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Dissertation

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Seeing, Blindness and Illusion.
A Defense of the Content View in Perception.

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Content

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Introduction

The view that perception is a form of mental representation is widely shared in the philosophy of mind. This view can be called an intentionalism about perception. Perception represents something and has an intentional content. Mental representations can be true or false, they can be accurate or in inaccurate. If intentionalism about perception is true, then perception can be accurate or inaccurate, can deceive us or accurately represent external things and properties. In that case perceptual states have a content which can be satisfied by external conditions. It has been widely discussed what the content of perception may be. Is it a conceptual or a non-conceptual content; is it a propositional or non-propositional content? If it is propositional, what kind of proposition can specify the content of perception?

But recently a deeper conflict appeared in the philosophy of perception, namely whether perception is a form of mental representation at all, whether it has content at all. Relationalism claims that perception is a direct relation to external objects and properties and that it involves no relation to a content. As such a direct relation, perception can neither be accurate nor inaccurate. The relation can just obtain or not obtain. Relationalists reject intentionalism about perceptual states. Furthermore they claim that it has been accepted and presupposed without much argument that perceptual states are mental representations. Due to this controversy between intentionalism and relationalism, the discussion on the content of perception has increasingly shifted from the question about the nature of perceptual content to the question about the reasons there are to suppose that perception has content.

The central problem in the present dissertation will be this question whether perception has content. It will examine the arguments relationalists present for rejecting the representational view of perception, i.e. the content view. The position defended here will be that the arguments against intentionalism, against the content view about perception, are insufficient. They do not show that perceptions are not mental representations. They are insufficient to reject the content view about perception.

The aim of the book is therefore to defend and develop a coherent theory of perceptual content. Representations are defined by the feature that they can be true or false, accurate or inaccurate under certain conditions. They have content and it is their content which gives the accuracy conditions (or truth conditions) of the representation. A representation is accurate if the world satisfies the conditions fixed by their content. I will evaluate the arguments for and against intentionalism, the position that perceptual states are such representations having accuracy conditions.

The central argument for intentionalism is the fact that representations imply the

possibility of error. Representation implies the possibility of misrepresentation. Erroneous perceptual representation seems to be necessary to account for perceptual illusions, i.e. perceptual experiences of objects which seem to deceive us about the actual properties of the object we see. For relationalism, perceptual experience is a relation to the seen object and its properties. We can see an object we are related to or we can fail to see it because we fail to be related to it. But we cannot represent *falsely*. Relationalism permits only to account for seeing and not seeing, seeing and blindness. In cases of blindness, we do not see an object or a certain property of the object. We fail to stand in a relation to that object or property, but we do not falsely represent that object. But relationalism cannot use false representations to account for illusions. Relationalism will therefore treat usual cases of illusion as cases where we fail to see because we are not appropriately related to an object or its properties. It will reduce cases of illusion to cases of not seeing, cases of blindness.

A central argument against relationalism and for intentionalism will be that we need the concept of perceptual representation and of erroneous representation to account for illusions. In cases of failures to see, we need to distinguish blindness and illusion, not seeing and seeing falsely. But only intentionalism can make such a distinction and relationalism cannot due to its lack of a concept of misrepresentation and inaccurate content. In the following chapters I will carefully distinguish between cases of seeing, not seeing and seeing falsely, i. e. seeing, blindness and illusion, in order to account for the diversity of our perceptual experience. Intentionalism and relationalism will be evaluated for their capacity to account for this diversity of our perceptual experience. The following arguments in this book are not restricted to *visual* experience, but apply to perception in general, therefore also to hearing, deafness and auditory illusion and the other sensory modalities.[1]

After a first mainly introductory chapter explaining the notion of perceptual representation, the book divides in two parts. A first part (chapter 2 and 3) evaluates and criticizes the arguments presented against the notion of perceptual representation. Chapter two evaluates Alva Noë´s enactivism, a position which is skeptical against the classical view of perceptual representation, but which does not per se reject the notion of perceptual content. Chapter three evaluates relationalism, a position which rejects that perception is representational and has content. This first part is conceived as the critical part of the book in the sense that it presents arguments against the discussed positions, enactivism and relationalism.

[1] The title "Seeing, Blindness and illusion" seems to restrict the argument of the dissertation to *visual* perception. This is not intended. Unfortunately there is no general word for not-perceiving (blindness, deafness etc.) applicable to all perceptual modalities, therefore I used in the title only terms referring to vision.

A second part of the book (chapter 4 and 5) is constructive in the sense that it presents a theory of perceptual representation and of perceptual content which avoids the relationalist objections. One chapter (chapter 4) develops the criteria which permit to attribute content to perceptual states and one chapter (chapter 5) develops a theory of propositional content for perception, a theory of the specific components of perceptual content. The five chapters of the present book propose a positive reconstruction of a representational, or intentional, theory of perception, given the objections of relationalism and some other skeptical arguments against the intentionality of perception. I give a brief overview of the content of these chapters.

Chapter one is mainly introductory and expository of the notion of perceptual representation as it was developed in the representational theory of the mind and as it was applied to perception. The chapter gives a definition of perception and perceptual states and then characterizes the notion of representation as it was developed in the philosophy of mind in the last forty years. Representation is defined here as a state which has intentionality. It is shown how that concept of representation was applied to perception and compares that view of perception to the theories in perceptual psychology which also use “representations” as explanatory concepts. The chapter shows the similarities of the psychological use of “representation” with the notion developed in philosophy, but emphasizes also some differences. And the main challenges for the representational view of perception are briefly described.

The second chapter discusses the view of perceptual content developed in Noë´s enactivism. Noë ultimately rejects the intentionality of perception, but his enactivism per se is compatible with the intentionality of perception. The chapter focuses on the argument that perceptual content depends on sensorimotor activity and knowledge and the thesis that we are “blind” without these sensorimotor components. So, the chapter focuses on Noë’s description of “experiential blindness” as the central evidence for enactivism. I show in that chapter that there is no evidence for such a dependency of perceptual content on sensorimotor knowledge and that the evidence Noë provides for enactivism, namely the phenomenon of “experiential blindness” is unable to support his point about enactivism. It is unable to show that we are “blind” and have no perceptual content without sensorimotor knowledge.

The third chapter addresses the central arguments against the intentionality of perception developed by relationalism. It analyzes the central conflict between intentionalism and relationalism about perception. The main focus is laid here on the account of illusion given by relationalists. As for relationalists perception has no intentionality, it cannot falsely represent and does not have a content which fails to be satisfied by external condition.

Illusions must either be explained by a failure to see which does not involve error, a form of not-seeing (or blindness) instead of a false representation, or it must be explained by erroneous beliefs, i.e. intentional states which are not perceptual. I will show that some, but not all cases of illusions can be reduced to blindness (not-seeing without seeing falsely). To differentiate these two failures to see, blindness and illusion, the distinction between the accuracy and the acuity of perception is introduced. Illusion is characterized by a lack of accuracy, blindness by either an absence of perceptual representation or a lack of acuity. The chapter emphasizes also the difficulty to reduce illusions to false beliefs.

The chapters 4 and 5 are closely connected. They present a theory of perceptual representation which is able to avoid the objections of relationalism and the skepticism about intentionalism. One chapter discusses the criteria we have to attribute content in the case of perception; the other specifies the nature of that content and the specific components of perceptual content. Chapter four discusses the naturalistic theories of intentionality and argues for a causal and functional (teleosemantic) account of the content of perceptual states. Some problems of the existing versions of teleosemantics are discussed and the chapter proposes a version of a teleosemantic theory of content which combines causal relations and the biological functions of consumer systems as criteria to attribute content. Contrary to teleosemantic theories of content which focus on the functions of producer systems (systems which produce perceptual states) I argue that we need to consider the function of consumer systems (systems which use perceptual states) in order to attribute in a determinate way perceptual content. And contrary to teleosemantic theories of content which focus on the functions of consumer systems (Papineau, Millikan), I argue that we cannot attribute content in a determinate way without considering the causes of a perceptual state. I show how content can be attributed to perceptual states with such a hybrid theory combining causes and functions of producer and consumer systems.

The previous chapter gives the criteria to specify what enters into the content of a perceptual state. The final chapter gives a more detailed account of what such a perceptual content looks like. It defends a theory of propositional content for perception. Perceptual content can be specified by a Russellian proposition constituted by objects and properties. I defend here the view that the properties entering content can be intrinsic or relational properties. Reasons are given why such a Russellian content gives a better account of the content of perceptual states than other versions of propositional or non-propositional content. The view is defended that such a theory of Russellian content can give a much better account of the phenomenology of illusions than a relationalist rejection of intentional content. I also

argue that not all theories of perceptual content but the present theory of Russellian content can meet the objections relationalists addressed to an intentionalist account of perception.

Chapter 1

Perception as Representation

Introduction

It is a widely held view that perceptions are a kind of representation of external objects, events and their properties. In perception we gain access to features of our environment. Perception provides us with information about the environment and it guides successfully our interaction with external objects. Perceptual states are therefore about something and have a representational (or intentional) content. This view of perception as representational states is broadly shared, although not uncontroversial as show the growing debates about relationalism. Less broadly shared is a consistent explanation of the representational status of perception. How can we explain that perception represents something? Several explanations of what makes perceptions representational have been given and the debate is still not closed concerning what the best explanation may be or even if there is any possible explanation of this representational status. In this chapter I will mainly try to clarify what is meant by the attribution of such a representational status to perceptions and why philosophy of mind and the cognitive sciences concur to attribute this status to perceptions. I will not decide here if the representational view should be accepted or rejected, but I want only to clarify what this view implies and commits us to. Furthermore I want to examine if there is one unitary conception of the representational view of perception, or if different disciplines (philosophy of mind, psychology, neurosciences) mean different things with the claim that perception is a form of representation.

When we say that perception is a representation, about which specific states are we speaking? (1) It has to be cleared first what we mean by perception and to which states we attribute a representational status and representational content. To answer this, I will delimit perception from other mental states which seem to share with them the property to be *about* something. I will also delimit perception from other representational states which are not mental. (2) Then I will consider the concept of representation used in the philosophy of mind, especially in the representational theory of the mind. (3) I will show how this concept of representation was then applied to the special case of perception. (4) I will compare this concept of perceptual representation to the one used in the psychology of perception. (5) Finally I will state the main challenges which are raised against the representational view of perception in psychology and philosophy. The discussion and possible answers to these

challenges will only be addressed in the subsequent chapters. The aim of this chapter is to state the position and the problems of the representational view of perception and to clarify the concept of representation as it is used in the content view.

1. Perception: A conceptual clarification

We have different sensory systems which provide us with information about the external world. The sensory systems register through some sense organ a physical stimulus which impinges on some receptor, e.g. the light on the retina. The physical stimulus is itself caused by some external object or event. The sensory receptor "transduces" the stimulus into an electrical impulse of the nerves. Different stages of cognitive processing in the sensory areas of the brain lead finally to a perceptual state, which is generally described as a conscious perceptual experience. Traditionally perception has been identified with this conscious output: a conscious perceptual experience with its specific phenomenology. The conscious experience can furthermore be used and modulated by higher cognitive functions. Attention can more or less be directed to the experience or to specific parts of it, through categorization the experience can be classified under different concepts and through perceptual judgments the perceptual experience is used in reasoning and linguistic utterances. Although we have the immediate intuition of a perceptual experience with its qualitative aspects, the psychology and the neurosciences of perception present us with a far more complex process which begins with the physical stimulus and ends with the use of perception in higher cognitive processing. When psychology or the neurosciences speak about perception, their investigation is not limited to the conscious output of perceptual processing, the phenomenology of perception. Before giving a definition of perception, I will make some distinctions: first, between processes in the sensory systems and phenomenal experience and second, between phenomenal experience and representational content.

We can distinguish in the case of perception between the phenomenal experience and the larger perceptual processing in our sensory systems which describe how that experience is caused and how it is used in further cognitive processing. Mostly, this perceptual processing is not conscious and we are only aware of some aspects of it, namely its results in conscious and phenomenal experience. Phenomenal experience is defined by the *qualitative character* of our conscious states. It is generally described by "what it is like" to have that experience, e.g. what it is like to see something red. Perceptions, emotions, feelings and moods are distinguished from other mental states (thoughts, beliefs) by this phenomenal character, the

fact that it feels a certain way to have them. All such states which have a phenomenal character are states of our phenomenal consciousness (Block 1995). Traditionally a further distinction was made about perceptual experience, that between sensations and perceptions properly. Sensations were conceived as the simple qualitative building blocks out of which were built more complex perceptual experiences, e.g. the experience of objects or scenes. Because it was thought that in sensations we have only the feeling of simple qualities and no representation of external objects, the concept of perception was restricted only to these more complex perceptual experiences (of objects, scenes). Only this was conceived as a perception of external states, while sensation was seen as an inner qualitative feeling which was not about something external.

From the phenomenal character of perception we have to distinguish *the representational content of perception*. My thoughts, beliefs, desires and generally all propositional attitudes represent something, namely what is expressed in their "that"-clause. If I believe that tomatoes are red, then "tomatoes are red" is the content represented by this belief. Such mental states can represent something without feeling a certain way, i.e. without a phenomenal character.[2] We do not need phenomenal consciousness, the qualitative feeling of "what it is like", to have representations. Equally in the case of perceptual experience, we have to treat separately the question of the phenomenal consciousness of perceptual experience from the fact that they represent something. Although representationalists suppose that the phenomenal character of an experience is explained by its representational content (Dretske 1995, Tye 1995, Lycan 1996), they do not identify phenomenal character and content. For them also, there are mental representations without phenomenal character and representation has to be explained by something else than phenomenal consciousness.[3] It is certainly an important problem to explain how representation and phenomenal character are connected, but as a first step, these two aspects of perception have to be separated, as they are separated in other mental states.[4] The investigation in this book will be limited to an explanation of the representational status and content of perception without trying to explain their phenomenal character.

Although we should separate the phenomenal character from the representational aspect in

[2] Some philosophers, for example Owen Flanagan (1992: 65), defend the position that believing something has also a phenomenal character. It feels like something to have the belief attitude toward a content.
[3] The philosophers who defend the position of „Phenomenal Intentionality" (Horgan and Tienson 2002, Kriegel 2013) want to explain intentional (or representational) content by phenomenal consciousness. I do not want to presuppose that position in the present investigation.
[4] See Chalmers (2004), for the relation between phenomenal character and representational content.

perception, it might still seem that we can pick out perceptual states only through phenomenal consciousness. Traditionally philosophy made such an identification of perception with conscious perceptual experience, but there are strong reasons not to limit perception to conscious, phenomenal experience and to look at the larger perceptual processes described by the sciences. The phenomenology of perception is therefore not sufficient for a definition of perception. The main reasons for this are such phenomena as blindsight (Weiskrantz 1986) and the dual process theory of vision (Milner and Goodale 1995/2006). Both phenomena show that we can use perceptual information in our behavior and guide our actions in accordance with the properties represented by this perceptual information without being phenomenally conscious of that perceptual information. Weiskrantz showed in his experiments that people without a perceptual experience of certain areas of their visual field still perceptually represent information about this blind area. When forced to attribute a color to the visual area they cannot (consciously) see, they still give with a high probability a correct answer about the color. Goodale and Milner showed that only a part of visual processing is used for the conscious representations in visual experience (this processing for conscious representation is done in the "ventral stream" of the visual brain). The guidance and control of action heavily relies on visual information which is not conscious (and which is processed in the "dorsal stream" of the visual cortex). People with damage in their ventral stream and therefore with blindness or heavy impairment of their visual experience can still accurately guide their behavior towards objects they cannot consciously see. In forced choice tests in which they are pushed to grasp into their invisible environment, they correctly reach an object in front of them. This grasping movement cannot be explained if we do not attribute the use of visual information to these people. These cases show that people still have perceptual representations (of color, object distance, object size or shape) without perceptual experience i.e. phenomenal consciousness of these representations. They still use these perceptual representations in their behavior without being conscious of them. Cases like these show that we cannot identify perception with perceptual experience i.e. with the perceptual states we are phenomenally conscious of.[5] And a theory of perceptual representation should not exclude such cases where there is no phenomenal experience. Perception and perceptual representation extends beyond phenomenal experience. We have perceptual states which are conscious and others which are not.

I distinguished earlier the mostly unconscious perceptual processing in our sensory systems from phenomenal perceptual experience. The perceptual processing in the sensory

[5] For a similar position, see Brogaard (2011a), Prinz (2010).

systems has perceptual experiences as its output, but is much more extended than the states we are conscious of. What are now the perceptual states we are talking about when we do not want to limit perception to conscious perceptual states? Are these all states between the stimuli and the higher cognitive functions (belief, action) using perceptual information. Some philosophers situate perception more closely toward the stimulus (Dretske 1969 and 1995) and some assimilate it more to the higher cognitive processes, to conceptual classification (McDowell 1996) or perceptual beliefs (Armstrong 1968). It seems somewhat arbitrary where to situate perception. Are all states of the complex processes in the sensory systems and all their output perceptual states? Should therefore all these states have a representational content, if the representational view of perception is true? Obviously we must constrain somehow which states are classified as perceptual states. Here I will follow some attempts to define perceptual states by their functional role, as this has been attempted by Dretske (1978).

Perceptual states can be delimited (1) by their etiology, by what causes them or what normally causes them. Here perceptual states should have some causal relation to external stimuli. (2) Perceptual states can be delimited by the function they have. Here perceptual states should serve some other cognitive or psychological mechanism, e.g. by providing for this mechanism some information about the environment. So, perceptual states can be defined by their functional role, by the causal relations to their input and output.

(1) By perceptual states we mean some neurophysiologic state of the sensory systems, e.g. a firing rate of some neuron in the visual sensory system (visual brain). A lot of states in these systems do not carry any information about external conditions.[6] They have a different physiological function and do not vary with any changes in the environment. Therefore only such states which do vary or which usually vary with external conditions, which therefore carry information about these conditions or have the function to carry such information can count as perceptual states. Perception cannot be restricted to states which *actually* vary with some external condition, because that would make perceptual illusions and hallucination impossible i.e. seeing a property or an object which is not there. There must be the possibility for perceptual states which seem to indicate some external condition although there actually is no such external condition. But generally we can say that this etiological condition for perceptual states fits well with the way neurophysiologists study perception by looking at those neurons which vary with a certain external stimulus presented to the tested individual (Hubel 1995).

(2) There may be some states of my body which vary with external conditions, but which

[6] I limit my investigation to external perception i.e. to the perceptions of conditions outside the body. I will explain on p. 21-22 this pragmatic limitation.

would hardly be considered as perceptual. For example states of my respiratory system may vary with the condition of the atmosphere; my lung may register poor oxygen in the atmosphere. A scientist could even "see" by looking at my lung that the atmosphere is poor in oxygen. It would indicate that external condition to him. But as this state of the lungs is not a state of any of my sensory systems, this would not fulfill the previous etiological condition.

But there can be similar cases in our sensory system. For example the rhythm of internal organs of the body is regulated by day/night cycles, the circadian rhythms. These rhythms adjust to external conditions by using external cues, called "zeitgeber". The light conditions are detected by the retina and sent to the brain (to the suprachiasmic nucleus in the hypothalamus). From there, this information is sent to different bodily organs which adjust to this cue. The states in the retina and in the brain vary with external conditions (intensity of the light) and at least the state in the retina is part of my visual system. But it would be strange to call this case of regulation by circadian rhythms a case of perception. The state which carries information about some external stimulus must serve some specific *psychological* system to be a case of perception. Dretske (1995), following Evans (1982), thought that a mental state must serve as input to some concept-using and reasoning system, contrary to non-mental natural representations i.e. states, like the states about "zeitgeber", which carry information and are used by non-mental systems of the body.[7] In an earlier attempt to define perception, Dretske thought that a state, to be perceptual, must make "stimulus information" available not to a part of a system, but to the system as a whole (the whole organism) (Dretske, 1978). A state which fulfills the right etiological conditions is a perceptual state, if it serves the desires, needs and the behavior of the organism as a whole and not only some sub-system of the organism. If we look at the dual process theory of vision, it is not appropriate to define perception as the input to only one specific psychological system or mechanism (for example only as the input for central and conceptual processing, or the "reasoning system"). Some perceptual states directly serve the guidance of action without serving the intermediary of a reasoning and concept using system. They serve a specific sub-system (action) without being accessible to other psychological systems (conscious experience). In this sense they do not serve as input to the organism as a whole.

There is a further reason, why it is preferable not to restrict perceptual states to the states which serve as input to some central processing system, generally conceived as a conscious concept-using and reasoning system. The standard conception of the mind subdivides the mind into perception, central processing and action. Every perception is

[7] Fodor (1983) also defines perception as an „input system", meaning by that an input to central symbolic processing.

considered as an input to central processing and every action follows from central processing. This picture has been strongly criticized recently as the sandwich-picture or the input-output picture of the mind (Hurley 1998, Bermudez 2005). It is better to avoid this traditional view of the mind.

I will therefore give the following definition of perceptual states: Perceptual states are those states of our sensory systems which are normally caused by some external stimulus and which serve *some* mental function or *some* psychological mechanism (e.g. cognition, guidance of action, emotion).

A further distinction is necessary to delimit perception from higher cognitive processes. *Perceptual states* are *distinguished from perceptual judgments and beliefs*. We can have a percept without forming a corresponding perceptual judgment. Furthermore the content of beliefs and judgments is composed of concepts. Beliefs and judgments have therefore a conceptual content. This needs not to be the case for perceptual content. Although conceptualism identifies the content of perceptions with conceptual content, this identification is highly debated and contested (see Kelly 2001 for the arguments against conceptualism) and many philosophers defend the position that perception has a non-conceptual content (Dretske 1995, Tye 2005). I will argue later against conceptualism and defend a version of non-conceptual perceptual content (see chap. 5). But even if conceptualism is accepted, it is recommended to keep the distinction between perception and perceptual judgments.

As the previous discussion showed, we cannot identify perception with phenomenal experience. Still we have a phenomenal experience of a lot of our perceptual states. The question has been raised how far perception extends into our phenomenal experiences. Is the feeling of pain a perceptual experience? Are emotions cases of the perception of bodily states (see Prince (2004) for a perceptual theory of emotions)? How far can the concept of perception be applied to the consciousness of inner states? I cannot answer these questions here and for pragmatic reasons, I will limit my investigation to so called external perception i.e. the perception of objects, events and properties outside of our body, the perception of the environment. The distinction is not always sharp and has to be somewhat softened where the perception of external objects relies partially on information about the body. The distinction is only pragmatic and I do not want to suggest an essential difference between the perception of internal states of our body and the perception of external things. I will not discuss here, how far the concept of perception can be applied to inner states and how far proprioception can be extended, from the unproblematic cases of the perception of the position and movements of our limbs to emotions or higher mental states (see perceptual theories of emotion and of

consciousness i.e. the higher order perception theory of consciousness). Equally, I will not discuss the question how far the representational view of perception can be extended to internal perceptions. Strong representationlists (Dretske 1995, Tye 1995) claim that all our phenomenal experience is explained by the representational content of these experiences, may that experience be of external objects or inner states.

2. The Representational Theory of the Mind and the Concept of Representation

After this delimitation of perceptual states, I want to address the question why many philosophers consider that perceptual states are representational states. But to address this question, I will consider first and more generally the appeal of the representational view of the mind, of which the representational view of perception forms just one part. The *Representational Theory of the Mind* (RTM)[8] claims that all mental states are representational states. It can be seen as a restatement of the Brentano thesis (Chisholm 1957) that intentionality is the mark of the mental.[9] But contrary to Brentano and Chisholm, the Representational Theory of the Mind tries to explain representation in a naturalistic framework. Brentano (and Chisholm) explained intentionality as a relation between a representation (some psychological state) and its content, the intentional object of the representation. Brentano considered the intentional object to be a non-existent object (he actually called intentionality "intentional inexistence"[10]). As every physical relation presupposes the existence of its relata, the intentional relation could not be in his view a physical relation. For Brentano and Chisholm mental states as intentional states were therefore non-physical. Contrary to this claim, the Representational Theory of the Mind wants to give a naturalistic (or physicalist) explanation of mental representation.

The Representational Theory of the Mind was originally a "happy" combination between the mental states folk-psychology attributes to us and the computational conception of the mind developed by the cognitive sciences.[11] Let us look first at the mental states folk-psychology intuitively attributes to minds. We explain the behavior of people by attributing to

[8] See Fodor (1985).
[9] I consider the terms "representational" and "intentional" as equivalent. Every state which has intentionality is a representational state and every representation has intentionality. Later (see chap. 3), I will distinguish "intentionalism" from "representationalism", intentionalism being the general claim that mental states have intentionality, "representationalism" being a more restricted claim about consciousness which states that the phenomenal character supervenes on intentional content. "Intentionalism" was initially introduced and discussed under the name "Representational Theory of the Mind", so I will keep in this chapter the older name.
[10] Brentano (1874/1955: 124-25).
[11] It seemed a "happy combination" in the sense that our folk-intuitions seemed to give support to the scientific theory and because the scientific theory seemed to explain folk-intuitions. On this "happy" combination, see Ramsey (2007: chap. 2).

them mental states like beliefs and desires. Someone goes to see a movie because he believes the movie *M* is playing now and he desires to see the movie *M*. We have also the intuition that these mental states can be evaluated. They can be correct or true in the case of belief or fulfilled in the case of desire. Such folk-psychological notions as beliefs or desires are generally analyzed as propositional attitudes. The belief is a certain attitude toward the proposition expressed by the sentence "the movie *M* is playing now", for example. This sentence expresses the content of the belief. The sentence and the proposition expressed by it it have semantic properties. The proposition means something, refers to certain states of the world and has truth conditions. The proposition is true if my movie theater actually is playing *M*. These semantic properties of the proposition, and therefore of the belief, can explain the intuitive evaluation of beliefs which take place in folk-psychology. We evaluate beliefs as correct or incorrect, as true or false and they are true or false because they have a semantic content which indicates truth conditions. As we have similar intuitive evaluations of our perceptions, as we also consider some of them as accurate and others as inaccurate, the representational theory of the mind suggests an explanation of our intuitions about perceptions on the model of the explanation of beliefs or other propositional attitudes.

Far back in the history of philosophy, we can find theories which defend that mental states represent something because they have a content. And we can find the analysis of folk-concepts like beliefs and desires in terms of propositional attitudes since Russell (1921). But the Representational Theory of the Mind as it was developed by Fodor (1980 and 1985), Field (1978) and Dretske (1981 and 1988) combined this analysis of propositional attitudes with the computational conception of the mind developed in the cognitive sciences. This conception explains mental processes on the model of computation. A mental process is composed of physical symbols and syntactical rules which specify how the symbols are combined, manipulated and transformed. The syntactical rules only take into consideration the physical properties of the symbols, their intrinsic properties. The rules indicate how a symbol with certain intrinsic properties (a symbol of type A) is to be transformed in a symbol with other intrinsic properties (symbol of type B). Such a purely syntactical computational description could explain how a belief follows inferentially from other beliefs by just giving the rules about how tokens of symbols are transformed into other tokens of symbols. But such a description does not take into account any semantic properties of the symbols i.e. what these symbols might mean or refer to. The advantage of this computational theory is that the physical implementation of such symbolic processing is no mystery and is already realized at a certain level of complexity in computers. The disadvantage is that the theory ignores the

semantic relations mental states seem to have to external events or objects. We do not just want to know how arbitrary symbols are transformed, but how beliefs *about* X are transformed into beliefs *about* Y, how for example a perceptual state *about* physical stimuli is transformed into a perceptual state *about* a 3-dimensional object. The Representational Theory of the Mind combines the computational theory with the idea derived from folk-psychology that mental states have semantic properties, that they mean and represent something. For the Representational Theory the symbols of the computational theory have these semantic properties. They are the vehicles of representation. This representational view explains mental processing computationally and needs an additional theory to explain why symbols represent and what they represent.[12]

We saw already how the Representational Theory of the Mind analyzes mental representations like beliefs or desires. But more specifically, which concept of representation is used in that theory? Representations are states which have content. Pictures, maps, linguistic expressions are representations and they have content. Their contents are the properties or objects represented by them. Contrary to these external and *non-mental* representations, we can characterize beliefs, mental images, perceptual states as *mental* states which have content.

