call 'here'.

However, we find a possible scenario in Evans's work where it is not necessarily the case that the centre of egocentric space is defined by where my body actually is. In order to reveal a detailed understanding of how 'here'-thoughts work, Evans considers a case in which someone remotely controls a submarine from a vessel on the surface of the sea (Evans 1982, pp. 165–7). The submarine is equipped with cameras, excavators, 'limbs' and propulsion mechanisms that are controlled by the subject. The subject is highly trained in controlling the submarine. Since he sees nothing other than the pictures delivered by the cameras, has no other perception about what is going on in the vessel and is able to fluently 'act' with the submarine, Evans regards it as

output connection is sufficient for constituting spatial contents. For example, mere stimulus-response connections are not enough, since they are in principle present below the level of content. Furthermore, Peacocke emphasizes that a representation of just one place is not possible and that every individual capable of spatial representation must at least be capable of representing two places. This means that spatial representation necessarily implies some kind of mental map of the represented places. Thus, Peacocke refines the relevant notion behaviour that is taken as constitutive and he puts stronger conditions on representing egocentric space. Apart from these distinguishing features, Peacocke's account can be grouped with the capability approaches. Finally, one issue with Peacocke's account is that he shifts between giving conditions on spatial representation and conditions on the applicability of spatial representations. Arguably, both do not have to coincide.

possible that the subject may become so immersed into the scenery at the sea bed, that he finally regards himself to be at the place where the submarine actually is. In this case he would be able to think of the objects he perceives at the ground of the sea as ‘this X’ just like we normally refer to things and places in our environment demonstratively. This would also mean that his ‘here’ thoughts refer to the place where the submarine is and not where the body of the subject is, namely in the vessel at the surface.

One might object to this scenario that there will always be some awareness on the side of the subject of the fact that it is not really situated at the ground of the sea, that it only pretends to be there. The situation is too strange. In addition, it is likely that there are time lapses between reactions of the subject and movements of the submarine etc. However, it seems to me that this scenario is actually possible. A similar and perhaps more intuitively appealing one would be someone playing a video game, in particular, one of that kind where one perceives and interacts with the environment from a first-person perspective. It seems very likely to suppose that after playing some time and being really used to the controls and everything it is possible that one gets so immersed in the game that you not only would refer to the things you see there the same way as when you refer to things in the real world. Furthermore, everything you perceive you would perceive in relation to the place in the virtual environment. That means that you would locate e.g. sounds you hear that are in the real world in the virtual world. You would turn your virtual avatar, not yourself, in reacting to a sound. To refer to the actual sound in your real environment you would then have to think of the sound as ‘coming from my living room’, i.e. you would not refer demonstratively to the sound in the usual simple way.

If such cases are possible, something that is very likely in my impression, it is also possible that the centre of my egocentric space, the ‘here’ is dissociated from the place where my body actually is. In that sense, Evans’s theory does not rely on claims about the body. Instead it allows that the centre of egocentric space is not defined by the (position of) the body but by the ‘origin of the movements that one is disposed to’. The reason why it seems initially

that the body determines the centre would then just be contingent on the fact that in normal circumstances our body is exactly there where this ‘point of origin of our actions’ is.

The general idea might be expressed by stating that the centre of egocentric space is not where your body is but where you conceive yourself to be. This in turn depends on the practical possibilities you conceive of yourself as having to change and interact with what you perceive. It is true that, in one sense, in the described scenarios, you act by e.g. pressing some buttons with your actual body. However, if you conceive of your possibilities as possibilities of pressing buttons in a certain way, you are not really immersed in the situation. Thus, someone who would object to the presented view in saying that the dispositions you have are really only dispositions to press buttons, would deny the conceivability of the scenario altogether. However, part of the scenarios is that the button pressing is not noticed in any way anymore. It becomes just another step in the control of behaviour as the steps that are beyond your awareness in the usual case, like bodily processes that make up your movements. Instead, given the scenario, you would describe your possibilities as turning this or that way or moving left or ahead, thereby expressing possibilities you have in being at the seabed or in the virtual environment. Space is centred on where you act not where you really are on Evans’s account.