In a representation we have to distinguish between the *vehicle of representation*, e.g. the physical image (photo) or a neural state in the brain, and what is represented by that vehicle. We have therefore also to distinguish the properties of the vehicle and the properties represented by the vehicle and given by its content. A black and white photo of a person has the property to be two dimensional, to be made of paper with black and white areas on its surface. These are the properties of the vehicle of representation. But the represented properties are for example the properties of a person (legs, hands, face etc.), properties instantiated by the represented person. Sometimes the properties of the vehicle and the properties represented by the vehicle are confused. It is not the case that when we represent a red object, there must be some mental state which has the property "red" (a mistake sense-datum theorists often make) (Harman, 1990).

When I speak of the *representational content*, I refer to what is generally meant by intentional content, i.e. the content given for a state which has intentionality. Representation is here used synonymously with intentionality and we can define representation by the features of intentionality. Chisholm characterizes all "psychological phenomena" by intentionality, what he calls also "relation to a content" (Chisholm 1957: 168). He gives essentially two

[12] For a good description of the combination of the computational theory with the representational view about mental states, see Sterelny (1991: chap. 2) and Ramsey (2007: chap. 2).

criteria for intentionality (Chisholm 1957: chap. 11)[13]:

(1) The *power to misrepresent*. The content of intentional states may refer to something which does not exist. Intentional states have therefore the power to misrepresent, to indicate something which is not the case. From this property, it follows for any intentional content, that we cannot existentially quantify over statements which express this content. Let us take for example some ascriptions of belief: "Peter believes that the king of France is bald", or "Peter believes that the Queen of England is married". From the truth of these sentences we cannot conclude that there is an X which is king of France and bald or that there is a Y which is queen of England and is married. There is failure of existential quantification over the intentional content. The same is the case for perceptual states: "I have a visual experience of a white rat" does not imply "There is a white rat". My experience of a white rat may be an illusion or a hallucination.

(2) *Intensionality*. In an intensional context (in a that-clause expressing the content of a belief, for example) the substitution of co-referential terms does not preserve truth. In these contexts not only the extension of the terms, but also their intension plays a role for the truth of the proposition. In the case of intentional states like propositional attitudes, this criterion for intentionality applies easily. They have a propositional content and propositions are composed of concepts which have an intension. It is less easy to see how this second criterion may apply to the content of perception. What may be co-referential terms in the case of perceptual content, if we suppose that perceptual content is not conceptual?

A representation must at least show one of these "marks of intentionality" to be qualified as a representation. In the philosophy of perception mainly the power of misrepresentation has been emphasized as criterion of perceptual representation (Dretske 1986, Tye 1995: chap. 4). I turn now to the question how this concept of representation applies to perception.

3. Perceptual Representation

The representational theory of the mind was originally developed to explain the semantic properties of the propositional attitudes, but was then extended to perception (Searle 1983, Dretske 1986 and 1995, Matthen 1988, Tye 1995, Lycan 1996). A belief represents through the semantic properties of the proposition toward which we have the belief-attitude. The

[13] We give these two "marks of intentionality" the names they have now usually in the literature. Chisholm did not give them these names. But we follow Chisholm in his description of these "marks" or criteria of intentionality.

representational theory of the mind conceives that perception is similar to propositional attitudes: a perceptual state represents by expressing some content (a proposition or some non-propositional content).

Generally, the representational theories of perception state that a perceptual state X represents some property P of an object due to some regular correlation between the perceptual state and that property. Influenced by the causal theory of reference (Kripke 1980 and Putnam 1975), this correlation is conceived as a causal one: the perceptual state X represents P, if P normally causes X. Drestke (1995) describes in the following way the condition for perceptual representation: some internal states of a sensory system represent some property P of the environment (for example shape), if the internal states causally vary with the values of property P. The internal states (x_1, x_3, x_3…) of the sensory system represent shape if these internal states change with the shape of some external object (given that the shape of an object changes with our perspective on it). Perceptual states cannot represent every kind of property, but are limited to certain type of properties. For example in visual perception these properties are generally color, size, shape, orientation and distance of an object. We cannot perceptually represent abstract properties like "object" or general categories of things (kind properties) like "tree", "animal" etc. We believe or judge that this thing we see is an animal, but we cannot perceptually represent that this is an animal. Perceptually only shape, size and color of the thing are represented.[14]

But for a theory of perceptual representation, the causal relation between the objects which has property P and the internal state is not enough. We need a further criterion to characterize the relation of representation, because if the relation between a perceptual state and its represented property is only defined by a causal relation, this would exclude the first condition of intentionality: if "P causes X" is true, then it is also true that P and X exist. If X represents P only when it is actually caused by P, then X will never falsely represent P. Perception only defined by a causal relation would exclude intentionality, it would exclude the power to misrepresent and it would exclude perceptual illusions. For an explanation of perceptual representation by some causal relation, it has to be added that X represents P when it is *normally* caused by P or when it is caused by P under *optimal* conditions. This lets open the possibility that X represents P also in the case where there is no P and where it is caused by some other property (the first condition of intentionality). In such a case X would be caused by Q but we could still claim that it represents P. P is *normally* its cause, but in this case the perceptual state is caused by some other property. X would falsely represent Q as a P.

[14] For a defence of the position that kind properties are represented by perceptual experience, see Susanna Siegel (2010). I will discuss which properties can be represented in perception in chapter 5.

It would be a case of perceptual illusion.

For a theory of perceptual representation we need therefore to give some coherent way to explain what these *normal* or *optimal* conditions might be. I will discuss in chapter 4 the conditions which must be met for a causal relation to be content-fixing. Without such a specification of the normal or optimal conditions, the causal relation between a property and a perceptual state can not be called a mental representation. It would not fulfill the conditions of representation given in the definition of intentionality.

The second condition for intentionality is more problematic, because it implies the substitution of co-referential terms. A representation is intensional, if its truth-conditions are not preserved with the substitution of co-referential terms. This implies different modes of presentation which refer to the same thing or property. It is difficult to see how perceptual experiences can be different and refer to the same property. Block (1990) defends a view, where the same property can be represented through different sense modality. The same property, for example the shape of a ball can be represented by touch or by sight. In this case we would have two sensory modes of presentation of the same property, roundness. This implies the assimilation of perceptual content to concepts, to entities which have an extension and an intension (or to Fregean senses, a position defended by Chalmers, in 2006). As it is contested that there actually are such sensory modes of presentation, I consider the first requirement for intentionality, the power to misrepresent, as a sufficient condition for the attribution of the representational status.

A further characteristic generally admitted in representational theories of perception is that perception is a natural form of representation and that it has *original intentionality*. A theory of representation must explain why certain entities are representations and what gives them this representational status. Or there are representations which can be explained in a derived manner. Pictures, instruments of measurement, language represent because we have certain intentional states when we use or interpret them. They are representations in a derived manner. Their representational status is derived from other representations, from other intentional mental states. Obviously, we cannot explain all representations by deriving them from other representations, because that would lead to an infinite regress. Therefore theories of mental representation accept that there are some mental states which are not derived representations, but non-derived, natural representations (Searle 1983, Dretske 1995). Perception seems to be of this non-derived type. They do not represent, because they are derived from other mental representation. They have what is called original intentionality. This implies that we have to explain why they are representations without recurring to other

mental representations. We have to explain that either by some intrinsic properties of these states or by some mechanisms which are simpler then mental representations. Naturalistic theories of perceptual representation have generally tried to explain why perceptions represent by some causal mechanisms and some teleological and functional properties of the perceptual states (Fodor 1990, Dretske, 1995, Millikan 1989 and 2004).[15] These teleological or functional properties of perceptual states try to spell out what the perceptual states have the function to represent. If a perceptual state has the function to represent P, then we could explain how it can represent P even in those cases where it isn´t caused by P. I will come back in chapter 4 to the problem how to spell out a representational theory of perception through the causal and functional properties of perceptual states.

It is essential for a theory of perceptual representation to be able to *give the content* of a perceptual state. A theory of perceptual representation must give criteria which permit to determine what the content of the state is. Through these criteria we must be able to say which properties or objects a state represents. For beliefs we say that the content gives the truth conditions of the belief. As perceptual states can be partially true and partially false, we do not speak of truth conditions in the case of perception, but preferably of *accuracy conditions*. The content of a perceptual state therefore indicates the accuracy conditions of the state. It says which properties and objects must obtain in the world in order to make that perceptual state accurate.

There are therefore several requirements for a theory of perceptual representation:

(1) The theory must show that perception has the power to misrepresent. Perception has accuracy conditions. It must be possible that a perceptual state is inaccurate. In chapter 3, I will defend the view that perceptual states can be inaccurate.

(2) The theory must show by which mechanisms perceptual states can have that power to represent. It must show which mechanisms explain this power to misrepresent. I will give in chapter 4 a description of the mechanisms which explain representation.

(3) The theory must give the criteria which permit to determine what the specific content of a perceptual state is. In chapter 5, I will describe the specific contents of perceptual states.

To fulfill the first condition, we could for example rely on our intuition that perceptions are sometimes inaccurate and can therefore fail to represent correctly certain properties of the environment. That would not explain how perceptual states represent but would just reflect our intuition that they do. As our intuition could be wrong, it is a further

[15] Fodor (1987, 1990) explains representation only by some causal mechanism and rejects the use of biological functions in his explanation. Other theories of perceptual representation combine causal explanations with explanation by biological functions (Dretske 1988, Matthen 1988, Millikan 1989).

(second) requirement, to show through which mechanisms sensory systems represent and through which properties perceptual states have their representational status. That is what naturalized theories of mental representation generally try to do. They try to explain that perceptual states represent, because they are caused in such and such a way by certain properties or objects and that they have certain functions to provide information about these properties or objects. Still that might not be enough for a theory of perceptual representation, because these causal and functional relations may leave the content indeterminate. This is a central problem for representational theories. For example, a causal explanation of representation lets the content indeterminate, because the cause of a perceptual state is a sequence of events. It is not clear which element in that sequence determines the content. The same indeterminacy can appear in the explanation of content by biological functions. Is it the function of the frog´s eye to represent flies, small black dots or flying food. These are different properties. Which ones are part of the content of the frog´s perceptual states and which ones determine its accuracy conditions? As it is essential for perceptual representation to have a content which gives accuracy conditions, a theory of perceptual representation must be able to specify this content and these accuracy conditions. If these conditions cannot be met, it is tempting to claim that perception after all is not representational.

Until now I have stated that the representational view is widely accepted in the philosophy of mind and I have stated the requirements for such a representational view. I have also indicated that it seems to many philosophers intuitively plausible that perception has a representational content. But I have not addressed the question what makes this intuition so plausible and strong. Certainly we think that perception can mislead us and that it can be inaccurate. And this impression is fueled by the phenomenon of perceptual illusions. Illusions seem to require an explanation of perception in terms of representations, i.e. in terms of states which can be false, erroneous or inaccurate. In chapter three, I will come back to the question how illusions were used and can still be used to defend the view that perception represents.

4. The View from the Cognitive Sciences

I discussed in the previous sections the representational view of perception as it is defended in the philosophy of mind and the philosophy of perception. In the psychology of perception, the term “representation” is also heavily used and many psychological theories of perception defend the position that perception is a form of mental representation. The question arises therefore if the psychologists use a concept of representation similar to the concept used by

philosophers. This question has to be clarified also, because philosophers often defend their views of perceptual representation by referring to the use of the concept of representation in psychological (or neurophysiological) theories of perception. For example some philosophers (see Noë 2004) claim that perception is not a form of representation, because psychologists have strongly contested that in perception we construct a complex mental model of the external world, an internal model often called "representation". Psychologists have often contested that view of perception as model construction by saying that such perceptual representations do not exist. But that rejection of "representation" is not a rejection of the representational view as defined in the previous sections. It is possible to reject such a complex representation and still think that perception has representational content. A neural state may have the perceptual content "red" without being an inner model of the external environment. It is therefore important to describe the different notions of "representation" used in the psychology of perception and to see how much these notions overlap or differ from the philosophical concept of representation defined as a mental state with intentional content.

I will here distinguish three uses of the term representation in psychological theories of perception: (1) a mental representation is a mental state which indicates or informs about properties of the external distal stimulus. This use is more or less similar to the use in the previously described philosophical theories. (2) Representation as an *inner mental model* or picture, (3) representation as *information storage* in the mind or more specifically in memory. Only the first use corresponds more or less to the concept used in the representational view of the mind. The two other uses of the term "representation" do not directly affect the arguments for or against the representational view of perception as it is defended in the philosophy of mind.

(1) In the psychology of perception, representation is often used to emphasize that our perceptual states cannot be explained alone by the properties of the proximal stimulus (for example in vision by the properties of the "image" on the retina). In perception this information at the proximal stimulus is used to get some information about the external objects (the distal stimulus).[16] In this view of perception, what we see is the result of some constructive addition to the information present in the stimulus to get information about objects in the world, for example the information in the two-dimensional "image" on the retina is processed to get a three-dimensional representation of some object. The psychologist

[16] I will use here the notion "stimulus" for the proximal stimulus and "object" for the distal stimulus. "Stimulus" refers to physical properties at the perceptual receptors and "object" refers to the properties of external physical things.

Irvin Rock (1983) calls such theories "constructive theories" of perception. With the rise of cognitive psychology and its computational description of mental processes, this constructive process in perception was described as a form of *inference*. Constructive theories of perception, as developed by Marr (1982), Rock (1983), Palmer (1999) or Pylyshyn (2003), describe perceptual processing as the constructive process whereby some inner principles and assumptions are used in the sensory systems to "infer" from the often poor information at the proximal stimulus the properties of external objects. Through this inferential processing a representation of external objects is constructed. Palmer (1999) states that perception is confronted with the so called "inverse problem" (Palmer 1999: 23): in our perceptual experience we have representations of properties which are not given in the sparse information present in the proximal stimulus. For example, we represent *three-dimensional* objects which have to be inferred from a *two-dimensional* retinal image. Quite different three-dimensional objects can project the same two-dimensional image on the retina. How does the visual system "decide" which three-dimensional shape is actually in front of us? This is the inverse problem. Palmer supposes that we actually see in our perceptual experience the properties of distal objects and that these properties are the product of some inference solving the inverse problem.

These psychological theories posit that perception is the result of some process which represents properties of external objects and events. This is expressed most clearly by Irvin Rock (1983), who writes: "External objects and events are *represented mentally in the form of propositional knowledge*. The very essence of intelligence in living creatures, in my opinion, is *the capacity to "know", to represent objects, events, and relations* in a form that is subject to confirmation and disconfirmation. The claim, then, is that perception also is based on this form of representation." (Rock 1983: 15) Later he adds: "*perception is the mental representation of external objects and events* that is based upon or in some way corresponds to the stimulation reaching our sense organs" (Rock 1983: 28).[17] Perception is described here as a mental state which has semantic properties; a state which can be accurate or inaccurate (confirmed or disconfirmed). It can misrepresent. Palmer (1999) has a similar view, when he defines visual perception as "the process of acquiring knowledge about environmental objects and events by extracting information from the light they emit or reflect" (Palmer 1999: 5). He underlines that the information gained in perception can be evaluated for its accuracy.[18] These

[17] Emphasis added by me.

[18] That perception has accuracy conditions for Palmer is clear from the following passages: "Indeed, vision is useful precisely because it is so accurate. By and large, *what you see is what you get*. When this is true, we have what is called *veridical perception* (…): perception that is consistent with the actual state of affairs in the

descriptions of perception correspond quite closely to the philosophical view that perception is a representation which has intentional content specifying accuracy conditions. A similar use of representation can be found in neurophysiology, when scientists try to determine the function of certain neurons or group of neurons in the areas of the brain dedicated to the processing of information coming from the sensory organs, for example the functions of the neurons of the visual brain. Studies like those of Hubel and Wiesel (1962) tried to determine the function of specific neurons in the visual cortex of cats. They recorded the activation of particular neurons when a specific stimulus was presented to the cat. They showed that specific neurons react to only vertical long objects (black bars). These neurons are triggered by this type of stimulus. Sometimes in the neurosciences the notion of representation is just used as an equivalent of such a causal correlation between stimulus and a certain brain activity. A state is said to represent an external property, if it correlates with the presence of that property. Such a use of "representation" would diverge from the meaning of the term in the philosophy of mind. But generally, the neurosciences do not only describe causal correlations, but determine furthermore the function of certain parts of the brain, certain neurons or groups of neurons. Such was also the aim of the single neuron recording research done by Hubel and Wiesel. They wanted to determine the biological function of specific brain areas. In that sense a neuron can have the function to represent a certain color, even if it does not react in an actual case to that color and even if it can be triggered sometimes by some other internal or external event. It simply would be mal-functioning in these cases without loosing its function. Similarly, we would still attribute to a mal-functioning heart the function of pumping blood (see Neander 1995). Such neurophysiological theories of perception are not far away from a teleological theory of intentionality.

We can therefore find in the psychology of perception and in the neurosciences the term and concept of representation used in a similar way as in the representational theory of the mind. But the term is also often used in other ways which diverge from the discussed philosophical meaning. We have to discuss these other uses in order to avoid confusions.

(2) The psychology of perception often uses "representation" in a much broader sense, namely as an equivalent of an inner picture or inner model of the outside environment, of outside objects or events. It is supposed that perception is representational, because it consists in the construction in the mind of a complex and detailed picture-like layout or map of the environment. Artificial intelligence (Brooks 1991) as well as recent psychological studies on change blindness (Levin and Simons 1997a and b) and inattentional blindness have criticized

environment" (Palmer 1999: 6). He also says: "vision provides spacially accurate information from a distance." (Palmer 1999: 6)

the idea that there actually is such an inner model or picture. Although we have virtually access to a great diversity of details in our visual environment, these experiments seem to indicate that we do not visually represent the environment like a rich and continuous photographic image. We pick up certain salient details and other sometimes massive aspects in focal vision escape our view or our attention. In a video testing the phenomenon of inattenional blindness, a gorilla dancing through a team of basketball players is not seen, when the observers are asked to attend (and count) ball exchanges (Simons and Chabris, 1999). Some psychologists said therefore that this view of visual representation as a complex, rich and photographic inner picture is a "grand illusion" (O´Regan, 1992).[19]

In artificial intelligence, Rodney Brooks (1991) also contested the necessity of a complex inner representation in order to fulfill the tasks of a complex interaction with the environment. For Brooks, it is sufficient for complex behavioral tasks in robotics that information is picked up just when it is needed and just those details that are needed without there being a need to construct a complex map or inner representation. Sometimes these developments in the cognitive sciences are used as arguments against the notion of representation in general. Certainly inner pictures and models were conceived as representations of the environment, but a rejection of such pictures and models only affects a certain type of representations. It mainly affects certain claims about the richness of perceptual representations. The described developments in the cognitive sciences show that perceptual representations are much poorer then thought, but they do not show that there is *no* perceptual representation. We can find psychologists like Pylyshyn (2003) who reject the picture view, but still defend the notion of perceptual representation as defined in (1). The two notions of representation are actually independent: it could be that there is some topological mapping between the structure of some external stimuli and some internal structure in the brain caused by these stimuli. There would be a picture-like relation between the stimuli and the brain region, but still these events in the brain may lack any semantic properties. They would not be representations in the sense (1). On the other hand a neuron could represent some external property without being a picture. It would just be an arbitrary symbol for some external feature without any similarity relation to what it represents. In this case we would have representations without any inner model or picture. Brooks also suggested that the information about the environment needs not to be given through a central model, but may be distributed in different parts of the robot. This distributed representation would preserve the

[19] Based on this research, Alva Noë criticizes what he calls the „snapshot conception" of visual perception. This snapshot conception is one example of a representation in the second sense discussed here, see Noë (2004: chap. 2).

richness of the information about the environment without being bundled in a central picture or model. Each part of a robot (or of an organism) has just access to the information it needs for its behavior. In this case we would still have a representation without inner models or pictures.

(3) In the psychology of perception the notion of representation is sometimes used in the sense of *preserved or stored information.* In debates about change blindness the question whether perception is representational was assimilated to the question how extensively we store perceptual information between views (Simons 1996; Simons, Chabris, Schnur 2002). Psychologists claimed that visual information is mostly used online and is not preserved when the stimulus changes i.e. when there is some change in the visual field. This would explain why in change blindness experiments massive changes in seen videos were not noticed: from one screen shot to the next the information is just not kept. The information in the new screenshot cannot be compared to the old one and therefore the difference is not noticed. Simons et al. (2002: 78) say for example: "The pervasiveness of the inability to detect changes is consistent with the theoretical notion that we internally represent relatively little information from our visual world from one glance at a scene to the next. However, evidence for change blindness does not necessarily imply the absence of such representation – people could also miss changes if they fail to compare an existing representation of the pre-change scene to the post-change scene." Here the "absence of representation" neither implies that perception cannot be evaluated for accuracy (sense (1)), nor that we do not have a complex model or picture of the environment (sense (2)), but only that in perception the information is mostly used online and is not stored. "Antirepresentationalists" in the philosophy of perception use often the argument that perception is not representational, because it is mostly an online access to the environment. We therefore use the world as an "external memory" (O'Regan 1992) instead of storing the information internally. This criticism of "representations" only rejects this third sense of the term. It neither implies that when we perceive something online, this perceptual experience cannot be evaluated for accuracy and does therefore have no content, nor does it imply that perception is no inner picture. It rejects representation as inner storage in memory.

The three senses of the concept of representation in the psychology of perception (and in the cognitive sciences) are sometimes confused. It is not uncommon to encounter a general criticism of "representationalism" based on the rejection of representation in the second or third sense. When I will speak about the representational view of perception, I mean it in the first sense only, representation as an intentional, content bearing state. A rejection of that

representational view cannot just be based on the rejection of representation as inner picture or representation as internal storage. Certainly some aspects of representation as inner picture or as storage can be used in an argument against the representational view. For example the view that perception is mostly an online access to the environment without much storage can be used to argue for a relational view of perception. But online perception per se is not in contradiction with the representational view. A rejection of perceptual representation in the sense (2) and (3) does not per se imply a rejection of the representational view. It is therefore important to separate these different meanings of "representation".

5. Challenges to the Intentionality of Perception

The representational view of perception has been confronted with different challenges. We can distinguish three types of challenges: (1) a general rejections of intentionality; (2) a rejections that specifically perceptions have intentionality; (3) challenges to specific versions of the intentionality of perception. Let us look at three types of challenges.

(1) The rejection of intentionality in general: Such views, which can be called *intentional irrealism*, reject that any mental state has intentionality, therefore also perceptual states are not intentional states. *Intentional irrealism* rejects generally the notion of mental representation and intentionality for mental states. We can distinguish a computationalist version and an anti-computationalist version. The computationalist version accepts that mental processes are symbolic and governed by rules, but rejects that we can give a semantics for these symbols. Stich´s syntactic theory of the mind is such a position (Stich 1983). Dynamic systems theory is a more radical form of intentional irrealism, because it rejects also the symbolic processing of classical computationalism (Van Gelder 1995). There are only causal interactions between internal and external events which can be modeled mathematically by a series of differential equations. There is no specific difference of the interaction between mind and world to any other physical interaction in nature.

The emphasis on extended cognition (Clarke/Chalmers 1998) is another development which tries to reduce the role of inner representations. Mental processes are seen here in interaction with bodily activities or continuous with processes external to the human body. Causal interactions between the brain, the body and the world are emphasized and the semantic relations between inner states and the external world lose their importance in this framework. But the extended mind hypothesis per se does not imply a rejection of the intentionality of mental or perceptual states and advocates of this thesis criticize the anti-

representationalist rejection of intentional states (Clarke 2008). Only certain radical versions of extended cognition want to reject mental representations (see Chemero 2009).

(2) A rejection of the intentionality only as far as it is applied to perception: Such views accept that there are mental states which represent and which have intentionality, but they reject the view that perceptual experiences or perceptual states are among these intentional states. Certain forms of *enactivism* (Noë 2006, 2009, 2012) reject the intentionality of perception, but mainly *relationalism* does so. For relationalism, we have in perception a direct contact to the entities we perceive. Perception has to be analyzed as a relation between a perceiver and the perceived entities. Relationalism denies that perceptual states have a content which may represent some properties in the absence of a relation to objects which have these properties. Perceptual states do not fulfill Chisholm's first criterion for intentionality. These specific challenges to the intentionality of perception will be the main focus of the following chapters.

(3) Challenges to specific theories of perceptual representation: These views do not reject the representational view of perception, but challenge only certain versions of it. It is not denied that perceptual states have content. The intentionality of perception is not rejected, but only certain explanations of that intentionality. Often these challenges are presented as some alternatives to the naturalistic theories of intentionality, given by causal or informational semantics or teleosemantics and their explanation of perceptual (and mental) content. Such alternatives explain intentionality by *normativity* or *phenomenal consciousness* and these are considered irreducible to a naturalistic explanation.

Some philosophers for example reject the naturalistic theories of intentionality, but do not reject the project to attribute content to perceptual states. More specifically, there are positions which consider that a naturalistic theory of intentionality is impossible, given the *normativity* of content (Kripke 1982). It is claimed that normatively cannot be naturalized and that therefore intentional content cannot either.

Another alternative to the theories of naturalized intentionality is the program of *phenomenal intentionality* (Horgan/Tienson, 2002). In this program the intentional content of perception is explained by the phenomenal character of our experience. The attempt to explain content by external causal or historical relations of the mental state is rejected. Theories of *phenomenal intentionality* reject the naturalistic theories of intentionality because they do not explain intentionality through phenomenal states (Kriegel 2013).

As I said, the main focus of the following chapters will be on the challenges addressed to the application of intentionality to perception, i.e. the second type of challenges. The

challenges mentioned in the third point will be partially addressed in the defense of a naturalistic theory of perceptual content presented in chapter four. I mentioned only here the first type of challenges. As the topic of the present dissertation is not a general defense of intentionality, but considers intentionality only insofar as it is applied to perception, I will not address directly the arguments for or against intentional irrealism in the rest of the book but concentrate on the two other challenges.

Chapter 2

Enactivism and Perceptual Content

Introduction

Enactivism defends the view that action is constitutive for perception, more specifically that we cannot have perceptual experiences with content when we lack knowledge about the way our sensory impressions change with our bodily movements. Someone who lacks or who loses such "sensorimotor knowledge" does not have perceptions with content. The main evidence Alva Noë (2004) gives for enactivism are therefore cases where a lack or loss of sensorimotor knowledge disrupts perception despite normal sensory stimulation. These cases of "experiential blindness" are used by enactivists to show that sensorimotor knowledge is a necessary constituent of any perceptual experience, given that in cases where it is absent, we have only confused sensory impressions which are not about any objects or properties in the world. The cases of "experiential blindness" are the central evidence in support of enactivism and need therefore a careful examination in any evaluation of the enactivist theory of perception. I will here focus on this evidence and will show that the empirical cases given by Noë in support of enactivism do not actually show that there is such a phenomenon as "experiential blindness" due to a disruption of sensorimotor knowledge. I will especially focus on the central experiment of the lenses inverting the visual field which is used by Noë to show the existence of such an "experiential blindness". Contrary to Noë, I will claim that in this case sensorimotor knowledge is effectively disrupted, but this does not create a state of "experiential blindness", a perceptual state without any content. It will be my contribution to the literature to establish that the lens experiments, this central evidence given for enactivism, do not support Noë´s view. In the other cases of "experiential blindness" (cataract operations) the failure of normal perceptual experience can be explained by other factors than the lack of sensorimotor knowledge. Given that the examples for "experiential blindness" are not conclusive, the central thesis of enactivism is highly questionable, namely that sensorimotor knowledge is constitutive for perceptual experience and for perceptual content. I will especially emphasize the consequences which follow for an explanation of perceptual content. Enactivism gives an explanation of perceptual content in terms of sensorimotor knowledge. It is the application of that knowledge to sensory impressions which gives content to perceptual experience. If in the cases of disruption of sensorimotor knowledge we continue to have perceptual experiences with content, then that knowledge cannot be a necessary condition for

perceptual content. I claim that in the case of the experiments with inverting lenses, there is such a disruption of sensorimotor knowledge, but at the same time a preservation of perceptual content. The enactivist explanation of perceptual content should therefore be rejected. Content must be explained by something else than sensorimotor knowledge.

I will first present Noë´s enactivism and the cases of "experiential blindness" which are given as empirical support for that position (1), then I will discuss the criticisms which have already been addressed to Noë´s defense of enactivism (2). A special focus will be given to a critical examination of the central case for "experiential blindness": the experiments with inverting and distorting lenses (3). Finally, the consequences of a rejection of enactivism for a theory of perceptual content will be analyzed (4).

1. Enactivism and "Experiential Blindness"

1.1. The Enactive View

The enactive view of perception as it has been exposed by Noë and O´Regan (Noë and O´Regan 2001 and Noë 2004) is an ambitious theory which offers an explanation of the way our perceptual experience acquires content, the way it comes to be about features and objects of our environment. Enactivism is not only a thesis about perceptual content, but also a thesis about the qualitative character of perceptual experience. Two sensory modalities, and also two experiences, are qualitatively alike, if they are submitted to the same sensorimotor laws. Furthermore, enactivism is a thesis about the necessary components which form the supervenience base of perceptual experience: experience is not only based on the neural events in the brain, but also on our bodily activity and our interaction with the world. This is what Noë, following Hurley, calls vehicle externalism (Hurley 1998). Despite this wide scope of enactivism, I will restrict my investigation to implications the enactive view has for a theory of perceptual content.

The enactive approach conceives *perception as an activity*, a form of doing or acting. Perception is described by enactivists as an active exploration of the environment and an interaction with the world. Through bodily movements the perceptual inputs change in a determinate way. When we approach an object, its visual size increases and it also increasingly occludes its background, its shape varies with our orientation and the perspective we have relative to it. When we hear a sound, its loudness (or amplitude) increases when we approach the source of the sound and it gradually covers other sounds in the environment. These regular changes of the visually or aurally perceived properties of the objects when we

move relative to them are called by Noë sensorimotor contingencies or sensorimotor laws. Through our experience, we acquire knowledge about these sensorimotor changes. We know how visual shapes changes when we move in such and such a way. And we use this knowledge about sensorimotor contingencies to guide our behavior. We expect the appearance of objects to change in a definite way with our movements. We can differentiate the appearances which change because we move in a specific way from those which change due to object movement. We use this knowledge and these practical sensorimotor skills about changing appearances to guide our actions and interact with the world in a successful way.

But enactivism does not stop at these phenomenological descriptions of the intricate connection of action and perception. The enactive view goes one step further by claiming that *sensorimotor knowledge* and practical sensorimotor skills are constitutive for perception. We would not have perceptual experience about features of the world (objects and their properties) without that kind of sensorimotor knowledge and these practical skills which guide our interaction with the environment. Our perceptual experience acquires content only through the possession or exercise of sensorimotor knowledge: "All perception, I argue, is intrinsically active. Perceptual experience acquires content thanks to the perceiver´s skillful activity." (Noë 2004: 3). For enactivism, the knowledge and mastery of sensorimotor contingencies are not only required for a coordination of perception with action, but they are a condition of perception and perceptual content. Why this move from the intricate coordination of perception and action in the guidance of behavior to the more radical claim about a constitutive role of sensorimotor knowledge for perception?

We can classify the reasons Noë advances in support of the enactivist view that we have only perception and perceptual content given sensorimotor knowledge into indirect reasons and direct reasons. The indirect reasons argue for enactivism from certain features of perceptual content. The claim is that the enactive view of perception is the best explanation of those features of content. The direct reason for enactivism comes from "experiential blindness", certain empirical phenomena which seem to constrain us to the enactive view. Let us briefly look at the indirect reasons in the next section before turning to the central, direct arguments.

1.2. The Enactive Explanation of Perceptual Content

Noë argues for certain features of perceptual content. Given these features, sensorimotor knowledge would be a plausible explanation of perceptual content. So, the indirect reasons for

enactivism are a sort of inference to the best explanation, given a certain conception of perceptual content. Noë defends the view that perceptual content is conceptual, that there are always two dimensions of perceptual content and that perception has virtual content. If sensorimotor knowledge is constitutive for perception in general, it is much easier to explain the conceptual content, the two-dimensionality of content and virtual content of perception. But all these three positions on perceptual content are controversial and disputed. And all of these positions on perceptual content have been defended independently of enactivism (see McDowell 1996 and Brewer 2005 for conceptual content, Lycan 1995, Chalmers 2004 and Schellenberg 2011a for two-dimensional perceptual content, Merleau-Ponty 1945 and Husserl 1907/1997 for virtual content). Therefore, even if one accepts Noë´s views on perceptual content, it is perfectly plausible to resist enactivism. Let us look closer at the conception of content defended by Noë.

(1) Perception has *conceptual content*: The content of experience cannot derive from sub-personal processes in the brain, because these processes have no "semantic powers". Sub-personal brain processes cannot be about something else. Content can only derive from the conceptual capacities at the personal level (Noë 2004: 28-32). Noë follows here McDowell´s conception that content must be conceptual and that conceptual capacities are situated at the personal level and not at a computational or neurophysiological level (McDowell 1996). This view is strongly opposed to the theories of naturalized intentionality which attribute content to sub-personal states. As sensorimotor knowledge is a conceptual content used in action, itself a personal level capacity, it would be able to explain how perceptual experience can have such a personal level content.

(2) Perceptual content has *two dimensions*: Content is about the way things appear relative to our perspective, the perspectival or relational properties of things, and it is about the intrinsic properties of things, independently of our point of view. When we visually experience a plate, we see its elliptical shape from here (perspectival property) and we see also that it is round (intrinsic property) (Noë 2004: chap. 5). The enactive view could explain how intrinsic properties can be part of perceptual content, because we can experience these properties through the active variation of the perspectival aspects of appearances. Sensorimotor knowledge includes expectations that an object which looks elliptical from here is actually round. Perception as an exploratory activity and sensorimotor knowledge could explain how experience is about intrinsic properties without rejecting the perspectival properties of appearances.

(3) Perception has *virtual content*: Noë defends the view that we do not only perceive

the parts of objects which affect us causally in the actual moment, but we experience perceptually also the hidden or occluded parts of visible objects or the untouched parts of an object we touch. This virtual presence of some aspects of the object is part of the virtual content. The experiments on inattentional blindness and change blindness show also, that we do not attend to large parts of the phenomena in our visual field. Still we have the perceptual feeling of the presence of a continuous and detailed scene in font of us. This perceptual presence of the whole scene is explained by the virtual content of perception (Noë 2004: chap. 2). The expectations of sensorimotor knowledge can explain perceptual presence and virtual content.

But sensorimotor knowledge is just one possible explanation among others for these types of perceptual content. Noë needs another independent argument for enactivism, and he gives it with the phenomenon of "experiential blindness".

1.3. "Experiential Blindness"

Enactivism would gain strong support from cases where perception is disrupted because of a lack or loss of sensorimotor knowledge. This would be an argument for the view that sensorimotor knowledge is a necessary condition of perception. Noë claims we can find such cases of impairment of vision and calls such phenomena "experiential blindness". Let us see first what that phenomenon is and then see how it supports enactivism. In this chapter, I do not want to contest that phenomenon per se: there may be cases of "experiential blindness". I just want to show that "experiential blindness" does not occur due to a disruption of sensorimotor skills or knowledge. Therefore I claim that we cannot find cases of "experiential blindness" which support enactivism.

Noë introduces the term of "experiential blindness" to describe empirical cases, where people do not see properly although they have normally functioning visual organs, normal stimulation of their sensory receptors and normal sensations. A damage to retinal receptors, visual organs or a damage to areas of sensory processing in the brain would be cases of "normal" blindness. "Experiential blindness" is different. In these cases, people have sensory impressions, or sensations, but no perceptual experience of objects or features of the world. What they sense and feel has no perceptual content. These cases of "experiential blindness" can be used to show that sensory stimulation is not sufficient for perception and that perception has another necessary component. A case of "experiential blindness" mentioned by

Noë is the phenomenon of "Ganzfeld" (Noë 2004: 4 but first described by Metzger 1930).[20] In the experience of a Ganzfeld, one sees only a homogeneous quality, for example the white color of a dense fog, without seeing any objects and without the capacity to distinguish between different features in the visual field. Such an experience is not very different from the experience with closed eyes. One can only see vaguely the different levels of illumination falling on the eye-lids.[21] The experience of a Ganzfeld can be called a case of "experiential blindness", given that vision is not impaired by any sensory damages or malfunctioning. Still it is questionable if "experiential blindness" means an absence of perceptual content and if in the Ganzfeld experience "visual impressions (…) are bleached of content" (Noë 2004: 4). It is plausible to say that in the Ganzfeld our experience still has content, but just little content: one property situated in our close environment. But I do not want here to reject "experiential blindness" on the basis that we cannot have experiences or sensory impressions without content, an argument that representationalists about the phenomenal character of experience would use (Dretske 1995, Lycan 1996, Tye 1995). So, let us admit that there are cases of "experiential blindness" where perceptual content is dramatically reduced or absent, in a way analogous to blindness. We could find other cases of experiential blindness, for example in a specific form of synaesthesia where hearing sounds causes an intense experience of color. Some of these synesthets are declared legally blind, because in noisy traffic, they see a mixture of colors which disables them to see the road and the traffic.[22] These synesthets have no impaired visual organs and they have perfectly normal vision in quiet environments. Perhaps there are similar cases of "experiential blindness" in the experience of strong vertigo or the abuse of narcotic substances.

How does "experiential blindness" support enactivism? The mentioned cases of "experiential blindness" just show that visual stimulation is not sufficient for seeing objects and features of the world. But enactivism would be supported by cases where "experiential blindness" is specifically due to a lack of sensorimotor knowledge. Noë´s evidence for the enactive view is based on experiments where this seems to be the case. But even if such cases are admitted, we can still resist the claim that sensorimotor knowledge is *constitutive* for

[20] "Ganzfeld" means *total field* or *whole field* in German and refers to experiences where the whole visual field seems one continuous, undifferentiated visual quality.

[21] Many people experience an undifferentiated and continuous visual field of grey or black, when they close their eyes. That would be an experience of a Ganzfeld. It is actually quite difficult to know what we really experience with closed eyes, see Schwitzgebel (2011: chap. 8).

[22] This case of synaesthesia was described by Berit Brogaard in a talk given at a Workshop on Synaesthesia at New York University in November 2010. The title of her talk was: "Does color synaesthesia differ phenomenally from visual imagery?"

perception and just admit that it is a *necessary cause* for having perceptions.[23] Aizawa (Aizawa 2007 and Adams/Aizawa 2010) emphasizes this point, because he wants essentially to contest the extended mind thesis and the possible consequence from enactivism that perception is constituted by bodily sensorimotor skills. If Noë can show that a lack of sensorimotor knowledge and skill has "experiential blindness" as consequence, this would just show that this kind of knowledge and skill is a necessary cause of perception. It is another question whether sensorimotor knowledge is only a necessary cause or also a constitutive component of perception. But at least Noë would support a part of enactivism which says that there is no perception without these forms of practical skills and knowledge.

1.4. Types of Blindness

"Experiential blindness" is a special case of lack of visual capacities. It is special in its phenomenology and it is special in its etiology, in the causes which explain it. Concerning the phenomenology, Noë has to show that "experiential blindness" is quite similar to other cases of blindness in order to support the claim that it is actually a case of impairment of vision. Concerning the etiology, Noë has to show that this impairment is caused specifically by a lack of sensorimotor knowledge. Two questions need to be asked in order to explain the phenomenology of "experiential blindness" and to evaluate if it actually exists. First, which types of blindness are there and is "experiential blindness" similar to one of these types. Second, what is the relation of blindness to knowledge? Especially, can we be blinded by a loss of knowledge, of practical know-how or of conceptual capacities? I will address the first question in this section and turn in the next section to the second question.

Loosely speaking, we could say that we are blind when we do not see. If we define "seeing" by accurate or veridical visual experience, seeing something when it is actually there, then we would not see in the case of visual illusions or visual hallucinations. In these cases we have a visual experience, things appear to us a certain way, they look some way to us, but the appearances are not accurate. In both cases we have visual experiences and therefore visual perception. When we are not seeing, because we have visual illusions or hallucinations, then this is not a case of blindness. Visual experience often fails and produces inaccurate visual experience. These failures of vision are not cases of blindness. Blindness is characterized by an absence of phenomenal experience or a reduced form of visual experience. Seeing can fail when we seem to see an object or property which is not actually

[23] Besides Aizawa, Prinz (2006: 6) makes also this point.

there in the world. Blindness is different. It is not deceptive vision, but a lack of vision. Blind people lack information about what is there in the world. Like for any disability, disease or impairment, blindness is a normative notion. It is also a gradual notion. You are blind if your visual system or some connected mental capacity (consciousness, attention) does not function normally and you are blind to a certain degree and at a certain level of impairment.[24]

Blindess is not a unitary phenomenon. There are many different *types of blindness*. They can be distinguished by the type of phenomenal experience one has or by their cause. Let us start with the way it is like to be blind. Only 10% of people recognized as blind have no visual experience at all. They see nothing, cannot detect light and get no visual information. They are affected by total blindness, but the great majority of blind people have some visual experience (partial blindness). Partial blindness can affect only some visual properties (color, movement), or the whole or parts of the visual field. In both cases phenomenal experience is impoverished. When some properties normally detected by visual perception cannot be seen, the person may be color blind (achromotopsia), blind to movement (akinetopsia) or unable to see depth. This kind of blindness affects only certain properties of visual experience and lets the others intact. In color blindness one cannot see certain colors or sees no colors (except different grades of gray), but still sees objects, their movement, orientation or distance. Blindness can also affect some parts of the visual field. In strokes, people can lose their capacity to see in their left visual field (hemianopsia), glaucomas or cataract can obstruct vision in some areas of the visual field. In these cases, there is no vision in parts of the visual field, but normal vision in other parts. But parts of the visual field can also be affected by degraded vision, some parts in the visual field are blurred. This is the case in long- or short-sightedness or in a beginning obstruction of light in the lens through cataracts. A third type of partial blindness, besides impairment of certain visual properties or impairment of certain parts of the visual field, is the impairment of visual integration. In form agnosia or in apperceptive agnosia, people can see colors, movements, distances and edges, but they cannot integrate that visual information in order to see shapes and objects. They are for example incapable to draw what they are seeing. Here, basic visual properties (color, movement, edges) are not affected and no part of the visual field is impaired, but higher visual processing is defective.

Is “experiential blindness” similar to the phenomenal experience of these types of

[24] To define blindness, the World Health Organization draws a conventional line at a certain level of visual impairment: A person is blind if her visual acuity in seeing an object at 6 meters is less than normal visual acuity for seeing an object at 120 meters, or if the visual field covers an angle of less than 10^{o} (normal visual field has 180^{o}).

blindness. It is no objection against cases of “experiential blindness” that these are not cases of total blindness. Most cases of blindness are partial and preserve some reduced or rudimentary form of visual experience. Enactivism does not predict that with the disruption of sensorimotor knowledge total blindness would follow. But “experiential blindness” should be at least comparable to the phenomenal experience of some type of partial blindness. It could either be a visual experience with poor phenomenal experience similar to the first type of partial blindness, lacking some or many of the visual properties normally detected in vision. This seems to be the case in the experience of a “Ganzfeld”. Or “experiential blindness” could be a rich visual experience, but where the visual information is not integrated in the right way, similar to the third type of partial blindness, where colors and movements are seen but no forms or objects. This may be similar to the experience after cataract operations.

Besides a visual phenomenology similar to the defective vision in blindness, Noë gives a further criterion for “experiential blindness”. It is phenomenal experience without representational content. In total blindness, obviously, nothing is represented visually, because there is no visual information at all. But in all cases of partial blindness, there are not just phenomenal experiences which are about nothing. In very poor visual experience, the environment is represented as having only some properties. If a blind person is only able to see different levels of brightness, for example, the environment is represented as being brighter in one part of the visual field than in other parts. As in the experience of a Ganzfeld, there is little content, but not an absence of content. Similarly in the cases of blindness through lack of visual integration, the people represent movements, colored surfaces and edges in their environment, even if they do not represent whole objects. There are cases of representational visual content without phenomenal experience, for ex. in blindsight. But it seems that there is no case of partial blindness, i.e. some visual experience, without representational content. One could reject “experiential blindness” on the basis that there is no contentless visual experience in any kind of blindness or on the basis that we cannot have sensory impressions without content, an argument that representationlists about conscious experience would use (Dretske 1995, Lycan 1996, Tye 1995). I do not find this argument decisive against “experiential blindness”.

First, Noë himself rejects the arguments given in Peacocke (1983) for anti-representationalism, that is, for the existence of sensational content in experience which does not represent. Noë defends the view that all appearances are about some perspectival properties of the environment and rejects that they are non-representational properties of experience (Noë 2004: 82-4). Secondly, it is possible to interpret “experiential blindness” as

cases where content is degraded and impoverished but not absent. In a Ganzfeld, we are blind, because we have very little content, not because we have sensations with no content. Thirdly, Noë´s claim that there is no content in "experiential blindness" can just mean that with the disruption of sensorimotor knowledge the corresponding perceptual content *and* phenomenal experience disappears. As this disruption is always partial, the corresponding blindness is partial; some experience and content is still present. If we have still some visual experience in "experiential blindness" this is because there still is some sensorimotor knowledge and perceptual content which is preserved. If *all* sensorimotor knowledge were disrupted, then we would have a completely undifferentiated experience similar to total blindness. If it is possible to differentiate between properties, for example darker/brighter, then some sensorimotor knowledge and some content is still present. On this interpretation "experiential blindness" can neither be rejected with arguments from representationalism, nor because all partial blindness seems to have some perceptual content.

Given the phenomenology of blindness, it seems perfectly reasonable to accept that there is something like "experiential blindness". But "experiential blindness" is not only characterized by a phenomenal experience similar to that of the usual cases of blindness. It is also characterized by a certain etiology of blindness. "Experiential blindness" is due to a loss of practical knowledge or know-how. Or all the previously discussed four types of blindness (total blindness and the three cases of partial blindness) are due to damages to the crystalline lense of the eye, to the receptors of the retina, to the visual nerves or to the visual cortex. The four types of blindness are explained by damage to the visual system, not by a lack of cognitive processing outside of the visual system.

There are cases of blindness with a similar phenomenology than the previously discussed ones, but with a different etiology. Blindness can be due to a lack of consciousness or a lack of attention, while the visual receptors and the visual cortex are not damaged. Blindness in half of the visual field can be due to damage to the visual cortex or to a neglect of the visual information received from this part of the visual field (hemineglect). Such patients pay no attention to one part of their visual field and have no conscious experience about that part although sensory processing is normal (Palmer 1999: 563). Cases similar to the third type of partial blindness, visual impairment by a lack of visual integration, can be caused by a disturbance of attentional processes while sensory processing remains intact. This is the case in the Balint syndrome. Patients with this syndrome cannot shift their attention from one object to the next or from one part of an object to another part. Their gaze and their attention remains fixed to one object in their visual field and all things which surround that object

disappear from their visual experience. They have strong problems to disengage their attention from that object and move it to something else. In one case of the Balint syndrome, when a drawing of two unconnected lines is shown, the patient saw only one line and could not consciously experience the other line next to it. (Holmes/Horax 1919, also Palmer 1999: 566). In this syndrome, the world decomposes into unconnected details. This syndrome which affects attention has similar effects as the blindness in apperceptive or integrative agnosia, where patients cannot integrate edges into forms and objects or objects into scenes (Humphreys 1999)[25]. Can we be blinded because we lack some knowledge or some concepts as enactivism claims? I do not think that there are such cases of blindness and if enactivism can establish "experiential blindness", that would be a new type of blindness, not because of its phenomenology, but because of its etiology.

1.5. Blindness and Knowledge

When we consider the causes of blindness, than people can be blind because their visual system is damaged (eye or visual cortex), they can be blind, given a normal visual system, when they lack consciousness or when their attention is impaired. "Experiential blindness" goes one step further by claiming that we can be blind because we lack a certain type of knowledge or because we lack certain concepts. Noë is inspired here by the Kantian claim that without concepts we are blind (Kant 1781/1992: 98, B51 and B75), cited by Noë in support of "experiential blindness" (Noë 2004: 9). It seems difficult to support that view by clinical cases of blindness. And it is clearly the ambition of enactivism to find such clinical cases with "experiential blindness".

The claim that there can be *blindness by lack of knowledge or concepts* does not find any correspondent in the recognized types of blindness. We have to distinguish blindness, lack of vision, from impairments where visual perception is present, but cannot be used by other cognitive capacities or by action. It can be sometimes difficult to distinguish these cases from blindness. When people pump into objects, it may be that they cannot see them, or it may be that they cannot use the visual information to guide their bodily movements. If people cannot use their knowledge and exercise their conceptual abilities by recognizing, naming or

[25] Integrative agnosia was distinguished by Humphreys and Riddoch (1987) from appercetive agnosia, because in integrative agnosia, contrary to apperceptive agnosia, the patients are still able to draw what they see. But for them drawing is a painfully long process where they slowly align one edge after the other to form the whole image of an object. They cannot integrate the details and edges of an object into the visual experience of a whole object within one gaze. Apperceptive and integrative agnosias are impairments of the visual cortex, contrary to the Balint syndrome.

categorizing objects, it can be because they just do not see the objects, or it can be that they cannot apply their knowledge or concepts.

It has been the task of psychology and the neurosciences to disambiguate cases of blindness from the cases where intact visual perception cannot be used by and integrated with action and cognition. Blindness is distinguished from visual ataxia and associative visual agnosia. Patients with visual ataxia cannot use visual perception to guide their movements, but they can recognize and name the objects around them. They can give perfectly satisfying verbal reports about their visual experience (Milner/Goodale 1995/2006). In associative agnosia, people cannot recognize the objects they see and they cannot name them (Humphreys 1999). This means that they cannot use their lexical concepts (names) in relation to their visual experience. Nor can they use other types of concepts (for ex. prototypes or exemplars) to recognize what they are seeing. They may still have these concepts or they may lose them, as it is the case for example for the lexical concepts in strokes which affect the language centers. Are they blinded by their lack of concepts or their incapacity to apply them to experience? No. Associative agnosias are generally diagnosed by the fact that patients can give an accurate drawing of what they see but cannot name or recognize what they see. They can report their visual experience, although they cannot name or describe it. Given these cases, we have to distinguish blindness from the inability to use accurately visual information in cognition or action. I am not aware of other cases than those given by Noë in his description of "experiential blindness", where a disruption of knowledge or conceptual capacities seems to generate blindness. The heavier the burden of proof lies on the cases of "experiential blindness" and the more careful these cases have to be evaluated.

The difference of the previously discussed examples from "experiential knowledge" may be that this kind of blindness depends on a special type of knowledge: sensorimotor knowledge. Noë says that sensorimotor knowledge consists of practical abilities and is not propositional (Noë 2004: 117f.). But it is also conceptual: it consists in the possession and exercise of "sensorimotor `concepts´" (Noë 2004: 183). He also says that there is no sharp division between concepts and experiences. So, sensorimotor knowledge does not consist in having certain propositions expressed by lexical concepts, but of conceptual abilities where the concepts are of a simpler form than the ones we use in sentences to express propositions. Enactivism does not claim that a loss of names and lexical concepts causes blindness and it does not claim that animals or infants do not see, because they do not have these kinds of concepts and do not have propositional knowledge. But given the conceptual skills constitutive of sensorimotor knowledge, does a loss of such kind of knowledge imply

blindness? That is what enactivism claims with its examples of “experiential blindness”. Does “experiential blindness” add a new type of blindness or are the cases given by enactivism just reducible to the known forms of blindness, where blindness is not due to loss of knowledge and conceptual capacities? Before I examine this question in the rest of the paper, some terminological ambiguities concerning sensorimotor knowledge have still to be cleared.

It has been criticized that the terms “sensorimotor knowledge” and “skill” are ambiguous in several respects. Does enactivism claim that we must actually *exercise* this practical knowledge and these skills, or is it sufficient that we just *possess* this knowledge and these skills in order to see (Block 2005, Clark 2006, Prinz 2006)? Noë defends an embodied view of perception and this implies that the body (beyond the head), and possibly parts of the world, are constitutive components of perception. To defend vehicle externalism, Noë needs to affirm that some actual bodily activity is part of perception. But a *weaker version* of enactivism can claim that for perception we need only to *possess* sensorimotor knowledge and skills, which are possibly only realized in the brain. This weaker version can still affirm that bodily activity is necessary to acquire such knowledge and skills. But once this sensorimotor knowledge is acquired, it can be used without bodily movements. This weaker version is actually implied by Noë´s discussion of paralysis and optical ataxia (Noë 2004: 12-13). These impairments do not impair perception. People who cannot move, can still have the knowledge, practical understanding and skills necessary for perception. People who cannot use perceptual information to orient their bodily behavior (optical ataxia) still have acquired sensorimotor knowledge before their impairment and continue to use it now. For these reasons, I do not believe that Aizawa´s examples of paralysis and of anaesthetized patients who have perceptual experiences during their operations are counter-examples to enactivism (Aizawa 2007). As Aizawa is mainly interested to reject the view that perception is necessarily embodied (vehicle externalism), he needs to start from a stronger version of enactivism which does implies vehicle externalism. Aizawa supposes that sensorimotor skill is not only an understanding of sensorimotor contingencies but a “capacity to perform” (Aizawa 2007: 10). We use here the weaker version which just says that sensorimotor knowledge and understanding are necessary for perception, even when some bodily activity using that knowledge is impaired.

But enactivism requires that the sensorimotor knowledge is actually present although the bodily activity could just have played a role in the past acquisition of that knowledge. It is not sufficient that sensorimotor knowledge just has played a role in establishing perceptual capacities in the past. Noë affirms that whenever that knowledge is lost, the corresponding

perceptual capacity and perceptual content disappears. So it must actually be present.

1.6. Empirical Evidence for "Experiential Blindness"

What are the cases of "experiential blindness" in support of Noë´s position? Mainly two cases: (1) the visual experience of cataract patients just after the operation and removal of their cataract. (2) the visual experience of people after putting on lenses which distort or reverse the visual field. Both cases are classified by Noë as "experiential blindness" and in these cases sensorimotor knowledge is either lacking (the cataract case), cannot be applied or is disrupted (the lens case). Noë claims in both cases that perception is disrupted, a case of blindness, because sensorimotor knowledge is missing or disrupted. Our experience loses perceptual content. Noë says therefore: "Taken together the two examples make a strong case for experiential blindness, and so for the enactive approach." (Noë 2004: 7). Let us have a closer look at these two examples.

(1) Cataracts are obstructions of the crystalline lens of the human eye and can be present from birth. Cataracts are not an impairment of the retinal receptors which may be normal in such blindness; they only obstruct the passage of light through the eye´s lens. In cases of congenital blindness from cataracts, the removal of the cataract creates a situation of "experiential blindness", so Noë (Noë 2004: 4-5). Obviously, congenitally blind cataract patients could not develop visuomotor knowledge or skills. The sensory impressions they receive after the operation cannot be integrated with any such knowledge. Noë claims that the sense of confusion created by the new visual impressions on operated patients is due to a lack of sensorimotor knowledge although their sensory stimulation is normal. As one example for the sense of visual confusion, Noë cites the report of a patient (Virgil), given by Oliver Sacks (1995):

> "Virgil told me later that in the first moment he had no idea what he was seeing. There was light, there was movement, there was color, all mixed up, all meaningless, a blur. Then out of the blur came a voice that said, "Well?" Then, and only then, he said, did he finally realize that this chaos of light and shadow was a face—and, indeed, the face of his surgeon" (Sacks 1995: 114)[26]

This confusion of colors and movements is perhaps similar to the experience of the mentioned synesthets or to the visual experience at the moment of a strong vertigo and in that sense it can be classified as blindness despite normal visual stimulation. But in the next section, I will

[26] Cited by Noë (2004: 5).

discuss reasons which cast strong doubts on the view that we have here a case of "experiential blindness". There is strong empirical evidence that the visual stimulation after removal of the cataract is in no way *normal* in the case of congenital cataracts (Aizawa 2007, Adams/Aizawa 2010).