2.3.4 Summary of capability accounts

The presentation of the three accounts has revealed that all of them share the basic conviction that the capability to act is essential for an explanation of spatial experience. However, there are differences in the way this idea is cashed out. Husserl’s account is a bit difficult to spell out due to the unsystematic presentation. However, I think, it is in some sense more akin to Evans’s than to Scheler’s. He emphasizes the possibilities that the subject actually has and that the centre of the perceptual space is defined by these possibilities. If my interpretation of Evans’s view is apt, these two claims are also part of his account. In contrast, Scheler’s account crucially differs with respect to the other two in that he sees some basic sense or grasp of one’s

own practical possibilities as constitutive. The mere presence of the latter is not enough according to him.

I also made clear in what sense these accounts differ from the embodiment approaches I presented before. I see in each account hints to the effect that the sense in which action is constitutive for them does not depend on claims about embodiment. They may well be compatible with such accounts but, importantly, the claims made here are independent of any prior commitments about the embodied nature of subjects. This is what distinguishes them from the other group of accounts, exemplified by Gallagher and Merleau-Ponty above.

2.3.5 Summary of systematic overview

In the last two Chapters, I have presented the details of four kinds of accounts claiming that action is a constitutive condition on spatial perception. Each of the accounts takes a different dimension of action to be the crucial. Hurley's explanation operates largely on the level of sub-personal processing and the proposed mutual relationships between mechanisms that subserve perception and mechanisms that subserve action. Her basic distinctions, especially the one between instrumental and non-instrumental dependence are illuminating and helped to structure the extent accounts. However, I also argued that her account lacks the generality that is needed for my general argument to the effect that egocentric spatial perception is a kind of self-representation, a generality that is endorsed by the remaining accounts. Some more problems regarding Hurley's account will come up in section 3.1.2, where empirical evidence will be discussed in light of her view.

Alva Noë's approach puts the emphasis on a distinctive kind of practical knowledge. Unfortunately, the exact shape of his account remains somewhat unclear due to the difficulties with interpreting his writings. What seems to be clear, though, is that sensorimotor knowledge, the crucial element in his account, is gathered by self-induced movements. Thus, he claims a rather indirect connection between action and spatial perception compared to the other

accounts. In the next chapter, I will present empirical evidence that speaks against the sensorimotor view (see section 3.1.3 and 3.1.4 below).

The remaining approaches give an account of spatial perception in terms of the capability to act. I distinguished two sub-groups of these accounts depending on the importance that notions associated with embodiment play in the accounts. Shaun Gallagher's and Maurice Merleau-Ponty's views are explicitly formulated in terms of the basic automatic interactions that we are capable of by being the embodied creatures that we are. We saw that Gallagher's account is particularly hard to understand. In Merleau-Ponty's writings, there are also some notions, e.g. 'gearing', that remain unclear to a certain extent. A common mark of these approaches is a certain anti-intellectualistic attitude towards perception: everything necessary for spatial perception to be present is already there in the supposedly phylogenetically ancient low-level bodily systems that enable the organism to cope with the world.

This attitude stands in a quite sharp contrast to a basic tenet of Max Scheler's approach. Although, on his account, perceptual space also is tied to some very basic capability, namely to a grasp of one's own action possibilities, some features of perceptual space are explained by distinctive human properties like the constant excess of unsatisfied drives that constitutes the void. The fact that it is a basic sense about what is possible for one and not the mere presence of these possibilities that constitutes spatial experience highlights a more sophisticated structure than is supposed by Gallagher or Merleau-Ponty.

Finally, I outlined Gareth Evans's account as the one that is present in the background of many rather recent discussions of the issue (e.g. Campbell 1993; 1994; Schellenberg 2007; Grush 2000; 2007; Briscoe 2009). I outlined his basic idea that informational input has to be directly linked to dispositions to act to have any spatial significance for the subject. His approach does not rely on some basic grasp or sense of one's practical possibilities as Scheler's does, which is the crucial difference between the two.

In the following chapter, I will discuss different kinds of empirical evidence that are relevant to the topic. This shall not only further add to the

substance of the claim that action is a constitutive condition on spatial perception; it shall also help to decide which of the accounts is most appropriate. All kinds of approaches will feature again in the discussion in some way.

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