(2) Similar phenomenological reports about confused visual impression are cited by Noë from experiments where the visual projection on the retina is displaced and distorted by prism spectacles. He cites the report about the disruptive effect on visual perception after putting on these lenses, given in Kohler (1951/1964): "I felt as if I were living in a topsy-turvy world of houses crashing down on you, of heaving roads, and jellylike people."[27] For Noë, these lenses have an effect of perceptual confusion and "experimental blindness" similar to the cataract operation case. Noë supposes that goggles with a right-left reversion of the visual image have comparable disrupting effects and cause "experiential blindness". In these lense cases, sensorimotor knowledge is also partially disrupted. Objects move and transform in a strange way and we cannot use our learned expectations about their spatial location. The sensorimotor knowledge cannot be used to guide behavior and the acquired sensorimotor skills disrupt. So, is this a case of "experimental blindness" due to a lack of sensorimotor knowledge? In section 3, I will deny that the lense experiments are cases of "experimental blindness", although sensorimotor knowledge is effectively partially disrupted.

2. Criticisms of Enactivism

The large attention received by Noë´s *Action in Perception* was followed by extensive critical reactions to the book. The criticisms are diverse, but can be grouped into three categories: (1) concerning his theory of perceptual content and qualitative character based on enactivism (2) the philosophical consequences Noë draws from enactivism, and (3) the empirical evidence for or against enactivism. I will mainly focus on the third point after briefly mentioning the other two.

(1) The reduced role of inner representations in perception and the role of virtual content has been criticized (Block 2005, Prinz 2006, Jacob 2008, Nanay 2012) as well as Noë´s defense of conceptual content (Jacob 2006, Prinz 2006) and the two dimensionality of perceptual content (Siewert 2006, Campbell 2008, Martin 2008, Kelly 2008).

(2) The radical consequences Noë draws from enactivism about intentionality and externalism have been questioned, especially the claim that enactivism implies a rejection of

[27] Cited in Noë (2004: 8). The original German quote is in Kohler (1951: 43).

intentionality and of representational content (Lycan 2006). The claim that enactivism implies vehicle externalism has also been extensively criticized (Prinz 2006, Aizawa 2007, Adams/Aizawa 2010). Mainly, it has been criticized that even if bodily activity and skills are a necessary condition of perception, this does not imply vehicle externalism, namely the thesis that bodily activity is constitutive for perception rather than just a necessary cause of perception.

(3) Concerning the evidence for enactivism, there is an internal criticism which contests that the empirical evidence given for enactivism actually supports the burden of proof (Aizawa 2007, Prinz 2006). And there is an external criticism which confronts enactivism with empirical evidence in contradiction with it. A special focus was given to the difficulties to square the enactive view with the largely accepted neurophysiological evidence for two separate streams of visual processing (dorsal/ventral stream as described in Goodale/Milner, 1995/2006), (Goodale 2001, Block 2005, Clark 2006, Prinz 2006, Jacob 2008). I will focus here on point (3) because it is essential to establish the enactive claim first. Especially I will examine the internal criticism of Noë´s evidence as developed by Prinz (2006) and Aizawa (2007). Both criticize Noë´s examples for "experiential blindness" and the implications Noë draws from them.

Let us now turn to the criticism of Noë´s evidence for "experiential blindness" (in Aizawa 2007, Adams/Aizawa 2010 and Prinz 2006). It is essential for enactivism to show that "experiential blindness" is explained by a breakdown of sensorimotor knowledge, by "abnormal sensorimotor integration" and not by "abnormal *sensations*" (Noë 2004: 6). *Abnormal* sensations causing a state of blindness just show that seeing requires *normal* sensations, not that it requires sensorimotor knowledge or integration. Aizawa (2007) shows that this condition cannot be met by the example of post-operated cataract patients. There is ample empirical evidence that congenital cataracts not only obstruct the passage of light, but also prevent a normal development of sensory receptors and basic sensory processing. Aizawa draws on the research on the effects of cataracts which shows that even after the operation "patients suffer deficits in grating acuity, spatial contrast sensitivity, temporal contrast sensitivity, peripheral vision, stereo acuity, perception of global form, and perception of global motion" (Aizawa 2007: 13).[28] Developmental studies on cats which have been raised from birth with sutured eye-lids show that basic sensory processing develops abnormally when visual stimulation is prevented. When the suture is removed, the cats show fewer cells which respond to normal stimuli, cells have abnormal receptive fields, the inhibitory

[28] See the footnote given by Aizawa after this quote for the extensive neurophysiological literature on these sensory deficits in congenital cataract patients.

capacities of cells which are necessary for edge detection are impaired, motion detection by cortical cells is weaker and the use of binocular disparity (an essential depth cue) is lost (Aizawa 2007: 14). From this research we can conclude that the poor visual capacities of patients after a cataract operation are at least partially due to deficits in sensory receptors and processing. The cataract example does not give a clear case for the claim that the deficits in sensorimotor knowledge and integration explain the phenomenal experience of blindness. The confused visual experience described by patients like the experience of Virgil cited by Sacks and Noë can be due to poor sensory processing. And given the research just mentioned, it is very probable that poor sensory processing explains their unusual visual experience.

The cataract case has another inconvenience. Operated cataract patients had no or almost no experience of the visual modality before their operation.[29] They do not know what seeing is like. The described confusion can be due to the shock of a totally new quality of experience and the complete lack of past experience with these visual impressions. The visual experience needs not be very different from ours to create a sense of confusion in the patients. Furthermore, post-operated patients have no capacities to recognize and conceptually classify what they see. In the quoted report, the patient Virgil has therefore to use the aural modality, the voice of the doctor, to recognize the doctor´s face. The confusion described by Virgil can be driven by the incapacity to recognize what he visually experiences. When Virgil reports that colors and movements seemed "all meaningless, a blur", this may be interpreted as his incapacity to recognize what he sees. The reports of the first impressions of cataract patients are difficult to interpret and when a patient speaks of "a blur" that cannot be taken in the same sense as when we use such descriptive terms. We cannot take this description as a phenomenological report about an indistinguishable mix of sensory impressions similar to a state of blindness.

The confusion in the experience of operated patients can be explained by deficits in sensory processing or by the shock and strangeness of the experience of a new perceptual modality. Both of these explanations of blindness have nothing to do with sensorimotor knowledge. Furthermore the phenomenal reports of patients have to be taken with caution and are unreliable. For these reasons the classification of this experience as a case of "experiential blindness" is quite speculative. And even if it is a case of blindness, there are strong reasons to believe that it is caused by something else than the lack of visuomotor knowledge of the patients.

[29] In cases of congenital cataracts, the cataracts can still let light pass through the lense, given that cataracts become gradually more opaque after birth. The neonates can have some weeks of visual experience before losing their capacity to see with the increasing opacity of the cataract.

Noë concedes the weakness of the cataract example given that the blindness in this case could be caused by "abnormal sensations" (see Noë 2004: 6-7). He thinks that only the lense experiment together with the previous example can establish "experiential blindness" through loss of sensorimotor knowledge. Indeed in the lens experiments, the deficits of sensory receptors and processing can be excluded. And the difficulty to interpret phenomenal reports disappears also, given that the subjects wearing the lenses had normal visual experience and normal capacities to deal with that modality. Despite these better initial conditions, I think the lens case also fails to establish "experiential blindness" and enactivism. It is my specific contribution to the criticisms addressed to enactivism to show that the main evidence for the enactive view, the lens experiments, does not support that view.

3. An Inverted and Distorted Visual World

3.1 "Experiential Blindness" in Lens Experiments

Lenses which change in a systematic way the visual input to the retina have been used since Helmholtz to test our capacity to adapt to such visual changes. Helmholtz diverted the visual field with lenses by 11^{o} degrees to one side and showed that subjects can rapidly adapt their reaching behavior to the displaced visual world (Helmholtz 1867, see also Palmer 1999: 344-45). George M. Stratton, a student of Wilhelm Wundt, reversed the projected image on the retina upside-down through prismatic lenses to test the adaptation to so-called upright vision (Stratton 1896 and 1897). As in Helmholtz´s experiment, Stratton showed a relatively rapid motor adaptation, i.e. bodily movements are changed in such a way that the unusual and non-veridical visual information can be used again for walking, reaching and other behavioral tasks. But he showed also that after a longer period of uninterrupted use of the lenses, the reversed visual world seems "normal" again. The visual experience which conflicted with tactile, auditory and proprioceptive experience seemed to be again in harmony with the other senses. There has been perceptual adaptation: either vision adapted to the other senses or the other senses to vision. Numerous lens experiments have followed with displacements, inversions and distortions of the visual input (reviewed in Kohler 1951, Taylor 1962). The experiments showed generally motor adaptation, but the question of perceptual adaptation, whether and to which degree visual experience itself changes with longer use of the lenses, is still disputed (Harris 1965, Linden et al. 1999).

How can these experiments help to establish "experiential blindness"? And how can they show that blindness is actually explained by a disruption of sensorimotor knowledge and

skills? Let us remember under which conditions it can be shown that blindness is due to the absence of sensorimotor knowledge: If sensorimotor knowledge is absent, disrupted or lost (first condition) *given normal sensory processing and "normal" sensations* (second condition), then a phenomenology similar to blindness or to a qualitative experience without content can be attributed to (and explained by) the absence of sensorimotor knowledge. Under these conditions it can be defended that sensorimotor knowledge plays an important or essential role in perception and for having perceptual content. The cataract example failed, because it did not meet the second condition.

Now, what are the examples for "experiential blindness" in the case of the lens experiments? In *Action in Perception*, Noë uses essentially two lens experiments: the experiment where the input is reversed right to left and another series of experiment by Kohler with displacing and distorting lenses (Kohler calls them "prism experiments", Kohler (1951: 20-28))[30]. It is important to keep these two experiments apart, because they have quite different effects which are sometimes confused in the literature. I will show in the following pages, that the inverting goggle experiments are a cases of disrupted sensorimotor knowledge while sensations are normal, but they do not show any phenomenology of "blindness". While in the "prism experiments" there is some phenomenology of confused, chaotic perception, but we cannot attribute that phenomenology to the disruption of sensorimotor knowledge. The "prism experiment" does not clearly meet the second condition about "normal" sensation. And the inverted lenses are not a case of "blindness".

Let us look first at *the "prism experiment"* with the distorting lenses, because Noë uses the phenomenological report of the subject, K, wearing these lenses as his main example for "experiential blindness" in his book.[31] I quote entirely the phenomenal report of K used by Noë (2004: 8). The report describes the experience just after putting on the goggles:

> "During visual fixations, every movement of my head gives rise to the most unexpected and peculiar transformations of objects in the visual field. The most familiar forms seem to dissolve and reintegrate in ways never before seen. At times, parts of figures run together, the spaces between disappearing from view: at other times, they run apart, as if intent on deceiving the observer. Countless times I was fooled by these extreme distortions and taken by surprise when a wall, for instance, suddenly appeared to slant down to the road, when a truck I was following with my eyes started to bend,

[30] Kohler´s experiments with right-left inversion or up-down inversion were not done with prism lenses, but with a system of mirrors in goggles, while only the displacing and distorting goggles involved prisms.

[31] Although Noë used already the inverting lens experiments of Stratton and Kohler (up-down inversion and right-left inversion) in Noë/O´Regan (2001) to support the „sensorimotor account of vision" and in Hurley/Noë (2003) as argument for neural plasticity, he introduces the idea of „experiential blindness" only in *Action in Perception* (2004).

> when the road began to arch like a wave, when houses and trees seemed to topple down, and so forth. I felt as if I were living in a topsy-turvy world of houses crashing down on you, of heaving roads, and of jellylike people." (Kohler 1951/1964: 43)

Noë comments on K´s report, saying that "his visual world is distorted, made unpredictable and topsy-turvy. To this extent, K suffers blindness" (Noë 2004: 8).

Concerning the other experiment with *the right-left inverting goggles*, Noë supposes a similar disruptive effect after putting on the goggles. He writes: "When you put on inverting lenses, you experience not an inversion of content, but a disruption or disorganization of content. (…) this "experiential blindness" is to be expected from the enactivist standpoint" (Noë 2004: 91). Noë supposes that in both types of experiments, putting on the spectacles creates a disruption of perception and perceptual content. In both cases, the immediate effect of wearing the spectacles is "experiential blindness" and a loss of content. Content is only restored with motor adaptation, only when we develop a new sensorimotor knowledge adapted to the changed and disturbing stimulation.

How plausible is the claim that the lens experiments are cases of "experiential blindness"? Aizawa, commenting on K´s report, thinks that the experiment is effectively a case of "experiential blindness", not vulnerable to the objections of the cataract case (Aizawa 2007: 17). Lycan, referring to the same report, is skeptical that wearing the goggles causes a loss of perceptual content. He remarks that K´s entire report is formulated in representational terms, not in a vocabulary of sensory impressions without content (Lycan 2006: 11). Prinz rejects that there is "experiential blindness" in the case of inverting goggles (Prinz 2006). I think, we cannot find a clear answer to these questions as long as we follow Noë´s tendency to treat both lens experiments on a par, a tendency often followed by his critics Aizawa and Prinz.

Before we look at the distinctive features of the inversion experiment and the "prism experiment", some general clarifications concerning both experiments are necessary. Effectively, in both experiments the spectacles cause a radical change of the sensorimotor contingencies (or laws). Normally, when I move toward an object, its apparent size increases and it seems closer to me. With the right to left inversion spectacles, when I approach the object seen on my left, its size decreases and it appears to get away from me, given that my move to the left increases the distance between me and the real location of the object on my right. And with the distortions in the "prism experiment", movements change the apparent

shape of the objects in unusual ways.[32] Because the sensorimotor contingencies are changed, I cannot use or apply my past sensorimotor knowledge and I cannot use the expectations based on that knowledge. I expect the objects to increase in apparent size when I approach and my expectations are deceived. I expect a cubical form to still appear cubical when I turn my head slightly, and my expectation is deceived again. And in both experiments, I cannot use my sensorimotor knowledge to guide my behavior. As expectations are constantly deceived and behavior fails, the sensorimotor knowledge has to be abandoned or disrupted. So, the lens experiments are a clear case of changed sensorimotor contingencies and a clear case of the disruption of sensorimotor knowledge.

But the spectacles do not disrupt *all* sensorimotor knowledge, therefore we cannot expect, and Noë does not, that total blindness follows from wearing them. As sensorimotor knowledge is only partially disrupted, only partial blindness should follow. On the enactive view, only the perceptual content relative to specific disrupted sensorimotor knowledge disappears. With the right to left inversion, only some parts of spatial content are expected to be disrupted. This is also Noë´s response to the obvious objection that in K´s report on the "topsy-turvy world", he continues to see trucks and trees and therefore does not lose perceptual content. Given that the distorting lenses disrupt only *some* sensorimotor knowledge, only *some* content is affected. But in this case, Noë still should show that some content is effectively affected. Lycan´s objection that nothing in the report is phrased in non-representational terms is therefore still a problem for enactivism, because it suggests that *no* content is disrupted.

Furthermore, although the spectacles only partially disrupt sensorimotor knowledge, the enactivist claim is still that a complete disruption of sensorimotor knowledge would lead to experience with no content at all. It is incompatible with the enactivist view to suppose, as Aizawa does, that "experiential blindness" is only a partial blindness, like achromotopsia (blindness to colors) or akinetopsia (blindness to movements) (Aizawa 2007: 17). It is not as if "experiential blindness" would only disrupt some "sensorimotor" part of perceptual content and leave other aspects of perceptual content unaffected, for ex. color. This misinterpretation of enactivism is one reason, why Aizawa concedes that the lens experiments show "experiential blindness". On the enactive view, sensorimotor knowledge is constitutive for all perceptual content: no knowledge, no perceptual content *at all*. But, in order to defend enactivism, it is sufficient to show that, given the absence of sensorimotor knowledge relative

[32] I come back to the exact character of these distortions on p. 63-65.

to one perceptual feature, the perceptual content relative to that feature disappears. If the sensorimotor knowledge relative to visual size is affected, then the perceptual experience representing size should be affected; and so for all the other properties represented by perceptual content.

I turn now separately to the inversion experiment (3.2) and to the "prism experiment" (2) in order to show that they fail to support enactivism, although for different reasons.

3.2. Inversion of Vision

In the left to right inversion experiment, the objects which are actually at my right appear at my left and vice versa. The spectacles do not distort or deformed the objects. In Kohler´s case, used by Noë, the inversion was even done by a mirror system, comparable to the inversion seen in our ordinary mirrors. Stimulation is perfectly normal as they always were and therefore our sensations are also normal. Just the location of the objects has changed. So, the condition of normal sensation is met.[33] As we noted before, there is also a partial disruption of sensorimotor knowledge. But in no reports on inversion experiments I know of, can we find a hint at a state similar to blindness or confusion of visual experience after putting on the lenses, neither in Stratton (1896 and 1897), nor in Kohler (1951), nor in more recent repetitions of the experiment (Linden et al. 1999, Miyauchi et al. 2004). Contrary to Noë´s claim, there is no hint at anything like "experiential blindness" just after putting on the spectacles, nor later. Stratton who used upside down inverting lenses notes that "all images at first appeared to be inverted; the room and all in it seemed upside down" and he adds that "these images were clear and definite", although he did not have a sense of reality associated with these images (Stratton 1896). Stratton clearly states that this sense of unreality does not derive from his visual impressions, but from his memory and the habit to consider the real world upright. Given that in the left to right inversion the appearances are not awkward in the same sense, there should not even be such a sense of unreality in that case. The first visual impressions of Stratton are a clear vision of objects and their properties. The problem is not vision, but the lack of coordination of vision with action and the following difficulties in normal behavioral tasks. In Kohler´s right to left inversion experiments, a similar picture is given: behavior is difficult and mal-adapted to vision, but there are no signs that vision is confused, blurred,

[33] Noë writes on inversion: „The light reaching his eyes is sharply focused and fully information-bearing. He receives exactly the stimulation he would receive were he looking at an object in different location without the inverting lenses" (Noë 2004: 8). Unfortunately, Noë does not see that this description does not apply to the „prism experiment", although he thinks so.

mixed up or that the disrupted behavior somehow affects perception (Kohler 1951: 15-19). The newer inversion experiments (Linden et al. 1999 and Miyauchi et al. 2004) mention equally the behavioral difficulties, but no failure to see.

The only exception to this picture is the effect of "apparent movement" induced by inversion. In normal vision, a turn of the head to the left is accompanied by a flow of the visual field in the opposite direction, i.e. to the right. With the inversion, the visual field flows in the same direction as the movement of the head. Usually, the information from the vestibular system about head movement is taken into account by the visual system to keep a constancy of object position despite optic flow. This cooperation of the vestibular and the visual system does not work anymore in the first days of the inversion experiment (Palmer 1999: 346). The coordination of the head movement and vision is physiologically explained by a reflex from the vestibular to the visual system. The reflex is complex in the sense that it can be changed and adapted to new conditions (see Berthoz 1997: chap. 2). Stratton already mentioned the effects of this lack of coordination of the vestibular and the visual system, as it appeared also in upside-down inversion. He gives the following phenomenal description:

> "The entire scene appeared upside down. When I moved my head or body so that my sight swept over the scene, the movement was not felt to be solely in the observer, as in normal vision, but was referred to both the observer and the objects beyond. The visual picture seemed to move through the field of view faster than the accompanying movement of my body, although in the same direction. It did not feel as if I were visually ranging over a set of motionless objects, but the whole field of things swept and swung before my eyes" (Stratton 1897: 343-344)

So, the visual perception of position constancy and movement are affected by the inversion experiment. Movement appears faster than usual and objects within their visual field seem to move when they do not. But neither the perception of size, shape, color or distance of the visual objects is affected by the inversion. There are no "roads arching like a wave", no "houses crashing down" and no "jellylike people" and no "topsy-turvy world" as in K´s report on the "prism experiment", but only apparent motion and a swinging of the visual field besides a normal and clear vision.

Is there "experiential blindness" in the right to left inversion? First, when the subjects with spectacles stand still, vision seems completely normal. This is true for the first moments of the experiment and also later, when the changed sensorimotor contingencies have been noted and the old sensorimotor knowledge has been abandoned. The disruption of sensorimotor knowledge does not change or disrupt vision. Even movement is perceived normally. The only abnormal aspect in vision is that all spatial content is nonveridical, it is a case of

perceptual illusion. Secondly, when the subjects move, only the perception of *motion* is changed. Objects or the visual field seem to move, when they do not, and the subjects themselves seem to move, when they do not. Perceptual content concerning movement is not disrupted, but subjects have experiences with illusory kinetic content. There is neither "blindness" nor a disruption of perceptual content in the inversion experiment, no "experiential blindness". Most properties of visual perception (color, shape, size, distance) are not affected by the disruption of sensorimotor knowledge, only motion perception is changed and may be affected by the loss of that knowledge.

Even if the loss of sensorimotor knowledge does not create a situation of "experiential blindness", does it change perception and its content in some way? Could there be partial "experiential blindness" limited to one feature of content? Sensorimotor contingencies relative to movement are changed and knowledge concerning movement is disrupted, but still there is kinetic content in vision. Although sensorimotor knowledge does not disrupt kinetic content, that content did change. Is the change due to disruption of sensorimotor knowledge? Perhaps. But there is a standard scientific explanation by the reflex coordinating the vestibular and the visual system (see Berthoz 1997). And it seems difficult to square the mechanisms of a reflex with the cognitive and conceptual operation of sensorimotor knowledge.

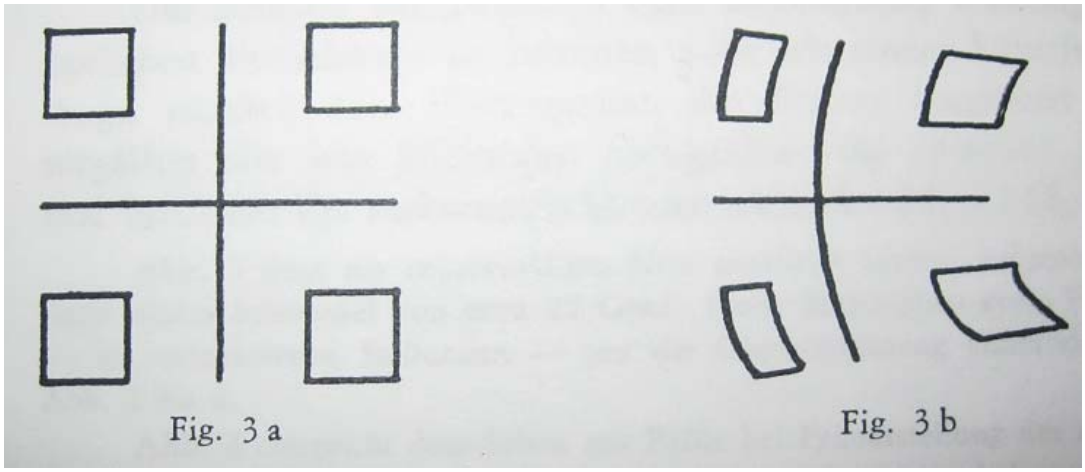
Furthermore, enactivism predicts that sensorimotor knowledge relative to a particular property (size, shape etc.) is a necessary condition for perceptual experience with that property as content: If sensorimotor knowledge concerning colors is disrupted, perceptual experience should lose chromatic content. As mentioned previously, the inverting spectacles change radically the sensorimotor contingencies relative to size perception and distance perception: size decreases and distance perception increases when we approach an object. The corresponding sensorimotor knowledge is disrupted. But still, the perception of size and distance of objects is not at all affected or changed in the inversion experiment, contrary to the predictions of enactivism. We see objects at a certain distance and we see that they have a specific size relative to our perspective. Size and distance perception is even veridical. But still we have massively deceived expectations about the way size and distance change with our movements.

I conclude that the inversion experiment is neither a case of "experiential blindness" nor does it show that perceptual content changes with the loss of sensorimotor knowledge.

3.3. Distortion of Vision

Let us new turn to the other experiment, the “prism experiment”. When we read the report of K (see p. 57-8) about the first moments with the displacing and distorting lenses of the “prism experiment”, a massive change of perceptual experience is clearly noticeable. Shapes are deformed, things are aggregated into one and re-separate, stable things show impossible movements, for example streets move like waves. Noë comments on K´s report: “Crucially, the kind of blindness K suffers is not caused by any defect in sensation. K receives normal stimulation.” and he concludes: “The inability to see normally stems not from the character of the stimulation, but rather from the perceiver´s understanding (or rather failure of understanding) of the stimulation.” (Noë 2004: 8). So, Noë claims that the strange and confused perceptual experience of K (a case of “blindness“) is not due to “abnormal“ stimulation and sensation, but is due to the failure of sensorimotor knowledge (or “understanding“). Obviously, sensorimotor contingencies are changed in the “prism experiment“, and the corresponding knowledge is useless. The predictions based on that knowledge are mainly deceptive. But if we look at the details of the experiment, the claim that stimulation is „normal“ is untenable. Noë seems to extrapolate here from the inversion case, where stimulation was almost identical with the normal and common stimulation of the eyes.

In the “prism experiment”, on which K´s report is based, the retinal image is not inverted, but only displaced by 7^o and later by 10^o. But through the specific optical refraction of light in the spherical prism, the retinal image is completely distorted. Figures from Kohler´s book (Kohler 1951: 36) show how a shape under conditions of normal vision (Fig. 3a) appears visually through the distortions by the spherical prisms (Fig. 3b).



Kohler gives a detailed description of the distortion of the stimulus in that experiment: Forms

and lines are bent (as seen in the figure), the visual field is distorted in such a way that objects on one side of the field are contracted and on the other side are extended, movements are different on one side of the visual field from the same movement on the other of the visual field, apparent movements are seen, on the edge of objects unusual colors are seen (an effect of the refraction of light in the prism) (Kohler 1951: 82-3)[34]. The stimulation in the visual experience reported by K is strongly distorted and changed if we compare it to normal visual stimulation. Almost all properties represented in visual experience are directly affected by the distortion of stimulation: shape, size, distance, orientation, color and movement.

Although there are no deficits in sensory processing and in the sensory receptors, the case of the "prism experiment" is confronted with similar problems as the cataract case. The chaotic experience is not explained by unusual sensory processing, but it can be explained by the unusual refractions of light just before it encounters the sensory receptors. The visual experience can be compared to the one we have, when we look in distorting mirrors. We seem "jellylike" in them and the objects make strange waves. Certainly, our usual expectations about the way appearances change with our movements are deceived when we look in these mirrors. But not our lack of understanding and our failed expectations explain the funny shapes and distortions. They are explained by the distortion of light on the mirror, and so it is with the distorting lenses.

Certainly the sensorimotor knowledge and skills are disrupted in the "prism experiment". And it could be that this disruption has some effects on perceptual content. But there is the condition that we can only show a dependency of perceptual content from sensorimotor knowledge, when sensation does not change completely at the same time, i.e. the condition of "normal" sensation. The "prism experiment" does not fulfill that condition. It is impossible to exclude in this case that the confused visual experiment is just due to the properties of the stimulation. Even more, it is quite probable that the unusual stimulation explains the confused visual experience and the failure of sensorimotor understanding does not. The "prism" experiment" cannot be used to support the thesis that there is "experiential blindness" due to a failure of sensorimotor knowledge. It is not an evidence for enactivism.

[34] This description is given for the experiment with prisms covering only the upper half of the visual field, but the effect of these prisms are the same as in the experiment with prisms covering the entire visual field, i.e. the experiment mentioned in Noë.

4. Perceptual Content beyond Enactivism

Enactivism claims that our perceptual experience acquires content only if we have sensorimotor knowledge. Any perceptual experience without that kind of knowledge would be a case of "experiential blindness", of visual experience which is not about anything. We saw that there is no evidence for "experiential blindness" and no evidence for a disruption of content when sensorimotor knowledge is actually disrupted. All to the contrary, the lens experiments show that perceptual experience continues to be about external objects and their properties, although our practical knowledge and skills have been massively disturbed or destroyed. Perceptual content persists without sensorimotor knowledge. This has several consequences.

First, the content of perceptual states has to be explained by something else than sensorimotor knowledge. Another theory of perceptual content is needed. Secondly, although sensorimotor knowledge is not constitutive for perceptual content, it could still be the case that it influences the content of our perceptual content. Although content persists without that knowledge, a change of sensorimotor knowledge could change the perceptual content of our experience. Sensorimotor knowledge could still play a role, although a limited one, in the explanation of perceptual content. Thirdly, if sensorimotor knowledge has a reduced role for perceptual content or is completely independent of it, than it has to be cleared what its function actually is. A plausible explanation is that its main role is to use perceptual information for the guidance of action, for the adaptation of behavior to the conditions of the environment. On this hypothesis, sensorimotor knowledge shapes action, but is neither constitutive nor necessary for perceptual content.

Conclusion

It is essential for enactivism to show that sensorimotor knowledge and skills are necessary conditions for perceptual content. The dependency of content on that kind of knowledge can only be established if there are empirical cases where experience fails to have content because there is no corresponding sensorimotor knowledge, i.e. cases of "experiential blindness". Noë gives two examples of "experiential blindness": cataract operations and lens experiments. Previous criticism showed that the experience of patients operated from cataracts is not a case of "experiential blindness" but of congenital sensory deficits. A similar failure to establish "experiential blindness" can be shown in the lens experiments. In these experiments, either

there is no experience with disruption of perceptual content, or there is a disrupted perceptual experience but only because of a distortion of stimulation. The lens experiments give no evidence that perceptual experience fails to have content whenever there is a failure of sensorimotor knowledge. The two main examples of evidence for enactivism do not support the burden of proof. More probable than the enactivist linkage of content with sensorimotor knowledge is their independence. Our knowledge about the way the perceptual properties of objects change with our movements is essential to guide our behavior and to adapt it to the conditions in the environment. It is essential to coordinate action with perception, but it does not shape and transform perception itself.

Chapter 3

Relationalism and Illusions

Introduction

Recently, the view that perceptual experience is a form of representation and that it has content was criticized and rejected by a certain number of philosophers of perception. In opposition to the representational view (or the content view), they defend the view that perceptual experience is essentially a relation to external and mind-independent objects or properties. For this relational view, objects and properties enter into the perceptual experience as constitutive parts, but the experience does not *represent* these objects or properties and therefore has no representational, or intentional, content. In relationalism, the perceptual relation to objects and properties implies the existence of these objects or properties. The idea of an intentional content that represents some object (or property) which may not exist, to which therefore we cannot be actually related, is rejected in that relational view. But it was a central motive for the representational view to introduce intentional content as an explanation of perceptual illusions i.e. cases where it seems to us as if we see some property which is not instantiated in the object we are seeing. In the representational view, this property is just represented and is part of the intentional content, although it is not instantiated in the object we actually see. The relational view cannot give such an account of perceptual illusions. As relationalism rejects that perceptual experience is a form of representation, it cannot analyze perceptual illusions as cases where experience falsely represents certain properties of objects. Perceptual illusion cannot be analyzed as a case where perceptual experience itself is erroneous or misrepresents. In order to be a serious challenge for the representational view, it is essential for relationalism to give an alternative account of illusions. I will examine in this chapter the two main strategies of relationalism to give such an alternative account.

The first strategy is to deny that in typical cases of perceptual illusion, the error has to be attributed to perceptual experience itself. As we cannot subjectively distinguish between a case of veridical perception and a case of illusion (for ex. two unequal lines and the Müller-Lyer figure with its equal lines), this may be due to the fact that we are not related to the property which makes the difference between these two cases. I will argue that this explanation fails, because illusions involve a phenomenal difference in the perception of objects of the same type (or, symmetrically, phenomenal sameness in the perception of objects of different types). Relationalism requires that the phenomenal character of an

experience is explained by the perceived object, and therefore that any phenomenal difference between two experiences is explained by a difference in these objects. But in many illusions, that phenomenal difference cannot be explained by a difference in the perceived object.

The second strategy is to attribute the seeming error of perception to other mental states than perceptual states. We think wrongly that our perceptual experience is a relation to a specific object or property when it is not. The error is attributed to judgment or thought. Although these higher mental states could explain error, they cannot explain why things phenomenally appear to us in a certain way in illusions. This strategy is confronted with the difficulty to explain how thoughts or judgments can explain the phenomenal character of illusory experience. Both relational strategies to explain illusions are confronted with serious problems. I will claim that, given these problems, the representational view still offers a better explanation of perceptual illusions and perceptual experience more generally.

I will first present the different explanations of perceptual experience given by the representational view and the relational view (1). The two following sections will criticize the relational analysis of illusions: the view that perceptual experience itself does not have to be analyzed as a form of perceptual error (2), and then the explanation of error in illusions by errors in thought or higher order propositional attitudes (3). As conclusion, I will claim that the representational view of illusions can still give a better account of illusions. A precise justification for that last claim will only be given in the last chapter (chapter 5), where I will also show that intentionalism can incorporate certain advantages of the relational view, while avoiding its shortcomings.

1. The Content View versus the Relational View

1.1 The Conflict

When we perceive something, we stand in a certain relation to objects (or events) in our environment and their properties. Perception (as seeing, hearing etc.) consists in a relation to the objects we are perceiving. I would not see an apple, if no apple were in my environment and if I were not standing in an appropriate relation to that apple. So, perception is a factive relation, it implies the existence of a perceiver and of the object seen. This may be different for perceptual experience, the phenomenal experience we usually have when we perceive something. We can imagine cases where we have a visual experience of some object while we do not actually stand in a relation to such an object in our environment. We may dream, hallucinate or have the visual illusion of an apple. In these cases we have the visual

experience of an apple, while we do not perceive an apple. The impression we have that our perceptual experience can mislead us and can be non-veridical, that it can present something which is not there, was a strong argument for the view that perceptual experience is a form of representation. It is definitional for representations that they have a content and that the content can be accurate or inaccurate, veridical or non-veridical. In the philosophy of perception, it became quite common to treat perceptual experience on the model of propositional attitudes, where a mental state is a relation to some propositional or pictorial content (Searle 1983, Peacocke 1983, Harman 1990, Tye 1995, Dretske 1995, Lycan 1996). Although this view of perceptual experience has been called by some representationalism, I will call it, following Brewer (2006), the content view or also intentionalism, in order to avoid confusion with representationalism as a theory about consciousness and the nature of the phenomenal character of experience. It is important to distinguish the content view from representationalism as the view that the phenomenal character of the perceptual experience supervenes on the representational content of the experience. The content view is neutral on this later question of the explanation of the phenomenal character.[35]

We can summarize the content view by the following two theses:

(1) Perceptual experience has content (or is a relation to a content).
(2) Perceptual experience can represent P when there is no P (Intentionality).

The content view does not specify what type of content experience has; it can be propositional content, pictorial content or scenario content. Important is only the fact that the content specifies accuracy conditions, i.e. conditions under which the perceptual experience is accurate or veridical. These accuracy conditions may be given by propositions or some non-propositional scenario.[36] The propositional content can be specified as a structured proposition or an unstructured set of possible worlds. A structured proposition is composed of components: objects, properties or concepts. These components are connected by a propositional relation. The relation of predication is for example a possible propositional relation connecting concepts, or connecting objects with properties.[37] Generally two versions of structured propositions are defended, Fregean propositions (or content) composed of

[35] See Peacocke (1983) and Block (1990) for a content view which rejects representationalism, but accepts intentionalism. Crane (2009b) emphasizes this distinction between the content view (or what he calls intentionalism) and representationalism.
[36] For scenario content, see Peacocke (1992). Peacocke conceives that content as non propositional.
[37] On the question of the propositional relation and the unity of the proposition connecting its components, see King (2009), Soames (2010).

concepts and Russellian propositions (or content) composed of objects and properties. Both versions of propositional content are defended in the case of perceptual experience (for Fregean content, see McDowell (1996), Chalmers (2006), Schellenberg (2011a) for Russellian content see Tye (2009)). Contrary to the definition of content as structured propositions, unstructured propositions can avoid to specify the components of the proposition and their relation. It defines a proposition as a set of possible worlds. The sentence "A table is red", expresses a proposition defined by the set of all possible worlds containing a red table. If I perceptually represent singular objects, for example this red table, then the content is the set of possible worlds in which *this* table is red. If perceptual experience is conceived as representing objects from a specific point of view, then the content is a centered possible world, a world indexed on a perceiving subject and a specific time.[38]

Having content or being related to a content does obviously not exclude being related to external objects or properties as it is the case in veridical perceptual experience. And it does not exclude that objects and properties enter the content as it is the case in Russellian propositions. In that case, being related to the content involves being related to the objects and properties which are the components of the proposition. But there are also other versions of the content view, where the relation to the content does not involve any relation to an object or property, but just involves that the world is represented in a certain way.[39] On the view of Fregean content for example, the proposition is composed only of concepts or modes of presentation which refer to the world, but no objects or properties enter into the content itself.

When I use the term representation, I will always mean the higher form of representation which implies the thesis of intentionality that the represented object may not exist. Representation in that form is different from the simpler form which requires only that the vehicle of representation stands in a causal or informational relation to the represented object and where the vehicle cannot represent without standing in that causal or informational relation to its object. Such a relation is factive in that it implies the existence of the relata, while the intentional relation to an object is not factive. The higher form of representations mentioned here have intentional content. Representation in that sense implies the possibility of misrepresentation and error.

Recently, the content view has been criticized and it has been questioned that

[38] In chapter 5, I will discuss which type of content is the most appropriate to characterize perceptual content. I will opt for structured, Russellian content.

[39] See Logue (2009) for the distinction between relation-including and relation-excluding versions of the content view.

perceptual experiences have representational content.[40] Against the content view, it has been emphasized that perceptual experience is essentially a relation to external and mind-independent objects and properties (Campbell 2002, Martin 2004, Travis 2004, Johnston 2004, Brewer 2006, Noë 2006, 2009 and 2012). For this relationalist view, the factive perceptual relation is paradigmatic for perceptual experience: As we cannot see an apple if there is no apple, we cannot have a perceptual experience of an apple without there being an apple in the proximate environment. Generally, relationalism defines the relation involved in perceptual experience as the relation of *acquaintance* between a subject and external, mind-independent objects or also their properties. Noë (2006) speaks simply of "a contact" with objects and situations of the world. The external objects and their properties are constitutive parts of the experience and experiences differ with the objects or properties which enter into them. In opposition to the content view, the main position of relationalism can be described by the following theses:

(1) Perceptual experience is a relation of acquaintance to objects, events, situations or properties.
(2) Perceptual experience has no representational content.
(3) Perceptual experience can obtain or fail to obtain, but cannot be veridical or non-veridical.

A fundamental difference to the content view is the rejection of intentionality in perception. There is no perceptual experience of P, if the experience is not actually related to an actual P. But it is possible that, in the absence of P, it seems to me that I have a perceptual experience of P. In this case, I am just wrong about my perceptual experience. Relationalists do not deny that other mental states may have representational content; they just deny it for perceptual experience. They do not reject the representational theory of the mind, but just reject its application to perception. In that sense they are less radical than those philosophers who reject the concept of representation generally (as some defenders of a purely syntactic theory of the mind or of dynamic systems theory).

Although some intentionalists defended the content view against the relationalist challenge (Byrne 2009, Schellenberg 2011a, Pautz 2009 and 2010), Siegel (2010) questioned

[40] Some relationalists like Brewer (2006) or Travis (2004) reject totally the use of the term content in the case of perceptual experience. Others like Noë (2006 and 2012: chap. 3) reject only the attribution of *representational* or *intentional* content to perceptual experience, but continue to speak of content. But Noë means by perceptual "content" only the objects and properties we actually stand in contact with. The difference is only terminological between those who reject to speak of perceptual content and those who reject any *representational* content in perception, but continue to call the objects or properties we are related to a "content".

whether there really is such a strong opposition between the two views. Siegel distinguishes a weak from a strong version of the content view and claims that the weak version, which she calls the *"Property View"*, is compatible with most versions of relationalism. She claims that only the *"Strong Content View"* is in opposition to most versions of relationalism. The "Strong Content View" says that perceptual experience is a propositional attitude toward perceptual content. The weaker "Property View" says only that perceptual experiences involve "relations to properties presented in experience" (Siegel 2010: 71); a position most relationalists would accept. Siegel claims that such a relation to properties is already sufficient for the ascription of accuracy conditions to perceptual experiences. These experiences are accurate, if the properties they are related to are instantiated. So, if one admits that experiences are related to properties and that properties are instantiated, a weak version of the content view cannot be avoided. Only a radical version of relationalism ("Radical Naïve Realism"), which says that experiences are relations to objects, but not to properties, avoids the content view, so Siegel´s analysis. But it is questionable that a relation to properties is sufficient to establish a weak version of the content view. First, as Siegel admits, experiences can be relations to properties which do not specify any conditions in the environment and which therefore do not fix accuracy conditions. If perceptual experience is just a relation to properties of the subjective experience, for example to raw feels, or a relation to properties of sense data, then that experience specifies nothing about the environment. There are no specific conditions in the environment which would make that experience inaccurate. The experience would have no accuracy conditions. So, experience must not just be a relation to properties per se, but must present these properties to be instantiated in some object. But then, it is unclear how such an experience, which presents property P to be instantiated in X, differs from a relation to a proposition representing P to be instantiated in X and therefore, how it differs from the Strong Content View, the view that perceptual experience is a relation to propositional content.

But even if there is no sharp difference between Siegel´s weak and strong version of the content view, the Strong Content View itself, i.e. perceptual experiences conceived as propositional attitudes towards content, can be quite close to relationalism, as Siegel underlines (Siegel 2010: 74-75).

First, intentionalists can accept *disjunctivist explanations* of perceptual experience and therefore give different explanations for hallucinatory and veridical experiences which seem subjectively indistinguishable (see McDowell 1996 and Tye 2007 for such a disjunctivist intentionalism). Disjunctivism was originally introduced to reject a presupposition of the

argument from illusion, namely that experiences which are subjectively indistinguishable must be explained in the same way (Hinton 1973, Snowdon 1990). In the argument from illusion (Ayer 1940), it was supposed that we can have veridical and illusory experiences which are subjectively indistinguishable. From there it was inferred that the phenomenal character of the two experiences must be explained in the same way. Disjunctivism rejects this. A disjunctive explanation of the subjectively indistinguishable perceptual experiences is possible: the veridical experience can be explained by a relation to the seen object and the same phenomenal character in the illusory case by something else, for example some representational content. A disjunctive explanation of indistinguishable experiences is possible. (for a review of disjunctivism, see Byrne and Logue 2008).

Secondly, in the non-hallucinatory cases, *propositions* can involve or be *constituted by objects and properties of the external world*. Under these conditions, a relation to these propositions involves a relation to external objects and their properties. It is possible to formulate a version of the strong content view, where perceptual experience is conceived as a relation to a Russellian proposition constituted of objects of the environment and their properties (see Thau 2002 and 2007[41]). Russellian propositions can also have some empty slots or gaps into which objects can enter. Tye (2009) proposed such a version of gappy contents.[42] Such versions of the content view are quite close to relationalism. But can we conclude from this that it is merely a matter of terminology whether experiences are relations to object- and property-involving propositional content or whether experiences are only relations to objects and properties, a non-propositional content, which may give rise to propositions, as Siegel suggests (Siegel 2010: 75)? On a view of propositions as discussed above, what differentiates intentionalism from relationalism is the way the objects and properties are related. If perceptual experience is a relation to a Russellian proposition, then its components, objects and properties, are united by a propositional relation, for example the relation of ascription or predication.[43] The propositional relation ascribes the property to the object and this ascription (or predication) can be true or false. The object can actually instantiate that property or not. Although both relationalism and this kind of intentionalism would claim here that the experience is a relation to external objects and their properties, intentionalism has, with the propositional relation, a means to evaluate the accuracy of the

[41] In Thau (2007) actually abandons the reference to propositions and suggest that a relational explanation of experience is preferable in order to avoid any reference to abstract entities which might be involved in propositions. In chapter 5, I will defend a view similar to Thau´s Russellian content in Thau (2002).

[42] See Tye (2009) for gappy content in Russellian propositions and Schellenberg (2011a) for a Fregean version.

[43] For the question of the unity of propositions and the propositional relation, see Soames (2008) and King (2009).

experience itself, a means relationalism has not.[44] Both the relationalist and the intentionalist can say that perceptual experience is a relation to objects and properties, but for the intentionalist perceptual experience, by its relation to a proposition, also indicates which property is ascribed to which object.[45]

Although there are versions of the content view which are in strong contrast to relationalism, versions in which the content is constituted of concepts or abstract objects which refer to the objects and properties of our environment, there are other versions where the difference to relationalism seems slight. But still, there remains the difference that experience is accurate or inaccurate, veridical or non-veridical in one case, but not in the other.

1.2. Reasons for Relationalism

I have described the conflict and opposition between the content view and relationalism, but I did not mention what makes relationalism attractive. I will now consider and evaluate four arguments which relationalists give in favor of their view: (1) The phenomenological argument, (2) the argument from particularity, (3) the argument from indeterminacy and (4) the argument from science.[46]

(1) *The phenomenological argument*: The main argument for a relationalist view of experience comes from considerations about the phenomenology of our perceptual experience. In visual perception we seem to be immediately presented with the external physical objects and their properties. I see my table, its blue color and the papers and computer on it. It does not seem to me that representations are involved in the experience of these objects. They are immediately present. Compare this to reading, where you see letters and lines covering a page and through them you get information about something else. Nothing resembles this mediated representation in our visual experience. We neither feel the presence of some vehicles of representation (as the letter in reading) nor any relation to a content other than the singular physical things themselves. Relationalists speak of the "sense of presence" (Noë 2006: 48) or of the sense of intimacy in perceptual experience and explain

[44] If we adopt an unstructured view of propositions as sets of possible worlds, for example sets of possible worlds involving this particular object and its properties, the difference to relationalism may be stronger then on the structured view of propositions, given that sets of possible worlds are abstract objects. But the mentioned strong content views closest to relationalism, i.e. McDowell (1996) Thau (2002) and Tye (2009), all use the structured view.

[45] I will give in chapter 5 a more extensive defense of an intentionalist view which conserves the advantages of relationalism.

[46] For an overview of the main arguments for relationalism, see Logue (2009), Siegel (2010) and Schellenberg (2011a).

this feeling by the specific relation of *acquaintance* a subject has towards the objects. We do not have this feeling of presence in other mental states like for example in beliefs or other propositional attitudes. The things we think about are not immediately and unavoidably present in the way they are in visual perception.

This is certainly a strong argument against any version of indirect realism, a position which holds that we are aware of the external things by being aware of some other intermediaries. Classically, sense-datum theory was such a form of indirect realism and sense-data were conceived as such intermediary objects of awareness. But intentionalism rejects this form of indirect realism. Most intentionalists accept the transparency of experience.[47] Experience seems transparent to us in the sense that we are only aware of external objects and their properties, but not of any properties of the experience itself. When we try to concentrate on any quality or property our experience has, we cannot avoid concentrating only on the qualities and properties objects seem to have. In that sense experience is transparent or diaphanous (Moore 1903).

Furthermore, for the content view in perception, we are only aware of the objects of the environment and not of a proposition or accuracy conditions, even if perceptual experience stands in some relation to propositions. So, the phenomenological argument is strong against indirect realism and against intentionalists who reject the transparency of experience and accept "sensational content" and qualia, the awareness of intrinsic phenomenal properties of experience. But that argument is no real threat against intentionalists who accept that the phenomenal character of experience is wholly explained by representational content (representationalism). Still, intentionalists are confronted with the question, why perceptual experience gives rise to the feeling of the presence of objects while beliefs do not, although both are conceived as relations to propositional content. But this difference can be explained by the different nature of the content in beliefs and perceptions, for example by the view that perceptual content is non-conceptual, contrary to belief. If we further suppose that a belief stands in a relation to a proposition formed of concepts, while perceptual experience stands in a relation to a proposition composed of external objects and their properties, then the force of the phenomenological argument as an argument for relationalism disappears mostly.

(2) *The argument from particularity*: When I see an object, for example the tree in front of my house, I do not only see some object which instantiates a certain number of properties, but I see *this* particular tree. I would not see *this* tree, if I had an identical

[47] For intentionalists rejecting the transparency of experience, see Peacocke (1983), Block (1990), Crane (2009b).

perceptual experience somewhere else. Furthermore, my capacity to have singular thoughts, thoughts about this particular object, is explained by the fact that I have or had a perceptual experience of this singular object. Now, relationalists claim that they can explain in a better way our capacity for singular thought, because these thoughts derive from our perceptual relation to particular objects (Martin 2002, Campbell 2002). For relationalism, the particular object is a constitutive part of the experience and these experiences are individuated by the particular objects they are related to. For intentionalists, experiences are individuated by their content and this content may be independent of the particular object one is seeing.

It is certainly true that some versions of the content view cannot account for any singular content of perceptual experience. Tye called the Existential Thesis the principle that the content of perceptual experience is specified without reference to a particular object. It is specified by propositions containing no objects, but only existentially quantified variables and properties (Tye 2009). But if this thesis is rejected, as it is in Tye (2009), singular objects can enter into the content of experience. The content is then given by a proposition which has singular objects as constituents. Under these conditions, the advantage relationalism derives from the argument from particularity can also be captured by the content view (see Schellenberg 2011b for such a view). So, intentionalism can accommodate singular content. But contrary to relationalism, it is not commited to singular objects. Singular objects can enter into its content, but also other entities as for example intentional objects. This is indubitably an advantage when it comes to perceptual experiences, where there seems to be no object, as in the case of hallucinations.

(3) *The argument from indeterminacy*: Travis (2004) has argued that perceptual experience does not determine a specific content. Perceptual experience does not determine a specific way the world must be for the experience to be veridical. Given that experience has no determinate content, Travis rejects generally the idea of perceptual content. First, his argument is based on the presupposition that content is supposed to be given by the perceptual appearances. We attribute content to experience by attending to the appearances, the way things "look", "appear" or "seem". If something looks to be X, then we attribute content X to that perceptual experience. Secondly, Travis supposes that we get a correct analysis of what appearances are by looking at the comparative sense of appearance words ("look", "seem", "appear")[48]: Looks are understood in the sense that something "looks like" X, "appears like" X. If I experience the appearance of a cat, then something *looks like* a cat to me. The central argument then is that there is no one way that something looks like, but that what something

[48] On the different senses or uses of appear words, see Chisholm (1957: chap. 4) and also Schellenberg (2011a) in her criticism of Travis.

looks like depends on the comparisons which are made in different contexts. An animal can look like a cat in one context and like a dog on others, for example from far away. There is no limit to such comparisons and the same experienced objects can sometimes seem as one type of thing and sometimes as another, sometimes look like a cat, sometimes like a dog. Given that the perceptual appearances in that comparative sense are highly indeterminate, the argument concludes that perceptual experiences have no content at all.

For Travis, only *thoughts* about the perceptual experience give to it a determinate content. I see this specifically as a "black cat", only when I apply these concepts to the perceptual experience, only when I *think* that it is a black cat. Before that, given only the perceptual experience, I could see it as something different. For Travis it is therefore a mistake to attribute a specific content to perceptual experience itself, because that content comes in only at a higher conceptual level, the level of thought and judgment. It has been criticized that this argument relies on a specific interpretation of appearance words, namely the comparative use of these words, which is only one possibility to interpret this kind of terms (Schellenberg 2011a).

(4) *The argument from science*: In the last 30 years cognitive psychology has strongly emphasized the view that perceptual experience are the result of a complex constructive process where internal representations of the distal objects of the environment are constructed from the information available at the proximal stimuli of the senses. The function of perception is the construction of internal representations (for an overview, see Palmer 1999. chap 1). This empirical work was a strong support for the philosophical view that perception is a representation of distant external objects. But more recent developments in psychology have criticized the view that perception consists in the construction of internal representations. In the last years psychologists have emphasized the role of direct interaction with the environment and the use of the information immediately available in the environment without the necessity to construct complex internal representations. Experiments on change blindness and inattentional blindness could show, that the internal pictures of our environment the visual system was supposed to construct is much less complex and poorer in detail (Simons and Levin 1997 and 1998; Simons and Chabris 1999). Others have claimed that representation is not like an internal image, but is much more distributed. Information is distributed in order to guide different processes of interaction with the environment. There is no need to bundle this information into one internal model or image of the environment (Brooks 1991). Some psychologists have claimed that there is no need for the construction of internal representations in perception, because we can use just the bit of information present in the

environment in the moment we need it. Instead of complex internal representations, we can use the world as an "external memory" (O´Regan 1992). These recent developments have led to a certain skepticism about internal representations.

Logue (2009: 62-63) stressed that the central role of representations in cognitive psychology is a problem for relationalists, given that this scientific concept of representation fits perfectly well the philosophical view that representations involve propositional content.[49] Logue concludes that there is an "argument from science" against relationalism. But given the growing skepticism about representations in certain areas of cognitive psychology, there is equally an argument from science for relationalism and for a view which emphasizes the direct access to and the direct interaction with the environment. Especially Noë (2004) emphasized that these developments in certain areas of the cognitive sciences make a relational view of perceptual experience more plausible. Noë emphasizes the active and touch like character of perception and the dynamical contact with the environment and questions the role of internal representation in perception.

But cognitive psychology still dominantly uses the concept of representation, especially in the psychology of perception. And that concept is often used, in a way similar to its meaning in philosophy, as having content and expressing a proposition.[50] Even if representations are conceived as less complex and rich, as distributed and extended in a dynamic way, they are still an obstacle to a view, such as relationalism, which rejects generally representations in perception. Sometimes relationalists avoid this problem by confining the representations of cognitive science to the sub-personal level or by denying that the representations postulated by the cognitive sciences have semantic properties and representational content (see Travis 2004: 59, Noë 2004: 28 f.). They argue that the concept of representation used in psychology refers only to causal processes at the sub-personal level, processes which have neither accuracy conditions nor content. This interpretation is questionable, given that psychologists explicitly say that perceptual experience can be wrong and can misrepresent the environment. Perceptual representations can be the product of the *misapplication* of hidden assumptions in the cognitive process. Perceptual illusions are explained by such misapplications of cognitive assumptions which normally generate accurate representations. These misapplications are explicitly taking place at the sub-personal, unconscious level (Palmer 1999: 8).[51] The strategy of relationalists to confine the normative

[49] See p. 30-32 for a similar argument.
[50] See chapter 1, section 4.
[51] See p. 31 for evidence that psychologists use representations in a way which attributes semantic properties to them.

and semantic evaluation of mental states only to the personal level is explicitly in contradiction to the position taken by many cognitive psychologsts. It is therefore questionable that such a division of labor of philosophy at the personal level and cognitive science at the sub-personal, semantic content at the personal level and purely causal processes at the sub-personal level can be maintained.

The four arguments support relationalism, but are not decisive against the content view. But it is certainly so that intentionalists must move much closer to a relationalist view in order to disarm arguments like those given in (1) and (2). But the particular force of the content view lies in its capacity to explain the non-veridical cases of perceptual experience, the cases of illusion and hallucination. It is therefore particularly important for relationalism to address these cases and give an alternative account to the one which explains illusions (and hallucinations) by representational content.

1.3. The Problem of Illusions

I will first describe the problems for a relationalist account of illusions. I will then show how these problems are used in the argument from illusion against any direct realism. Ultimately, the argument from illusion fails against the relationalist version of direct realism, but the problems to account for illusions stay a challenge for relationalism.

The relationalist claims that perceptual experience is a relation to objects and properties. These objects and properties enter into the experience and are components of it. When I see a black cat, I am related to that cat and this animal enters into my perceptual experience. As we saw with the phenomenological argument, relationalism wants also to give a plausible account of the phenomenology of our experience. When I see a black cat, a black cat appears to be in front of me and the fact that I stand in a perceptual relation to this cat and its property (blackness) explains the specific appearances. So, for relationalists the perceptual experience has a "world-revelatory character" (Logue 2009: 36). But this description of experience only works for "veridical" experiences, but not for perceptual illusions. In illusions we have the following situation:

(1) An object appears to have property P.
(2) The object does not instantiate property P (but property Q).

What we seem to see is contradicted by the actual properties of the seen object. Two problems

arise for relationalism. The first problem is, how to give an *account of the phenomenology of illusion*, that is, how to account for condition (1). Some relationalists (Brewer 2006) explain the phenomenal character of perceptual experience by citing the object we see. But if no feature of the object can explain the specific phenomenal character of the experience, there is a problem. How can the relationalist give an account of statement (1)? Let us say, there is actually a black cat and it seems to me that there is a blown cat. The perceptual experience can only be a relation to the object or to property Q it instantiates (the cat and its blackness). As what I see does not instantiate property P, the perceptual relation does not explain what appears to be in front of me (property P, i.e. brownness). My relation to the actual black cat cannot explain the appearance of a brown cat. So relationalism has a problem to explain statement (1), i.e. the phenomenology in illusions. Often it is even so in illusions that the fact that the object instantiates property Q, excludes that the object instantiates property P. The cat cannot be black and brown at the same part of its surface. So, the perceptual relation to that black part of the cat seems even to contradict the brownish appearance of that part in my phenomenology.

There is a second problem for relationalism: given condition (2), how can we *avoid saying that perceptual experience is erroneous*. Error implies the attribution of false content. As relationalists deny that perceptual experience has representational content, they have to avoid the attribution of error to perceptual experience. The relationalist must avoid saying that perceptual experience presents something which is not the case or that experience is in some way erroneous. So he must either avoid to say that there is a mismatch between the appearance of P and the fact that the object is Q, or he must attribute that mismatch to some other mental state than perceptual experience, usually a mental state which, contrary to experience, has representational content.

The two problems are connected in the following way: If in the case of illusions, the relationalist cannot explain the phenomenal character of perceptual experience by citing external objects and their properties, he will be forced to explain that phenomenal character by something else than these objects. The usual response is that in the case of illusion, the phenomenal character of experience has to be explained by the representational content. The attribution of error to experience has the same consequences; it forces to accept that experience has false representational content. In both mentioned problems of illusion, the relationalist is challenged to offer explanations of illusion which avoid the attribution of representational content to experience.

Let us now turn to the challenge presented for relationalism by the *argument from*

illusion (Ayer 1940 and 1956; for analyses of the argument, see Robinson 1994, Smith 2002). Relationalism is a form of direct realism and the argument from illusion was especially developed against direct realism. The argument is supposed to show that we never directly perceive the external objects of our environment. If that were true, relationalism would be untenable. The argument begins from the case of illusion as described by statement (1) and (2) above and from the fact that a relational account of experience in this case of illusion is implausible. The experience of P stated in (1) cannot be an experience of the external object, because that object does not instantiate P. The argument concludes from the fact that there is no external object which is P, that the experience must be of a mental object which instantiates P, a sense-datum. This conclusion presupposes the so-called phenomenal principle (Robinson 1994: 32). The principle says that if I have an experience of some property, then there must be some object which instantiates that property. That principle is contestable and is rejected by intentionalists. I can have an experience of P, when there is nothing which instantiates P. The experience of P is just explained by some intentional content and not by an object which is P. So the inference to mental objects like sense-data can easily be blocked with the rejection of the phenomenal principle. But still, the argument relies also on the difficulty to give a direct realist (or relationalist) account of the phenomenology of illusion, the first problem of illusion mentioned above. And this rests a problem for relationalism.

The second part of the argument from illusion generalizes the inference to sense-data as objects of experience to all cases of perceptual experience, veridical or non-veridical experience. It starts from the subjective indistinguishability of the illusory experience from the veridical experience, i.e. from the case where instead of condition (2) above, we have (2´): the object does instantiate P. It is supposed that in both cases, (2) and (2´), it is possible to have experiences which cannot be distinguished by using introspection and reflection alone. So it is supposed that we cannot distinguish the case where the object does instantiate Q although it seems to instantiate P from the case where it actually instantiates P. A transition between the experience in the veridical and the illusory case could be seamless and unnoticeable. The argument introduces a further requirement, the “sameness clause“. This clause requires that we should explain the same phenomenologies of experience in the same way. This second part of the argument supposes that the phenomenology can be the same in the veridical and the illusory case and the first part of the argument concluded that in the case of illusions, the phenomenology is explained by a mental object or sense datum. Given the sameness clause, it is infered that the phenomenology of the experience in the veridical case has also to be explained by a mental object or sense datum. The thesis of direct realism that in

a perceptual experience we are directly aware of the external objects without being aware of intermediaries is therefore rejected. Now, the relationalists generally reject the sameness clause: it is not the case that, if we cannot subjectively distinguish between two experiences, we must have experiences of the same kind. Our capacities for introspection are limited and we could have different experiences without being able to distinguish them subjectively (Martin 2004). And if the perceptual experiences are different, then the explanations for these experiences can also be very different. So, even if a satisfactory relationalist explanation of the perceptual experience in the case of illusion is not available, the relationalist explanation of experience in the veridical case can be perfectly correct and satisfactory. Although we seem to experience P in both cases, we actually have two different experiences and are related to two different objects, to an object instantiating P and an object instantiating Q.

The argument from illusion does not succeed to reject direct realism and relationalism concerning experiences in veridical cases. But still it is so, that the cases of illusion are quite problematic for relationalism. And it is essential for relationalism to give an account of illusions in order to be able to compete with intentionalism. I will discuss in the two next sections how relationalists address the two mentioned problems of illusion: the explanation of the phenomenology of illusion (why do I seem to see P when I am related to an object which does not instantiate P?) and the satisfactory account of error in illusions. And I will claim that in both cases relationalism does not give satisfactory solutions to these problems and for these reasons the intentionalist account of illusions stays the more attractive one.

2. The Relational View of Illusions

2.1. Blindness and Illusion

For an adequate explanation of illusory perceptual experience, it is important to distinguish illusions from other types of perceptual experiences which are not illusory and deceptive. I will claim here that there are two different ways perception can fail. Perceptual experience can fail to present certain properties. In this case we have no phenomenal experience of these properties. They do not enter into our experience or are not represented by the experience. This failure is a case of lack of visual acuity, a case of blindness i.e. a case where we do *not* see or we have lost the ability to see certain properties. Such cases have to be distinguished from illusions where we have a phenomenal experience of a certain property, but the property we seem to see cannot, on closer inquiry, be found in the object we are seeing. In the first case our perceptual experience lacks *acuity*, in the second case the experience lacks *accuracy*. I

will claim here that the failure to see certain properties and the failure to distinguish one property from another are due to a lack of acuity. As relationalists reject the view that perceptual experience has content and accuracy conditions, they also reject that illusions should be explained by a lack of accuracy. Therefore relationalists try to explain illusions in some other way. Either they deny that actual cases of illusion involve error or they try to explain the visual failure in the experience of illusions by a lack of acuity. I will claim here that genuine cases of illusion cannot be explained by such a lack of acuity.

Acuity is a gradual phenomenon. My vision can be more or less acute. My capacity to see small objects, to see fine-grained differences of shade or to hear sounds can be more or less sharp.[52] Acuity depends on the constitution of the perceptual system. The perceptual systems in different animals show different degrees of acuity: humans can hear 340.000 different sounds in the range from 15 to 15.000 Hertz. But cats can hear a more extended range of frequencies (from 30 to 70.000 Hertz) and the barn-owl has, compared to humans, a much higher acuity in the precise localization of sounds (Thompson 2000: chap. 8). Perceptual acuity varies also gradually with circumstances, either those external to the organism or internal to it. It diminishes gradually with the distance from the observer to the objects. The farther we are away from an object the less can we see the properties the object has. Acuity can diminish with fatigue, external circumstances (fog), aging of or damage to sensory organs. A typical case of diminished acuity is blindness. Color blindness is for example a diminished capacity to see and to distinguish colors. Acuity is connected to the capacity to distinguish between objects or between properties. The more acuity our perception has, the more properties can we see and the more are we capable to distinguish between them. Let us take the example of a distant tower. With greater acuity, we can not only see the two-dimensional contour of the tower, but also its three-dimensional shape. We see the tower for example as round. This increases also our capacity to distinguish a round tower from a square tower, a capacity we would not have with less acuity. When we lack acuity, we may be incapable to distinguish the round tower from the square one.

Accuracy is also a gradual notion in the sense that our perceptual experience can be more or less accurate. This distinguishes accuracy conditions from the truth conditions of sentences or propositional attitudes. A belief is either true or false. A perceptual experience can be partially non-veridical. I can for example see accurately the shape, size and texture of an object but inaccurately its color. Such an experience is partially accurate and partially inaccurate. But accuracy means an absence of error and accurate experiences are completely

[52] Siegel (2010: 32) emphasizes that acuity can be characterized by the degree of resolution; low acuity would be a low degree of resolution.

true (Siegel 2010: 30-33). If the properties represented in experience meet the accuracy conditions, then the experience of that property is simply true, not only to a certain degree.

The fact that the accuracy of experience is gradual has to be clearly distinguished from the fact that our perceptual experience has acuity only to a certain degree. Our perceptual senses have no perfect acuity, but this does not imply that perceptual experience is only partially accurate. Traditionally some philosophers have defended that position: for them (Leibniz 1704 and Locke 1700) only perfectly acute experience can be accurate.[53] Only if we distinguish all the properties of an object and represent them clearly, only then our perceptual experience is accurate and free of error. This is a much to strong constraint on accuracy. On this condition only a being with perfect acuity or infinite perceptual powers can have accurate perceptual experiences. We would not accept such a constraint for the content of beliefs, because it would imply that only a complete description of whatever object or fact we represent in our belief can be true. But there is no reason to think that a belief with a richer content is more accurate than one with poor content. Why should the belief "There is a cat" be less accurate than the belief "There is a black cat with a brown tail". What the belief represents, and with how much detail, is just independent of the question whether that content is true.

Acuity is *independent from accuracy*. Acuity says something about the richness and the fine-grainedness of perceptual experience, but it does not say anything about the accuracy of that experience. If we do not see certain properties of external objects, this does not imply any error or illusion in visual perception. *Not seeing* something does not imply that we *see* something *wrongly*. A lower level of visual acuity does not involve error and highly acute vision can be inaccurate or erroneous. A blind person capable only to distinguish luminous and dark areas in his environment can be perfectly accurate in his visual experience. He experiences this part of his environment as darker and it is darker and that part as brighter and it is so. His experience lacks acuity but is perfectly accurate. What he represents satisfies the accuracy conditions and is therefore a veridical experience. A person with very sharp visual acuity would not be immune against visual illusions and perceptual misrepresentation.

As relationalists want to avoid saying that perceptual experience is erroneous, they have the tendency to reduce cases of illusion to cases of diminished acuity. They explain illusions by a failure of perceptual contact or failed acquaintance with the perceptual object. For them perception can fail to present certain objects or properties, but perception cannot be wrong. I will claim here that the failure of perception due to a lack of acuity is different from

[53] Siegel (2010: 32 n.5) refers to some philosophers who conceived accuracy as acuity, so Locke (1700/1975: book 2, chap. 12, sec. 14) and Leibniz in his *Nouveaux Essais* (1704/1996: II, 23, § 12).

the failure in illusion. Illusions cannot be reduced to failed perceptual contact. Illusion appears when perceptual experience presents some property which is not instantiated. This does not depend on any degree of acuity. A highly precise and fine-grained visual experience can be an illusion. Intentionalism usually describes this kind of perceptual failure as inaccuracy. As relationalists reject the view that experiences are accurate or inaccurate, they need another account of illusions. But given the independence of acuity from illusion and error, the relationalist cannot explain the failure in illusions by a lack of acuity.

2.2. Relationalist Explanations of Illusions

There are different strategies to deal with illusions from a relational point of view. I will distinguish here three ways. All three ways try to avoid the conclusion that we are related to a property which is not instantiated in some external object or that we are related to an (intentional) object which is not actually present. The first of these relational strategies is the *denial of illusion* (1): It can be denied that a perceptual experience which is typically described as an illusion actually is one. The phenomenology which seems to be erroneous can be contested. Secondly, there is the *failure to see* (2): Illusion can be redescribed as a failure to see certain properties of the object we are seeing. The object instantiates for example the property Q, but I am unable to see that property Q. And finally the *failure to distinguish* (3): The object has a certain property and I see that property, but I am unable to distinguish this property from other similar properties. I see for example a cat from far away, but I am unable to distinguish it from a dog. Because of that inability, it may seem to me that I actually see a dog. The first strategy just denies that there are illusions and that there is some kind of failure involved in our visual experience, but (2) and (3) acknowledge that there is some failure involved in some cases of perception. I will discuss at the end of this section, if these types of perceptual failures actually can explain the typical cases of perceptual illusion usually discussed in psychology (cases like the Müller-Lyer or the Hering illusion). But before that, let us look more closely at the way relationalists use these three strategies in order to avoid the intentionalist explanation of illusion by representational content.

(1) *The denial of illusion*: Relationalists often insist that many examples of perceptual illusions discussed by philosophers are not actually cases of illusion. Ayer classified for example the fact that objects appear under many perspectives as cases of perceptual illusions (Ayer 1956, chap. 3). A coin appears slightly elliptical from her and massively elliptical from there, but it is actually circular, not elliptical. If that is a case of illusion, than perceptual experience is massively illusory. And if we say that we have the perceptual experience of

ordinary objects like chairs and tables while what we actually see are concatenations of atoms, then all perception is a form of illusion. On such a view the manifest appearance of all objects of perception is an illusion (Eddington 1928).

The relationalists are right to criticize the extensive application of the concept of illusion to many or most perceptual experiences (Austin 1962, Travis 2004). Noë (2004: chap. 3.3 and 2006) for example contests that some kind of illusion is involved in the fact that objects look different from different perspectives. For him, objects do not only instantiate intrinsic properties, but also "perspectival properties". Schellenberg (2008) defends similar properties of objects she calls "situation-dependent properties". These properties depend only from the intrinsic properties of the object and situational features like distance from the observer or illumination. Let us look at Noë´s version: A round coin does have the objective perspectival property to look elliptical from that specific point of view. From that perspective, the coin covers an elliptical shape in the visual field of any observer or on any display of a camera. If we admit that objects have such perspectival properties, then our perceptual experience can be a relation to such perspectival properties. The fact that these properties appear in that experience does not involve any illusion or error in our perceptual experience. The fact that the coin looks elliptical is not a perceptual illusion, because its "ellipticality" is a perspectival property of the coin. It is also in accordance with our everyday understanding and our common sense classifications of illusions to exclude this change of the visual appearance of objects which themselves do not change from the category of illusions.

Perspectival properties and situation-dependent properties are mind-independent relational properties (Schellenberg 2008). They depend on the relation between the intrinsic properties of objects and properties of situations or points of view. They are different from subjective and mind-dependent properties, like for example secondary qualities (if these are defined in a relational way). These mind-independent relational properties are objective, because they depend only on the objective features of external things and situations. But there are illusions where the property we see can neither be explained by the intrinsic properties of the object nor by taking into account perspectival or situation-dependent properties i.e. the appearance of the object given a certain illumination and distance.

Some relationalists go further and try to describe typical cases of illusion in such a way that the illusory and erroneous component of the experience disappears. Brewer (2006) gives such an account of the Müller-Lyer figure. In psychology that figure is typically classified as an illusion. In it, lines of equal length appear to have different lengths. That figure corresponds to the definition of an illusion I gave above: Each line appears to have a

specific length (P), but actually has a different length (Q), either longer or shorter than it appears. Intentionalism can explain that phenomenology by saying that the two equal lines are represented as lines of different length. But a relationalist like Brewer who wants to explain the phenomenal appearances by the relation to external objects has a problem with such a phenomenology. Brewer thinks it possible to contest that the two lines in the figure appear to have different lengths. The appearance of unequal lengths, so Brewer, is contradicted by the fact that, when we focus on any of the endpoints of the lines, they appear exactly at the place where they actually are. Given that they appear at these locations, the two endpoints of each line appear at an equal distance of each other. But this contradicts the fact that they appear to have different lengths. Brewer concludes that the intentionalist must suppose that the figure is represented at the same time as equal and as unequal in length. He must attribute an impossible content.

An *impossible content* is not per se an objection to intentionalism. There are other illusions with contradictory content as for example the waterfall illusion[54] and it seems no bigger problem to attribute a contradictory content to perceptual experience then to attribute such a content to belief. But besides this point, it is quite contestable to claim in the Müller-Lyer case, as Brewer does, that the lines do not look to have different lengths. It seems quite arbitrary to contest the phenomenology most people report. A lot of perceptual illusions are constructed on the same model; two equal objects (lines, patterns, colors) are shown in different contexts and appear phenomenally different. In the Hering illusion (Figure 1) and the Wundt illusion (Figure 2) two equal lines appear to have different shapes and in the Checkerboard illusion (Figure 3) two square of the same grey appear as white and black respectively.

[54] The waterfall illusion is a motion aftereffect. If one looks for some time at a moving stimulus (for example a waterfall) and than looks at a stationary object, this object seems to move in the opposite direction. At a certain moment we experience the object as stationary and as moving at the same time.

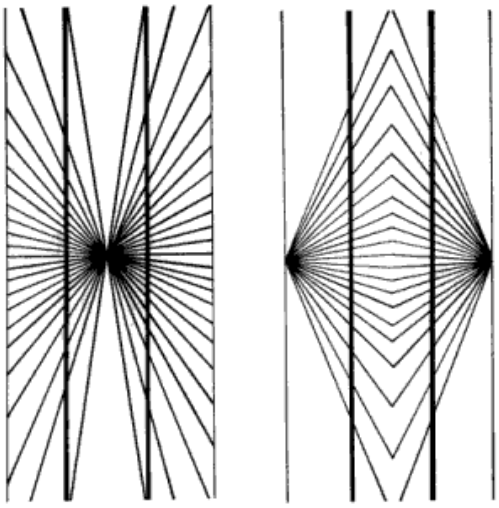


Fig. 1 and 2: Respectively the Hering and the Wundt illusion. The straight lines appear to have different curved shapes.

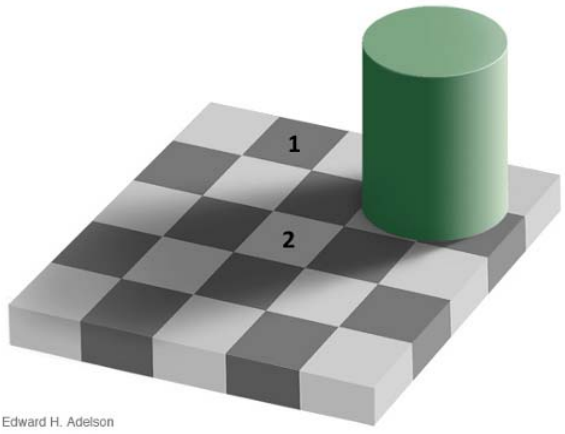


Fig. 3 Adelson´s Checkerboard illusion: Square 1 and 2 have the same shade of grey, although they look different.

It would be quite hard to deny in all these cases that these objects (lines or surfaces) do not appear phenomenally different. The denial of illusions also cannot explain the surprise people usually show, when they discover that the difference they seemed to see is not there. The surprise of people confirms the illusory phenomenology. If people did not wrongly see the lines as different, they would show no surprise when they are told that the lines actually are not different. So, there are cases like the perception of perspectival properties, where it can be sensibly denied that we are in presence of an illusion, but it would go against the largely acknowledged phenomenology to deny in such a way *all* illusions. The denial of illusions can hardly be extended beyond certain specific cases of apparent illusions.

(2) *The failure to see*: When we see an object there are a lot of its properties we just do not see, hidden sides or the components beneath the surface of the object. It would be obviously absurd to claim that we have illusions because objects instantiate properties we do not see. In that case every perceptual experience would be non-veridical. But the two conditions of illusion I stated above (in section 1.3) say that there is an illusion, only if a property is presented in experience, but is not instantiated. Contrary to the case of illusion, properties which are not even presented in experience do not pose a problem for a relational view. We can just say that we are not related to them. Noë (2006 and 2012) tries to reduce the cases of illusion to such cases of failure to see something. If that strategy succeeds, the problems posed to relationalism by illusions would disappear. Noë gives the example of the perception of very distant objects like the stars in the sky (Noë 2006: 49). In that case, so his claim, our perceptual relation to these objects breaks down because of the huge distance. He insists especially on the fact that size constancy breaks down at large distance. Size constancy

in normal visual perception explains why large objects at distance appear bigger than their projected size would let suppose. A house at distance seems still big although its projected size may not be bigger than the book in front of me. But in the case of the stars, we see huge objects as tiny spots. Here, a normal perceptual relation breaks down. So, we cannot say that we stand in a perceptual relation to the stars; we just stand in such a relation with events caused by these stars, namely traces of light at a certain, much closer distance. Given this understanding of our perceptual relation to stars, it is no objection to relationalism to say that we experience stars which are extinct. We have no illusory perception of stars which are actually extinct, but we perceive veridically near traces of light coming from these extinct stars. For Noë, it is not these absent stars which enter my experience but the actually present traces of light. In the same way, we have no visual illusion, when we see the houses and cars from a plane as tiny objects, although neither cars nor houses are tiny. Here also, the perceptual relation fails.

Can this kind of explanation be extended to other cases of illusion? Noë seems to do so in the case of a classical example of an illusion: a straight stick in the water which is seen as bent.[55] It is not totally clear how to interpret Noë´s brief discussion of that case (Noë 2006: 52), but Noë suggests that this case can be explained in a similar way than the case of the perception of stars. How could such an explanation go? It must say: I see the stick, but I cannot see all its properties. In the specific case of the stick, it is the shape of the stick which I seem to see wrongly as bent. Given that the stick is not bent but straight, I cannot stand in relation to its actual shape property. That property (shape) does not enter into my experience and I do not stand in a perceptual relation to it although I do stand in such a relation to the stick and its other properties. Therefore, in this case we avoid the situation described above by the two conditions for an illusion, namely that a property P (shape) is presented in experience but not instantiated in the object we see. Here, the exact shape of the stick (P), just is not present in my experience. I could see the distance of an object without quite seeing its shape. But given that shape is such a fundamental property of objects, how could I see the other properties of the stick, its color, texture, length or thickness and fail to see its shape. Color and texture fill out the shape of the stick, length and thickness are aspects of its shape. I could not see a stick and fail to see its contours. The explanation of illusion by the failure of seeing does not work in this case.

On the other hand, Noë admits that we “misperceive the spoon as bent in the water” (Noë 2006: 52). The above explanation of the perception of the stick by the failure to see,

[55] Ayer (1940) discusses this example of the stick as an illusion. Austin (1960) already discussed that example and contested that it is an illusion.

does not even touch the question how we can "misperceive" something. Misperception implies that we perceive something falsely. And this erroneous perception must be either explained or explained away by relationalism. The failure to see as in the case of the stars cannot do so. The failure to see something does not imply that we see something wrongly. In a case of failed seeing, we do not wrongly see some property Q (straight stick) as property P (bent), but do not see the property P or Q at all. The failure to see cannot explain the phenomenal difference there is between seeing a bent stick and a straight one (between property P and Q). I see a straight stick as bent and that is phenomenally different from seeing it as straight. It is not the case that I do not see its shape, but I inaccurately see its straight shape as bent.

Even if in the case of the stick in the water the explanation by the failure to see does not work, there are many cases were such an explanation is possible. But in these cases it explains only cognitive error, not perceptual error or illusion. Let us take Austin´s example of a soap lemon which looks like a real lemon (Austin 1962: 50). I do not see the properties which distinguishes that fake lemon from a real one. I see only properties it shares with real lemons (color, shape, size, texture) and I am not in anyway wrong about these properties. I am wrong when I conclude from these properties that the soap lemon has also the other properties real lemons usually have. But drawing that erroneous conclusion is a *cognitive* error, not a *perceptual* error. So, the failure to see can explain cognitive "illusions" (false beliefs), but not perceptual ones.

(3) *The failure to distinguish*: the most important strategy of relationalists confronting illusions is based on the claim that our perception is in some ways indeterminate. Travis´ argument from indeterminacy says that the appearances do not determine a supposed representational content in a precise way (Travis 2004). When we have the appearance of a colored object, we cannot attribute to that perceptual experience the content "red apple", because the appearance is similar to or even indistinguishable from other objects and other shades. Travis argues that it is only our thoughts or judgments which give a specific content ("red apple") to mental states, but perceptual experiences themselves do not have such a content.

Brewer (2006 and 2008) applies a similar reasoning to the case of the Müller-Lyer figure. What I called the "denial of illusion" was one possible account presented by Brewer to avoid the intentionalist consequences from illusions. Brewer gives a second possible account of that figure which would equally avoid these consequences. Brewer´s second account is the following: The perceptual experience of the Müller-Lyer figure is a direct relation to the

actual lines on the piece of paper. The lines themselves enter into my experience and these constituents of my experience happen to be of equal length. But at the same time, I am unable to subjectively distinguish that experience from an experience of two unequal lines (without hashes at the end of the lines). So, I have the experience of two *equal* lines which happen to be not only similar but also subjectively indistinguishable from two *unequal* lines. The subjective indistinguishability here does not mean that they are by no means distinguishable. It is easily possible to distinguish them by measuring them. It means only that I cannot distinguish them by using introspection and reflection alone. In the two perceptual experiences of the equal lines and of the unequal lines, I stand in a perceptual relation to different objects, but as my experience is not totally transparent to me, I am unable to distinguish subjectively the two experiences. Therefore, I am also unable to tell, if I experience equal or unequal lines. The threat to interpret the perceptual experience of the Müller-Lyer figure as a misrepresentation is also avoided. The experience is a relation to the actual lines and these lines are quite similar to unequal lines so that it is easy to be mistaken about what we actually experience. The mistake is not one of the perceptual experience but is situated at a higher level. The experience itself is not wrong, but I am wrong about my experience. My thoughts about the experience are wrong.

The problem with that explanation of the Müller-Lyer case is that it presupposes that my perceptual experience is ambiguous and that I cannot tell whether the lines are equal or unequal. The experience is described as ambiguous and this ambiguity explains why it is easy to be mislead by it or to take it for what it is not. But that seems a curious redescription of the phenomenology of the experience in the Müller-Lyer case. It is not so that I cannot see whether the lines seem equal or unequal, they immediately struck me as unequal in length. And I am surprised when I hear that they are not unequal in length. They do not “look like“, or seem to be “similar” to lines of equal length.

There are perfectly good cases in perception where such an ambiguity exists. Let us take again the case of a the distant tower. I cannot tell whether it is a round or a square tower. Either I only see the two-dimensional contour of the tower, but cannot see its three-dimensional shape at all, or at least the depth cues are ambiguous and I cannot visually distinguish its shape. In that case either the three-dimensional shape of the object does not enter into my experience or the perceptual experience is ambiguous. But this is not the case in the Müller-Lyer figure. Here I clearly experience one line as shorter than the other. I see a phenomenal difference between the two lines. Specifically *that* phenomenal difference represents a problem for relationalism, because there is no corresponding difference in the

perceived objects. That phenomenal difference cannot be explained by a difference in the objects I am related to in perception. Brewer assimilates the case of illusion to the case where we do not see a certain property or only see it in an unclear, ambiguous manner, as in the tower example. He assimilates an illusion to a failure to see a certain property.

There is a phenomenal difference in the appearance of the upper and the lower line of the Müller-Lyer drawing: the upper line looks longer than the lower line. As I noted before, many perceptual illusions in psychology are constructed on the same model than the Müller-Lyer figure. Two objects (for ex. lines) which share a certain property are presented and they seem to differ in that property (color, shape, size). The experiences of the two objects are clearly subjectively *distinguishable*. That phenomenal difference in the appearance of the two objects poses a problem for relationalism, because it cannot be explained by a difference in the objects. Brewer tries to assimilate these cases of perceptual illusions to the case encountered in the argument from illusion. There, two objects which are ontologically different are subjectively indistinguishable. It was presupposed in the argument that we do not notice a phenomenal difference in seeing both objects (the veridical and the illusory case). Brewer compares the Müller-Lyer figure to another drawing which is ontologically different, two lines of different length, but does not seem to differ phenomenally. He concludes that subjective indistinguishability of ontologically different objects is no argument against relationalism. Indeed, indistinguishability neither implies that the objects of experience are the same, nor that we must have the same perceptual experience. Brewer avoids the threat for relationalism coming from the argument from illusion. But he does not address the threat coming from illusion more generally, namely the fact that objects instantiating the same properties (ontologically similar) seem phenomenally different. How can that phenomenal difference be explained by the relational view? This question stays open.

So, in the case of a failure to distinguish, we see two different properties, but are unable to distinguish them. Our visual acuity is not sufficient to see that difference. We may see two different shades of blue which could be distinguished by someone with higher visual acuity. But given our weaker acuity, we do not see the difference between, say, $blue_{37}$ and $blue_{38}$. We have only a capacity to distinguish for example 30 shades of blue, but not such fine-grained differences. The fact that we fail to see the difference is not a case of perceptual error, of a perceptual experience which fails to be accurate. If perceptual illusions are just such cases of failure to distinguish (a failure to distinguish equal from unequal lines in the Müller-Lyer illusion, a failure to distinguish straight from curbed lines in the Hering and Wundt illusion), then illusion does not imply error. It would just be a lack of acuity, but not an

inaccurate perceptual experience.

There are *two types of perceptual illusions*: either we see objects with different properties and they seem the same to us, or we see two objects which share a property, but these objects seem different to us (see Fig. 1-3: the lines share their shape property, the patches share color). The first type shows *phenomenal indistinguishablilty*: the two properties seem phenomenally the same. The second type shows a *phenomenal difference*: the same property appears phenomenally different (the lines in Fig. 1-2 and in the Müller-Lyer figure, the shade in Fig. 3). In the first case where different properties appear to be the same, two interpretations are possible. One can say that we do not misrepresent any of the properties, but are just unable to distinguish them. Although the object of $blue_{37}$ and the object of $blue_{38}$ have different properties, they are seen as the same shade of blue, due to a lack of acuity. Another interpretation is that we do not distinguish the two shades, because we represent one shade, say $blue_{37}$, wrongly as $blue_{38}$. Both seem the same because one shade is misrepresented by perceptual experience. In one interpretation, the indistinguishability is due to a lack of visual acuity, in the other interpretation it is due to a misrepresentation and to perceptual error, a lack of accuracy of our perceptual experience. In such cases of indistinguishability, the relationalists opt for the first interpretation and thus avoid the attribution of error to perceptual experience. But in the second type of illusions, the one where we experience a phenomenal difference while seeing the same property, such an option is not possible. Two objects having the same property appear to differ in that property. Two lines of equal length appear to differ in length. In that case of illusions, it is not possible to appeal to a lack of acuity and to a failure to see (we do see the length of the lines in the Müller-Lyer case) or a failure to distinguish (we do phenomenally distinguish the length of the lines). In this case the relationalist three strategies to avoid the attribution of error to perceptual experience do not work.

To summarize, we can say that relationalists give three solutions to the threat represented by the two conditions of illusion defined above (i.e. (1) an object looks P, (2) it does not instantiate P, but Q). The first condition said that an object appears to have property (P).That condition is changed in the following ways:

Denial of illusion: (1) The object appear to have property Q (not P).

Failure to See: (1) The object neither appears as P nor Q.

Failure to Distinguish: (1) The object appears to have property P and P is subjectively indistinguishable from Q.

And in all three cases: (2) The object does not instantiate property P (but property Q).

In all these three cases, the mismatch between the first condition and second condition, the fact that the object we see actually instantiates property Q and not P, is avoided.

But none of these three solutions can avoid a central feature of such illusions as the Müller-Lyer figure. Objects instantiating the same property appear to be phenomenally different. In the Müller-Lyer illusion we have the following situation:

(1) Object X appears to have property O and object Y appears to have property P.
(2) Both object X and Y instantiate property Q.

X and Y are the two lines. One appears as short (O) and the other as long (P). It may be that none of the lines is seen as it is (in that case O and P are different from Q), or it may be that at least one line is seen as it is (either O or P is identical with the length the lines actually instantiate, Q). But as O and P appear as different lengths and are phenomenally different, it cannot be that the actual lines instantiate both of these mutually exclusive properties. The Müller-Lyer illusion is an illusion about size, but illusions which present exactly the same situation have been constructed for other perceptual properties (shape, color, distance etc.). So, the problem presented here potentially extends to most features presented in visual experience. The three relationalist responses to the problem of illusions described here offer no solution for this problem posed by the Müller-Lyer illusion and similar illusions. The illusion cannot be *denied* by saying that both lines appear to have the same length. Given that we notice a difference in length, it cannot be claimed that we *fail to see* the length of the lines. And for the same reason it cannot be claimed that the lengths of the lines are *indistinguishable*. This phenomenal difference cannot be plausibly explained by a difference in the object. But there is still another option for relationalism. The phenomenal difference can be explained by a non-perceptual mental state. I turn to that option in the next section.

3. Explaining Error

3.1. The Location of Error: Attitudes and Content

Relationalism rejects that our perceptual experience can be accurate or inaccurate. Perceptual experiences do not have accuracy conditions and therefore there are no conditions under which they would be erroneous. On the other hand the notion of perceptual illusion involves error. When I have a perceptual illusion, I am deceived about the world and I am led to false beliefs about certain objects or properties in my environment. But if perceptual experience itself cannot be erroneous, as the relationalists claim, the error must lie in some other mental state different from the perceptual experience itself, in some higher order mental state. This is an option many relationalists take in order to explain illusions. I call here higher order mental state any state which is about my perceptual experience, beliefs, thoughts or awareness of that perceptual experience. Such a mental state of a higher order can be a propositional attitude about the experience or it can be the awareness of having that perceptual experience.

To take the first case, we can have a *propositional attitude* about the experience: I can believe falsely that I have a perceptual experience of unequal lines when I have actually an experience of equal lines (to take again the Müller-Lyer illusion). In that case I have a false belief, a false propositional attitude about my experience, but the experience itself needs not to be erroneous. Secondly, we can have an erroneous *self-awareness*. It can seem to us as if we had an experience of unequal lines although we actually experience two equal lines. In that case our self-awareness is erroneous, but not the experience itself. I will discuss these possible explanations of error by higher order mental states in the following section (3.2). But before a discussion of these explanations of error, we have to question the presupposition which underlies these explanations of error. The presupposition that error must lie in higher order mental states, because only these states can be representational while perceptual experience is not representational and therefore not susceptible of errors. So, I will first discuss the assumption that error cannot be attributed to perceptual experience itself (in this section), and then I will discuss if errors which seem to be perceptual can be better explained by higher order mental states (3.2).

There are some positions in the philosophy of mind, which reject generally a semantics for mental states. A purely syntactic theory of the mind as it was defended by Stich (1983) or specific philosophical interpretations of dynamic systems theory (Van Gelder 1995) questioned generally the attribution of semantic properties to mental states. They questioned that mental states can be true or false, accurate or inaccurate. They questioned that mental

states can be semantically evaluated. And they questioned the use of the concepts which involve semantic properties in an analysis of the mind, the concepts of representation and of mental content. Relationalists are not such radical anti-representationalists.[56] Their rejection of representation and representational content is based on a specific view about perception and does not extend to other mental states like beliefs, desires or mental imagery, dreams and other hallucinations. Generally, for relationalists all these latter mental states are mental representations, they have content and can therefore falsely represent something. I already indicated some motivation to deny this for perceptual experience in veridical perception and illusion. Here I will discuss one further motivation.

When we see an object, we stand in an actual relation to that object and when we see an object, we have a perceptual experience of that object. Is that a reason to believe that perceptual experience itself must always stand in a relation to an object? We have to distinguish here between perception as the state of seeing, i.e. seeing an object from perceptual experience.[57] Perception is a state which is more complex than having a perceptual experience. When I perceive (see) some object, I have not only a perceptual experience of that object, it not only seems to me a certain way, but I stand also in an actual relation to that object which is before me. I cannot see a cat, if there is no cat in front of me. In that sense, having a perceptual experience of a cat is not sufficient to see a cat. An actual relation to a cat is a further condition for seeing, for the perception of cats. In that sense, perception is a factive state. Perceiving an object implies the existence of that object. Perception as a factive state is in that sense similar to action: I cannot ride a bike if there is no bike and I cannot hit a ball if there is no such round object before me. Relationalists take that analysis of *perception* as paradigmatic for any analysis of *perceptual experience*, the experience I have when I perceive, but that I could possibly have when I do not perceive, i.e. when I do not actually see an object or property. For them, having a perceptual experience implies standing in an actual relation to an object. But does the perceptual experience of a certain object imply the existence of that object in my environment? There is a suspicion that relationalists infer that perceptual experience is a relation to an actual object because the state of seeing always involves a relation to an actual object.

Noë (2004: 96) defends for example that perception is touch-like and active. For him perception should be analyzed on the model of the active tactile exploration of the environment. It is quite plausible to say that exploring or touching X implies that there is

[56] For a recent discussion of radical anti-representationalism, see Chemero (2009).
[57] For simplicity I speak here only about perception as seeing, but seeing can here be replaced by hearing, touching and the other sensory modalities.

some X. After all, touching and exploring is an activity in relation with X, as biking is an activity in relation to a bike. But Noë claims also that perceptual experience involves a relation to the experienced object. It seems often that the relationalist view of perceptual experience derives its force from the relational nature of the situation of perception, from the relational nature of the state of seeing. But given that perception is a relation, it does not follow that perceptual experience is relational. Given that the state of seeing always involves an actual relation to an object, it does not follow that one of its components, namely perceptual experience always involves such a relation. We can for example hit a ball while we believe hitting the ball. Even if the action involves a relation to the ball, the mental state of believing does not. The belief can occur independently of the action and the actual relation to the ball. And the relationalists would admit that. They accept that beliefs are representational states and can be false. Quite similar is the situation when I hit the ball while feeling that I hit a ball. But here again the mental state, the experience, could occur independently of the actual relation to the ball. There is no reason here to suppose that the experience is dependent on the actual relation to the object while other mental states like beliefs are not. So, what stronger motivation is there to assimilate the perceptual experience to such a relational state, the state of seeing?

It can be argued that perception is similar to a factive propositional attitude, similar for example to knowledge. Having the attitude of knowledge implies that we have a true belief. It implies that the propositional content the attitude is related to, is true. Similarly, it can be claimed that perception necessarily implies that one stands in an actual relation to the seen object and implies having a veridical perceptual experience. I exclude here for the sake of the argument the possibility of unconscious perception, i.e. perception which is not accompanied by any phenomenal experience (as for example in blindsight). As seeing implies an experience and a relation to objects, any perceptual experience I have *while seeing* something stands in an actual relation to the seen object. But from the fact that the content in knowledge cannot be false, it cannot be concluded that knowing involves no representational content, no content which could be false.

Action can be accompanied by different beliefs, either true or false ones, but perception of an object involves a perceptual experience of that object. In that sense perception (as the state of seeing) is factive, like knowledge. Knowledge as a factive attitude implies a true content. And similarly perception implies an experience which actually stands in a relation to the perceived object. In perception (as a state of seeing), the content of the experience cannot be false. Is that a reason to deny that perception has representational

content? No. First, even if the content of a factive attitude cannot be false, its content can be a representational content. In the case of knowledge, we still have a belief with representational content. Belief has a representational content, even if the belief is necessarily true, as in the case of beliefs in analytic propositions. So, the fact that perception implies experiences with a content that cannot be false does not exclude that the content is representational. Secondly, even if perception is taken as the standard case for perceptual experience, it cannot be excluded that we have a similar perceptual experience when we do not stand in a perceptual relation to objects, when we are not in the state of seeing. Similarly, if knowledge involves a true belief, we can have the same belief without that factive attitude. Having that attitude implies that the content associated with that attitude is true. But we can have that content independently of the attitude. And that content could be false. In the same way perception (as a state of seeing) implies having an experience which stands in a relation to an object. But having that experience does not imply that one stands in such a relation. So, we cannot infer from the relational character of perception (as a state of seeing) to the relational character of perceptual experience. In a similar way, we cannot infer from the properties of an attitude to the properties of the content attached to that attitude. If an attitude is factive, we cannot conclude that the attached content must be true in all circumstances. It is not a property of that content to be always true. Attitudes can have other properties like polarity, direction of fit or complexity. But it is a mistake to transfer these properties of the attitude to the content. Relationalists proceed in such a way, when they conclude from the properties of the state of seeing that the content of perceptual experience must have the same properties.

It is an open question whether perceptual experience is relational. The fact that perception (as a state of seeing) is relational does not show that perceptual experience is also relational. Even if perception is factive, this cannot exclude that perceptual experience might be erroneous and that perceptual experience has representational content.

3.2. Illusions as Errors of Thought

The strongest argument against a relational view of perceptual experience is the fact that illusions are considered to be errors. A relation can only obtain or not obtain, but cannot be erroneous or false. We saw in section 2 how relationalists tried to avoid the conclusion that perceptual experiences involve error. But in cases like the Müller-Lyer figure where different properties are presented in phenomenal experience although the things we perceive have the same property, it is impossible to avoid the conclusion that we are deceived about the object

we see. Now, if illusion implies error, then a relational view is only plausible, if the error in illusions can be explained without attributing error to the perceptual experience itself. The error must be explained by some other mental states. Travis (2004), Brewer (2006 and 2008) and Noë (2006) attribute error only to perceptual judgments and beliefs or other non-perceptual mental states, but not to perceptual experience. Noë (2006) and Martin (2004) also explain error by an erroneous self-awareness. We have a certain perceptual experience, but we are wrong about the experience we have. It seems to us as if we had a different experience. Our self-awareness of the phenomenal states we are in is fallacious. Let us look first at these two types of explanation of error by higher order mental states and then look at the problems of these explanations.

Once it is accepted that illusion implies error and that in cases of illusion, we have mental states which deceive us about our environment, it is necessary to explain error. Travis (2004) and Brewer (2006 and 2008) accept that perceptual experience can be misleading, but only because we are mislead about the experience we have. When we see the Müller-Lyer illusion, the perceptual experience has to be explained, in the relationalist framework, by the relation to the actual object before us. So, we have in this case an experience of two equally long lines. But we can be wrong about the experience we have. Our experience can be undistinguishable from an experience of unequal lines. The two experiences are different, but we cannot subjectively distinguish between them. Given this indistinguishability, we can take the experience of the Müller-Lyer figure to be an experience of unequal lines. By "taking" it so, we are wrong, but the error does not lie in the experience, but in the way we take it to be. It is not very clear, what Travis and Brewer mean when they say that we "take" the experience a certain way.[58] But it certainly involves some higher order mental state (a belief, thought or perceptual judgment) and the use of concepts. For Travis and Brewer, when we take an experience a certain way, we apply concepts to the experience. For Brewer, we think that our experience is erroneous, because we confuse the level of thought (or belief), the conceptual level, with the level of perceptual experience. Only at the level of thought and the application of concepts do we represent something and only at that level is error possible.

Is that explanation of error plausible? It is only a plausible explanation for situations, where two experiences are subjectively indistinguishable. Relationalists insist on the fact that indistinguishability between two experiences does not imply that these experiences are the

[58] Travis (2004) generally speaks about „taking" the experience a certain way. „Taking" means apparently in his use making a perceptual judgment, having perceptual beliefs about the experience or expressing the experience in the form of conceptual content. The „mysterious" and „dark" way to express himself does not always make it easy to get what Travis actually means. But our interpretation of „taking" certainly corresponds to what Brewer means.

same. We cannot suppose that experiences are totally transparent to us and that we have infallible access to them (Martin 2004). For me, Italian and Spanish wines (a Chianti and a Rioja) may taste the same way. Nevertheless these could be very different experiences. I may not attend to the differences in the taste of the two wines or I may not be aware of those features which distinguish them. Someone more expert than me can notice strong differences between the two experiences. Experiences can be very different although they appear the same to us. A similar reasoning can be applied to illusions. We can be wrong to think that these two experiences are the same and that they present the same objects or properties. If I see a white wall which looks just like a yellow wall given a certain illumination, then I am wrong to think there is a yellow wall. My experience is a relation to a white wall (and a yellow illumination), not to a yellow wall. Yellow walls and white walls under these conditions of illumination are just indistinguishable and this can mislead me to false beliefs about the actual color of the wall.

This explanation of error does not work for experiences which are phenomenally distinguishable, but where the objects of perception do not actually differ in the properties they seem to have. Relationalists like Brewer explain differences in the phenomenal character of experiences by a difference in the object. If experiences are phenomenally different, they must differ in their object. But in many perceptual illusions, it is difficult to find a plausible candidate to explain phenomenal differences between objects. In the Müller-Lyer case the two lines look phenomenally different. But which property of the lines explains that phenomenal difference in the experience. The equal length of the actual lines cannot explain that the lines appear phenomenally different in length. Either it must be some other property of the seen objects which explains that phenomenal difference, or the difference must be explained by some higher order mental state. The context of the lines could explain the difference in perceptual experience (the arrows at the end of the lines). But how can my relation to the arrows explain the phenomenal difference in the length of the lines? How can the property of one object (the lines) be explained by my relation to some other object (the arrows)? It seems arbitrary to explain the phenomenal difference between the lines by a relation to something different from the lines themselves. And even if this explanation is endorsed, this would not exclude error. I would attribute to the lines a property they do not have, given a property of something else, a property of the arrows.

If the phenomenal difference cannot be explained by some difference in the perceived object, we can still recur to the explanation by higher order mental states. From a relationalist point of view, we experience in the Müller-Lyer case lines of the same length. So, in seeing

the two lines, my perceptual experience does not differ in that respect. But the lines appear phenomenally different, because we “take” one line to be longer than the other. Is it plausible to say that I experience lines in the Müller-Lyer case as phenomenally different, because I erroneously “take” them to be different? But “taking” them to be different, does only mean that I think or judge that they are different. This does not explain why they phenomenally seem different. Thought or erroneous application of concepts does not explain a phenomenal difference in experience. Why does the higher order mental state add anything to the phenomenology? How can it explain the phenomenal difference between two similar objects (the two lines)?

Brewer and Noë claim that beliefs, judgments or more generally conceptual states about the experience can change the way things look phenomenally. Brewer gives Gestalt-switches as examples. Noë (2006) claims that the sensorimotor knowledge or skills we apply to our experience changes the way that experience seems to us. Let us first look at Brewer´s argument from Gestalt-switch cases.

In ambiguous figures like the duck-rabbit, we do not only think alternatively that the figure is a duck or a rabbit, but we experience also a phenomenal change in the figure. This case from Gestalt switches should explain how thoughts can affect phenomenology. That argument depends on the thesis that phenomenal change in Gestalt switches is caused by a difference in thought or categorization. Only then could the illusory perception be attributed to some higher mental state. But this thesis is not well established. There is an alternative explanation of Gestalt switches which explains the phenomenal change in experience by the focus of attention. If we attend to one part of the drawing the figure appears as a rabbit, if we attend to another part, it appears to be a duck. In that case conceptual categorizations would not explain phenomenal change. “Taking” the same object one way or the other would not explain the phenomenal change in the perception of the object. Furthermore, only certain ambiguous figures have the peculiarity to change phenomenally although the object of perception does not change in its intrinsic properties.

But even if the explanation is correct that the phenomenal change in Gestalt switches is explained by our way to categorize the experience, it is doubtful that these cases can explain most illusions. Most illusions do not show any kind of switch forth and back, which could be explained by the different ways we apply concepts to our experience. Brewer´s explanation of the duck-rabbit case is that the figure looks both like a rabbit and like a duck and the way it looks phenomenally depends on the way we categorize that figure. He also argues that the same ambiguity can be found in illusions like the Müller-Lyer figure: is it a

drawing of equal lines or one of unequal lines? But first, there is no phenomenal switch in this case. The figure just appears on way to us without changing. And secondly, even if the figure leads us to doubt whether the lines are equal or unequal, this thoughts about the figure do not have any phenomenal effect. So, even if we follow Brewer and say that the figure is subjectively indistinguishable from a figure of unequal lines, whatever we finally belief about the lines has no effect on the way the figure phenomenally appears to us. Fodor already used this fact about the Müller-Lyer figure in his argument for the cognitive impenetrability of perception. When we come to believe that the figure is an illusion and that the lines, contrary to their appearance, are equal in length, this belief does not change the illusory perceptual appearances (Fodor 1984b). More generally the phenomenal appearance of illusions does not change when we come to know that we are fooled. If we look at Fig. 3, the shades still look different, although we believe now that they are not. And the lines in Fig. 1 and 2 do not straighten out when, after instruction, we come to believe that they are not bent.

It is possible to contest the *cognitive impenetrability of perception*, but it is just not plausible to argue in the specific case of the Müller-Lyer figure that its appearances changes when we change our beliefs about that figure. There are arguments for cognitive penetrability of perception which say that mental imagery can change perception (Macpherson 2012) or that our memory about typical colors for objects influences our actual color perception (Hansen et al. 2006), but neither of these arguments for cognitive penetrability seem to be relevant in our cases of illusion. Brewer´s strategy was to concede that the appearance of the lines is erroneous, and to explain that error by some higher order mental state, belief or conceptual categorization. But this explanation of the appearances is quite implausible.

Noë´s explanation of error by non-perceptual mental states is more plausible, but runs into similar difficulties (Noë 2006). Noë defends, like Brewer, the position that experience is a direct contact with some objects and their properties, but it may appear to us "as if" we were in contact with something different. It may seem to us that we see unequal lines, although we experience equal lines in the Müller-Lyer figure. Noë calls this erroneous appearance the "apparent content". The "real" content for him is just the object or property we are looking at. Apparent content can explain error. And apparent content is not the content of the experience but of our thought about the experience. He states: "On an enactive, non-representational approach to experience, then, an experience is nonveridical when it has a different content than it seems to have, i. e. when what you contact is not what you might have thought" (Noë, 2006: 53). Can thought explain "apparent content" and error? And can thought explain that apparent content has a certain phenomenal character?

Noë´s position has two advantages compared to Brewer. First, if "thought" is conceived as a higher intellectual or conceptual capacity that only higher creatures like humans have, this view would have the awkward consequences that lower creatures cannot be deceived by their senses. Only higher capacities of "thought" would make perceptual error possible (Johnston 2004). Contrary to Brewer, Noë wants to avoid this awkward consequence (Noë, 2006: 48-49). Secondly, on Noë´s view, error can be explained by an application of sensorimotor knowledge or skills to the objects we are in contact with. This knowledge and skills consist in expectations about the way objects change with our bodily movements. Such expectations about sensorimotor changes can be possessed even by lower animals.

Can *sensorimotor knowledge and expectations* explain that things look phenomenally different when they are not? Can Noë´s sensorimotor knowledge explain the phenomenology of illusion? If we apply the same expectations to different experiences, they can seem to be the same. We cannot distinguish between different experiences because we erroneously apply the same skills to them and have the same expectations. And the same object and the same experience can also appear differently to us when different expectations are applied to them. Brewer has a problem to show how beliefs or thoughts influence the way things phenomenally look. Generally he explains the phenomenal character of experience by the object, but in the case of illusions, he must explain it by higher order mental states and that is a problem. On Noë´s view, not only erroneous phenomenology is explained by higher order mental states, but all perceptual phenomenology, in veridical and no veridical cases. An object like for example an apple appears a certain way, not only because we are in contact with its frontal surface, but also because we expect its surface to change a certain way with our movements around it. These expectations explain why the apple phenomenally appears round and three-dimensional. The hidden parts of the object are "present", so Noë, and that "presence" is phenomenally experienced. Higher order mental states have always a part in the phenomenology of the appearances. And the application of erroneous expectations explains why objects phenomenally appear some way they are not. Noë´s theory is therefore much better to explain the phenomenology of illusions by non-perceptual higher order mental states. But he has the same problem than Brewer when it comes to shifting expectations.

Brewer´s explanation was unsatisfactory, because the change of beliefs or conceptual categorizations was not accompanied by corresponding phenomenal changes. Can we find cases where the appearance of the same object changes when our sensorimotor knowledge and our expectations change? The appearance of object changes when we change our physical relation to them or when we are in contact with different aspects or parts of the object. But it

is rarely, or perhaps never the case that their appearance changes when we revise our cognitive states about them. I expect the Müller-Lyer lines to be of equal length, but this does not make them look equally long. Goodale and Milner (1995/2006: 240-45) even showed that perceptual illusions (e.g. the Ebbinghaus illusion[59]) do not affect our sensorily guided movements and therefore do not affect our sensorimotor coordination. The sensorimotor expectations which guide our bodily movements are not fooled by the illusion. Our grasping behavior of a three-dimensional model of the illusion is not affected by the illusion. But in our phenomenal experience, we are still fooled by the illusion. If our sensorimotor expectations were to affect the way things look, than we should not be fooled by the Ebbinghaus illusion. Given this analysis, sensorimotor expectations guiding our bodily movements seem to be independent from the way things look phenomenally. Expectations do not change the way things look. And sensorimotor expectations may even be independent from the way things look.

A further awkward consequence of Brewer´s and Noë´s explanation of perceptual illusions by higher mental states has been emphasized by Johnston (2004). Illusions require a mental capacity which is more complex than veridical perception. Higher order mental capacities are necessary to explain how we can perceptually be deceived. This creates a strange asymmetry between seeing and failing to see: perceptual deception requires higher cognitive capacities than veridical perception. This would also imply that creatures which do not have such higher cognitive capacities could not be perceptually deceived. It is also awkward from an evolutionary point of view that the ability to see deteriorates with the acquisition of higher cognitive capacities.

The explanation of illusion by non-perceptual higher order mental states is confronted with the major difficulty to give an account of the *phenomenology* of illusions. How can things appear a certain way although the things we see are not that way? It is implausible that such a phenomenology can be explained by higher order mental states, beliefs, thoughts or sensorimotor knowledge. This implausibility is increased by the fact that changes in these mental states do not cause changes in the phenomenal character of our experience.

[59] The Ebbinghaus illusion consists of two colored circles of identical size which appear to have different sizes. One circle is surrounded by bigger circles which make it look smaller. The other circle is surrounded by very small circles which make it look bigger. Goodale/Milner constructed 3-dimensional circular shapes corresponding exactly to the circles in the Ebbinghaus illusions (see illustration p. 193). We still misperceive the size of these circular shapes. But our grasping behavior is not fooled by that illusion. Our grip before touching the object predicts fairly well the size of the objects we see. If our grasping behavior would rely on erroneous size information, our grip would deviate from normal. But it does not in this case. The results of these experiments have been countered by some (see Stöttinger et al. 2010 on this debate).

Conclusion

The relational view of perceptual experience develops an alternative view to the representational conception of perceptual experience, i.e. to the content view. But to be a viable alternative, relationalism must be able to explain perceptual illusion without recurring to false representational content of perceptual experience. A plausible view of perceptual illusion is essential for relationalism. There are two ways relationalists attempt to explain illusion. One way is to argue that most cases of illusions do not involve error and therefore do not need to recur to false representational content. Illusion can be reduced to cases where we are unable to see or blind to certain objects or properties and this inability to see or this blindness does not involve any error of perception. We claimed that all cases of illusion cannot be reduced to such an inability to see. Therefore this reduction is not a sufficient explanation of illusions. The other relationalist way to explain illusion is to attribute the error involved in illusions to non-perceptual mental states. If relationalists cannot avoid explaining illusion by error and therefore cannot avoid the attribution of false representational content, it is essential for them to attribute that content to some non-perceptual state and not to perceptual experience itself. We claim that the representational content of such non-perceptual states cannot explain the specific perceptual phenomenology of illusions. In the first case relationalists can explain the phenomenology of illusion as long as it does not involve error. But the attribution of error cannot finally be avoided. In the second case relationalists can explain the error involved in illusions but cannot explain the specific phenomenology involved in illusions. Because of these difficulties for a plausible relationalist explanation of illusions the content view still remains the more attractive explanation of perceptual experience. We will turn to this intentionalist explanation of error and illusion in the next two chapters.

Chapter 4

The Attribution of Content

Introduction

In the next chapter, I will develop a theory of perceptual content which identifies that content with Russellian propositions. Before going into the details of such a propositional content, I will address in this chapter the problem how actually such a propositional content can be attributed to specific perceptual states. Which criteria do we have to say that this perceptual state represents this specific property or this specific object? It is essential to answer this question in order to determine if a given perceptual state accurately represents states of affairs or is a case of perceptual illusion. To distinguish perceptual illusions from accurate perception, we need a method to attribute content. So, this chapter will be preparatory for the next one. It will sketch a theory about the way content can be attributed to perceptual states at all. The next chapter will then analyze what that perceptual content looks like.

I will focus here on the naturalistic theories to determine mental content. They are still the most elaborate and most promising attempts to determine mental content. Naturalistic theories of content try to reduce intentional content to *causal relations* of mental states to their environment, or to *functions* of mental states. When a mental state stays in the right causal relation to some property or object or has a given function, we can attribute intentional content to it. Several naturalistic theories have been proposed. Causal theories explain content by causal relations alone. Teleological theories explain content by the biological or developmental functions a mental state has. Mixed or hybrid theories determine content by causes and by functions. Most naturalistic theories are either causal theories or hybrid theories.

I will defend here a hybrid theory of perceptual content which attributes content to perceptual states due to their causal relations *and* due to the functions these states have in the economy of the mind. I will show that the causal theories alone offer insufficient criteria for the attribution of content. But I will show also that a causal and information relation between environmental features and perceptual states are necessary, although not sufficient for perceptual content. I will therefore criticize teleological theories of content which determine content without looking at these causal and informational relations.

Teleological theories are generally subdivided into those which attribute content of a mental state by the function of the system which produces that state and those which attribute

content by the function of the system which uses a certain mental state. They emphasize either the function of producer systems or the function of consumer systems. I will defend a version of a hybrid theory which combines informational content of a perceptual state with the function of the consumer system of that perceptual state. Although most naturalistic theories of content offer theories of mental content *in general*, I will only attempt to propose a coherent theory for the attribution of *perceptual* content and not a general theory of all types of mental content. I do not claim that this theory of content is also applicable to other types of mental states (conceptual states, emotions, mental images).

After a short section on the conditions for the determination of content, I will criticize in a second part the insufficiency of the existing causal theories. Than in a third part I will stress the problems of teleological theories before I pass in a fourth section to a hybrid theory of perceptual content. In a final section, I will explain how such a hybrid theory of perceptual content can explain failed reference and the intentional objects in misrepresentation, especially in perceptual illusion.

1. The Determination of Content

Different methods have been proposed for the determination of content. First, one can use the phenomenal character of experience to determine its content (Siegel 2010). Secondly, on can look at the role a mental state plays (its functional or inferential role) (Block 1986). Finally, one can look at the causal relations of the mental state to features of the environment. The last method is often called a naturalized theory of intentionality, because it reduces semantic relations (content, reference) to non-semantic relations i.e. causal relations. I think that this last method is still the most promising way to determine the content of perceptual experience and I will therefore focus in this chapter on that method.

A naturalistic theory of intentional content looks at the causal relations of mental states to the features of the environment in order to determine the semantic content of these states. Although the naturalistic theory of mental content has been developed initially to determine the content of concepts, it can equally be applied to other mental states which have content, may that be perceptual states (Matthen 1988, Dretske 1995) or emotional states (e.g. why the fear *of* snakes is about snakes) (Prinz 2004).

A central element of a naturalistic theory of content is the so called *naturalistic constraint* that the semantic notion of content should be explained only by using non-semantic notions. This constraint requires the avoidance of any content-bearing states in the

explanation of mental content, be that language, propositions, propositional attitudes or other intentional mental states. If we explain the intentional content of a mental state by another intentional state, we would get into an infinite regress. We would have to explain how that other mental state (the explanans) gets intentional content. Furthermore the naturalistic constraint requires that the explanation uses only notions which are commonly accepted by the natural sciences. Usually naturalistic theories try to reduce intentional content to causal relations and to functions. It is questionable whether theories which derive content from the phenomenal character still obey the naturalistic constraint. That depends on the question whether consciousness and the phenomenal character of experience can be explained in a naturalistic way. Furthermore, if the explanation of content involves normative notions in a strong sense[60], it is unlikely that the naturalistic constraint can be met.

Naturalistic theories of content are explanations of *non-natural meaning*. Natural signs are regular causal relations between events. If fire always causes smoke, then smoke is a sign of fire. Such signs based on causal relations are called natural signs and they have natural meaning. No smoke can naturally mean fire, if it is not actually caused by fire. So, a natural sign requires the presence of what it means. Therefore natural signs cannot be wrong. There cannot be a smoke which means fire although there is, in this case, no fire. Non-natural meaning requires at least the first criterion for intentionality, the possibility to be about something which does not exist or is not present. Non-natural meaning implies that a sign can have an intentional object which does not exist. Mental states generally have that form of non-natural meaning and that level of intentionality. It is clearly insufficient for a naturalistic theory, if it only explains natural meaning. It must be able to explain non-natural meaning.

I will describe the general idea of such a theory of content and discuss which of the different versions of such a theory is best adapted to explain the content of perception.

2. Causal Theories of Content

2.1. Causal theories and the disjunction problem

The causal theories explain the content of mental states by the events which cause these states. Different versions of the causal theories have been presented. They differ in the specification of the content fixing causal relation between external events and the mental state. Either the content fixing relation is a *statistical relation*, where the type of events which most frequently trigger a mental state is considered part of its content. Rupert´s Best Test

[60] By a normative notion in the strong sense, I mean *prescriptive norms*. For discussion, see section 3.4 of the present chapter.

Theory (1999) and Dan Ryder´s SINBAD theory (2004) are versions of such a causal theory based on a statistical relation. Or the causal relation is a *counterfactual supporting relation* between external events and mental states. Dretske bases such a theory on an informational relation (Dretske 1981). Fodor´s asymmetric dependency theory explains content by a specific type of counterfactual supporting causal relation (Fodor 1990). I will first explain the general idea of the causal theories and then address their problems. I will furthermore claim that a causal explanation is insufficient to solve these problems and to explain perceptual content.

A perceptual state stands in causal relations to its environment. External stimuli cause internal states in the perceptual systems of the brain. A perceptual state stands also in historical relations to its environment in the sense that states of the same type have been caused by external stimuli of the same type in the past. The causal theories of content explain the content of mental states by these causal and historical relations between types of external events and types of internal states. Such a naturalistic theory can be formulated in the following way.

A perceptual state represents the property or the object which "normally" causes it. If the perceptual state S is "normally" caused by the property P, then S represents P. The causal relation can be defined either as a relation between properties or a relation between particulars. If it is defined as a relation between properties, we can say that a property in the environment causes perceptual states defined by a certain property: redness instantiated in external objects causes specific perceptual states characterized by such and such physical properties. In that case these perceptual states of a certain type represent redness. We can also say that particulars of a certain type cause mental or perceptual states of a certain type: if cats cause normally specific perceptual states, then these states represent cats. So, the content of the perceptual state is given by the *normal cause* of perceptual states of that type.

Why is the content of a perceptual state given by the *normal cause* and not by the actual object or property which causes the actual singular perceptual state? Obviously any perceptual state is caused by some physical condition and there is no uncaused perceptual or mental state. If the content of any perceptual state is its actual cause, then perceptual error is impossible. A veridical perception caused by a black cat will have that black cat as content, but also an illusory perception, an experience as of a brown cat, caused by a black cat will have a black cat as content. And a hallucination of a black cat caused by some brain state will have that brain state as content. As in all these cases the represented content does actually occur in the actual world, all these perceptual states are acurate.

It is impossible to define perceptual error on such a simple causal theory. Fodor (1990)

called such a simple causal theory the “crude causal theory”. The *crude causal theory* has the further disadvantage to admit a hodge-podge of different properties and objects as the content of a perceptual state. If the same perceptual state, the same type, can be caused by a black cat, by a hallucinogen or an abnormal brain state, then that state has a disjunctive content of the form: black cat or hallucinogen or brain state of type X. Such an attribution of disjunctive content is quite unsatisfactory. And if a perceptual state has as content a disjunction of all its possible causes, then there is no perceptual error.

This is generally called the *disjunction problem* and more specifically the problem to explain error in representation (the “error problem”). A mental state has intentionality and intentional content only if it has the power to misrepresent. It must have the capacity to represent some property or object although there is no such object or no such property is instantiated. So, the possibility of error is a necessary condition for representation. If every cause enters into a disjunctive content of a mental state, then there is no error. The mental state has a disjunctive content and every cause falls under one of these disjuncts. “Cat”-representations caused by cats and on some occasions by dogs would have the disjunctive content “cat-or-dog“. But if a “cat”-representation is caused by a dog, we want intuitively to classify the tokening of the “cat”-representation as an error. If the mental state has a disjunctive content, we cannot ascribe any error to the mental state. That is the error problem resulting from disjunctive content.

In the case of perceptual representation the disjunction problem reduces to the *problem of error*, although the disjunction problem can also appear without false tokening of a mental representation. If someone asks me about my cat, I will token the concept “cat“ in my thought. It is not an error to token “cat”-concepts upon cat-questions. Still we want to avoid saying that “cat”-concepts represent the disjunctive content “cat-or-questions about cats”. Here, we have a case of the disjunction problem without the problem of error. For that reason the disjunction problem is more general than the error problem. But in perception, tokening a perceptual representation of a cat when there is no cat always involves error. Therefore the disjunction problem reduces to the error problem in the case of perceptual representation.

In order to avoid the disjunction problem and explain perceptual error, it is necessary to distinguish the *content-fixing causes* from other, *wild causes*. We have to distinguish two types of conditions, namely the *normal* conditions where the perceptual state (of type X) is caused by black cats and the *non-normal* conditions where the same perceptual state is caused by brown cats under bad illumination or by black dogs seen from far away. In that case, black cats are the normal cause of perceptual states of that type and neither brown cats nor dogs are.

Given such a distinction between normal cause and other causes, we can easily explain perceptual error. If the property blackness causes the perceptual state of such type under normal conditions, if therefore blackness is the normal cause of that state, then the perceptual state is accurate if its actual cause is something black. It is inaccurate, if its actual cause does not instantiate blackness. If the actual cause is among the normal causes, the perceptual state is accurate, otherwise not.

We can distinguish here between the *content* and the *target* of a perceptual state, following a distinction introduced by Cummins (1996). The target is the object or property we actually see, the actual causes of the perceptual state on one occasion. The content is the object or property which normally causes perceptual states of that type. If the target of a perceptual state is among its normal causes, then the perceptual state is accurate.

All causal theories of mental content follow such a distinction between causes under normal conditions and wild or non-normal causes in order to explain error. To make that distinction, theories of mental content have to introduce, besides the cause, a further condition which explains what "normal" causes or causes under normal conditions are. Nobody defends a "crude causal theory" by explaining the content of a mental only by its causes. Content is explained by the causes and these normalcy conditions which permit to separate the normal causes from other causes, the content-fixing causes from the wild causes which do not contribute to the state´s content. The causal theories of mental content differ in the way these normalcy conditions are defined. The causal theories can be distinguished into the causal-historical accounts which explain the normalcy condition by the causal history and the teleosemantic accounts which explain the normalcy condition by functions, biological or other.

2.2. Solutions to the Disjunction Problem

To solve the disjunction problem, causal theories either specify a certain *type of cause* as the content determining cause (1), or they specify *situations* in which the causes are content-fixing and situations where they are not (2).

(1) The specific content-fixing cause can be defined as the *most frequent cause* of a specific perceptual state (type). In that case normalcy is given by a statistical norm. Rupert defends such a version of a causal theory with his "Best Test theory" (Rupert 1999). The cause which has the highest probability to trigger the mental state is considered as the content of that mental state. To determine that cause, we look at the state which has most frequently

triggered that state in the past. The states with a lower probability are not content determining.

With his *asymmetric dependency theory*, Fodor (1990) gives a different criterion to select the right, content-fixing causes. Fodor distinguishes causal relations which are dependent on other causal relations and those which are not. The content-fixing causal relation is the one which is not dependent on another causal relation. For example, brown dogs would not cause black-cat experiences if black cats never did cause black-cat experiences. There is a dependency of the causal relation between brown dogs and that perceptual experience upon the causal relation between black cats and that experience. There just would not be black-cat experiences, if black cats did not sometimes cause these experiences. But there could very well be black-cat experiences, if there were no dogs causing sometimes such experiences. There is therefore an asymmetric dependency of the dog – black-cat-experience relation upon the black cat – black-cat-experience relation. In Fodor´s theory, the content is given by the non-dependent causal relation (Fodor 1987 and 1990).

(2) Other causal theories do not define a specific causal relation, but a *specific situation* in which the causes of a state are content-fixing. This situation is contrasted with other situation, where the state can be caused by objects or properties which do not enter into the content. Sometimes these theories are called type-one theories, because they define type-one situations which are content-fixing, distinguished from "type-two" situations where causes do not determine content (Neander 2004). I will discuss here the versions of Stampe (1977) and Dretske (1981) of such a type one causal theory and emphasize their problems.

Sometimes the situations in which the causes are content-fixing are defined as *optimal situations*. So, a state may have as its content the object which causes it under epistemically optimal situations (Stampe 1977). The cat-appearance has as its content a cat, because under epistemically optimal conditions such appearances are caused by cats, for example at optimal distance and under good illumination. Under non-optimal conditions they can be caused by other animals (e.g. dogs from far away), but these conditions do not determine content. So, the disjunction problem is avoided.

But it is difficult to define what epistemically optimal conditions are and it is quite arbitrary where to draw a line to non-optimal situations. Furthermore, we have to introduce normative considerations to make the distinction between optimal and non-optimal situations. Such normative considerations involve our normative judgments. But it would violate the naturalistic constraint to introduce other intentional mental states (normative judgments) to explain content. So these theories which define optimal situations are problematic because their criterion for content-fixing situations is arbitrary and threatens to violate the naturalistic

constraint.

Dretske tries to avoid these problems. He differentiates the content-fixing causes and the other possible causes of a mental state by a distinction between a *learning phase* and a *post-learning phase* (Dretske 1981). In the learning phase, all the causes of a certain mental state are content-fixing. A mental state (or a concept) has as content the objects which cause that mental state in the learning phase. If my concept "fox" is caused only by foxes in the learning phase than "fox" represents foxes.

Furthermore, Dretske conceives this causal relation as a counterfactual supporting relation. Dretske´s conception of mental representation is based on the notion of *information*. "Fox" represents foxes if the mental state corresponding to "fox" carries information about foxes. Or, he has a strong notion of information where the effect (the mental state "fox") carries information about the cause (foxes), only if the conditional probability that there is this cause given the effect is 1 (see Dretske 1981: 65). So, given the tokening of the mental state corresponding to "fox", the probability that there is a fox must be 1, in order for the concept to carry information about foxes. Foxes could sometimes have other effects than that mental state, but given the mental state, there must be foxes as its cause. Information about foxes in a mental state requires the following counterfactual to be true: If there were no fox, there would not be any tokening of the mental state corresponding to "fox".

Fodor (1984a) emphasized several problems with this conception. First, it is unclear *when the learning phase stops* and when the post-learning phase begins i.e. the phase where causes are not content-fixing. In the learning phase, a dog causing a "fox" tokening would change the meaning of the concept into "fox-or-dog". Indeed both causes, foxes and dogs, would be content-fixing. But if dogs cause the concept "fox" only in the post-learning phase, then "fox" only represents foxes and is falsely applied to dogs in the post-learning phase. But how can we distinguish the two phases? The theory requires a clear-cut distinction between the phases, but there is no clear criterion to tell when one phase stops and the other begins.

More important is another of Fodor´s objections concerning *counterfactuals*. The distinction between learning and post-learning phase was introduced to avoid the disjunction problem. But the causal relation between a mental state´s cause (foxes) and this state (the concept "fox") must be counterfactual supporting, at least in the learning phase, given Dretske´s strong notion of information discussed above. After the learning phase, the mental state can be caused by something else (e.g. dogs). This possibility is required in order to permit error and misrepresentation. But if in the post-learning phase, dogs can cause the tokening of the concept "fox", it is arbitrary to suppose that this couldn´t also happen in the

learning phase. Although, actually, only foxes cause the tokening of the concept "fox" in the learning phase, the counterfactual that dogs would cause the concept "fox" is also true for the learning phase. As the content-fixing causal relation is a counterfactual supporting relation, it is true already for the learning phase that foxes or dogs would cause the tokening of the concept "fox". Given that the content-fixing causal relation is counterfactual supporting, the concept "fox" represents the content fox-or-dog. The disjunction problem reappears despite the distinction between learning and post-learning phase.

Given these problems for the explanation of type-one situations by a learning phase, the content-fixing situation has to be explained in some other way. In the learning phase, a teacher can arrange the learning situation in such a way that only foxes cause the tokening of "fox", but that does not avoid the problem posed by counterfactuals. We can appeal to teacher´s intentions by saying that the teacher meant "fox" to represent foxes and not dogs. But in this case we would violate the naturalistic constraint to explain intentional states without the appeal to other intentional states, in this case teacher´s intentions.

It seems that content-fixing situations cannot be defined only by a causal relation without introducing other intentional notions or some normative constraints. Intentional notions violate the naturalistic constraint. Normative constraints able to distinguish the content-fixing situation need to be defended independently of the causal relation.

There are several possible answers to such objections to a causal theory of content. First, even if we introduce further intentional notions to explain content, as it was the case with the introduction of teacher's intentions, we can still hope for a naturalistic explanation of these further intentions. Papineau adopts such a view when he states, that we can explain mental representation only if at least a psychology of desire is already given in the organism having these representations (Papineau 1993). But he intends furthermore to give a naturalistic explanation of these intentional states, desires.[61] So, even the introduction of intentional notions does not condemn a naturalistic explanation.

Secondly, an epistemological argument could save the seeming impossibility to distinguish on a causal level between content-fixing and wild causes, between situations of type one and the other situations. It may be that there is such a difference, but that we are unable to know it or detect it. We may just not have epistemic access to that difference although there is one.

Thirdly, it can be argued that the constraints adopted for a reduction of content to

[61] Papineau (1993) defends a teleosemantic view of mental content and not a causal theory, but his strategy to introduce intentions which can be explained naturalistically could equally be adopted in a causal theory of content.

causal relations are too strong. It may be that in philosophy we almost never fulfill the constraint to give necessary and sufficient conditions for the reduction of one concept to another. It may be that the reduction of content to causal relations alone fails just because of such demanding constraints on reduction.

But the most widely followed way to save a reductive explanation of content is to explain content by causal relations *and* something else; and in many naturalistic theories that something else are functions. Mostly, causal theories try to get that normative constraint from the normativity of biological or developmental functions. I will come back to that option in the section on teleological theories of content. But before that, we have to consider another problem for causal theories, the problem of indeterminacy.

2.3 The Problem of Indeterminacy

A general problem for the causal theories is the so-called *problem of indeterminacy*. One version of the indeterminacy problem arises from the fact that causes are part of a long causal chain. Given such a chain, it remains indeterminate which property in that chain is singled out as *the* cause of the mental state and therefore as *the* content of that mental state. In visual perception, light reflects first upon the surface of an object. That reflection causes light-waves of a certain length, distributed in a certain way in our environment. These light waves cause an activation of nerve-cells (cones and rods) in the retina. The activation of these cells causes further activations in the optic nerve, then in the lateral geniculate nucleus (LGN, an area beneath the cortex) and then in the visual cortex. If we locate the visual state somewhere in the visual system of the brain, then we have to ask which property in that long causal chain leading from the light and the surface of the object to the brain state is actually represented by the brain state. A series of properties is part of the causal chain, reflectance properties of the distal object, properties of light-wave, activation properties of the retina, chemical properties in the cones and rods of the retina and the electric action potentials of diverse brain cells. Which of these properties enters the content of perception on the causal theory of content?

A theory like the “Best Test Theory” cannot answer this question. If we find a property which causes most frequently a certain perceptual state, then all the intermediary steps from that property to the brain also cause the perceptual state.

Fodor gives a response to the indeterminacy problem arising from causal chains (Fodor 1990: 117 f.). He introduces a further criterion for semantic content besides the asymmetrically independent causal relation, namely *“robustness“*. A semantic relation must

be robust, that is, a state S can only mean property P, if S is normally caused by Ps, but can be caused by something else than Ps. If only Ps can cause S, then the P-S relation is not robust and cannot be a semantic relation. Alternative causes of S guarantee the "robustness" necessary for a semantic relation. But if we suppose that we can have the same perceptual experience through a causal chain from the object to the brain or through hallucination i.e. though a perceptual state caused only by an internal process of the brain, then most of the relations between the brain state and the properties in the causal chain are robust. Therefore, even with the supplementary criterion of robustness, the intermediary steps in the causal chain could all be part of the content. If that is the case, robustness is not an answer against the threat of indeterminacy due to causal chains.

The indeterminacy problem I discussed here is only one version of a more general problem about the indeterminacy of content which arises in causal theories of reference from the so called *qua-problem* (Devitt 1981). If the cause of a mental state determines its content, to what does the mental state refer to in that cause. As mentioned, there is first the problem of the causal chain. Secondly there is the problem of the representation of aspects or whole objects. If one object is singled out in that causal chain, does the mental token represent an aspect of it or the whole object. Thirdly, which properties of the object does the mental token represent? Does it represent only the most determinate properties like the specific shade or shape of the object or more determinable properties, for example the property to be blue or colored, or the property to be a fox? [62] For perceptual content, the second problem of the representation of aspects or the whole object is the less problematic one as it is generally accepted that perception only represents some aspects of an object and not the whole. But besides the problem of causal chains, a theory of perceptual content has to address the problem of the representation of determinate or more determinable properties.

Causal theories of content have either a problem to solve the disjunction problem or the indeterminacy problem. And it seems that these problems cannot be solved by an appeal to causal content-fixing conditions alone. Even if it is possible in a causal theory of content to define some normal or optimal conditions which are able to specify the content determining causal relations, the problem of indeterminacy requires a further criterion to determine which property is represented in the content-determining causal chain. Teleosemantic approaches to content were developed to solve not only the problem to distinguish the normal causes from

[62] I mean here that a property is determinable when there are still more determinate properties falling under the determinable property. Usually, the difference between determinates and determinable is only relative. A determinate property ("turquoise") is determinate relative to a less determinate property ("blue"), but is itself a determinable to a more precise determinate property (a specific shade of turquoise, e.g. "celeste").

wild causes, but also to answer the indeterminacy problem.

It is especially the difficulty to say which event in a causal chain is actually represented that constrains to look for an explanation which goes beyond just the causal relations of a mental state. Why do many naturalistic theories of intentionality then introduce functions? First, functions are not themselves intentional notions and do therefore not threaten to violate the naturalistic constraint. Secondly, functions can themselves be explained by the causal and historical relations an organism has to its environment. They can be explained by notions which are perfectly acceptable for the natural sciences. If a causal theory is complemented by intentional notions (beliefs, desires), as it was the case with teacher's intentions or desires, then a naturalistic explanation of content is just shifted one level higher. We have to give a further explanation of the introduced intentional notions. If content is explained by consciousness and phenomenal states or if it is explained by prescriptive normativity, the further problem of a naturalistic explanation of norms or of conscious or phenomenal states is introduced. And a naturalistic explanation of these notions seems much more problematic or on some accounts even impossible. So, if a purely causal theory is insufficient for an explanation of representational content, as I argued before, the introduction of biological or developmental functions seem to be the best candidates available for the program of a naturalistic explanation of intentionality and content.

3. Teleosemantic Theories of Content

3.1. Functions

The teleosemantic approach to perceptual content gives a better answer to the indeterminacy problem. Teleosemantics combines the causal theory of mental content with an account of the function and purpose of mental states. The function can be either the biological function of certain physiological systems, for example the function of the sensory systems, or it can be an ontogenetically acquired function which developed through the adaptation of an individual to certain circumstances. Dretske (1988) defends ontogenetically acquired functions especially for the mental content of propositional attitudes, but emphasized in the case of perception the role of phylogenetically developed biological functions (Dretske 1995: 15). The function of perceptual systems is mainly hard-wired and does not change with the circumstances and the context in which an individual develops. In perception, biological functions play certainly a bigger role than for the content of concepts. Besides this difference between the acquired and innate functions, the teleosemantic theories can be distinguished into those which derive the

function from the producer system of perceptual states (Dretske 1986, 1988 and 1995, Matthen 1988, Neander 2006) and those which derive the function from the consumer systems of a perceptual state (Papineau 1984 and 1993 and Millikan 1984 and 1989).

Why introduce *functions*? They are supposed to explain the normalcy condition and can therefore differentiate the content-fixing causes from other wild causes. Furthermore, they can solve the indeterminacy problem. I will follow here the etiological view of functions (Millikan 1984 and Neander 1991) and define a function as a *selected effect*. The function of a system, for example a physiological system, is the effect which the system was selected for. In the case of the heart, that organ produces diverse effects; it contracts, makes a regular noise and pumps blood. On the etiological view of functions, the function of the heart is that specific effect it was selected for, that effect which explains why it was selected. The heart was selected because it pumps blood, not because it makes noises. That is the effect which explains why the heart continues to exist in living beings. Had the heart only made regular noises without pumping blood, it would not have been selected. The noise has no biological function and is only a side effect of contraction. Such a view of function needs not to be limited to biological systems. Behaviors or mental states can be "selected" in an individual´s development because they have an advantageous effect. They are "chosen" or "selected" because of this effect.[63]

Now, the teleological theories of mental content apply that view of function to mental states, or more precisely either to the systems which produce (producer systems) or to the systems which use mental states (consumer systems). A token state cannot directly have a function, because functions depend on a history of selection. But the system which produces or uses a mental state can have a history of selection and a function. We can and generally do attribute functions to the perceptual system which produces a specific perceptual state (token). We can also attribute functions to the system which uses perceptual states, for example our motor system which uses perceptual state for orientation and locomotion or the reasoning system which uses the information of perceptual states. In both cases, i.e. the attribution of function to producer systems or to consumer systems, the token perceptual state can derive its function from the function of the system. Let us take again the example of the heart, it has the function to pump blood because of its evolutionary history of selection. A single contraction of the heart derives its function from the function of the organ. We can attribute to that token state, that contraction, the function to pump blood and say that it is malfunctioning, if it fails

[63] „Selection" is not meant here in the biological sense of natural selection. A behavior or mental state can be „selected" in an individual by a method of trial-and-error. It is neither selected in the biological sense nor is it chosen through an intentional decision of the individual.

to pump blood. In the same way, we can say that a perceptual state has the function to represent features of the environment, if the perceptual system was selected to do so.

I will discuss in the next sections, how the content of mental states can be derived from the function of the producer system of the state or from the consumer system which uses the mental state.

3.2. Functions of producer systems

For Dretske (1988 and 1995) perceptual systems have *indicator functions*. They have the function to indicate certain properties to the organism which uses that information in diverse ways, for example for the guidance of action. Dretske takes the example of a very simple perceptual system, the magnetosomes in marine bacteria (Dretske 1986). Magnetosomes are sensory mechanisms which detect gradients of the magnetic field in the environment of the bacteria. They are used by that organism to orient its movement in the direction of the magnetic pole. The bacteria orient their movements towards the pole and that means in the direction of deeper waters, the region with a low level of oxygen, the only condition where that microorganism can survive. That primitive sensory mechanism was selected, because it indicates the direction of magnetic north, a direction which correlates with favorable conditions of survival.

Content derives from indicator functions of the perceptual state. It is the function of that sensory system to indicate the direction of magnetic north. Such an attribution of functions to sensory systems can be used as the content-fixing property. A perceptual state has that property as content which it has the function to indicate. On that view, not all the causes are content-determining, but only those causes which the sensory system (and therefore the states it produces) has the function to detect. Content derives from the indicator function of the state. The functions of a state are therefore content-fixing and can resolve the problem of disjunctive contents. A perceptual state has the function to indicate a certain property in the environment. If that state fails to do so, if it is not actually caused by that property, it fails to indicate that property although it is its function to do so. If a state has the function to indicate foxes, but is caused by a dog, it still has its function to indicate foxes but fails to do so. Its content is “fox” and it misrepresents its cause as “fox“.

Dretske´s theory combines an informational semantics of indicators with the teleological notion of function. In that sense his version of teleosemantics represents a hybrid theory. Only states which stand in a regular causal relation to some specific cause, which are

indicators or natural signs of this cause, can acquire an indicator function, the function to indicate that cause. So, there must first be a causal relation between an external feature *C* (the cause), and a mental state *E* (the effect). The mental state *E* indicates *C*, when it carries information about *C*. In order to do that, there must be a regular relation between *C* and *E* in the domain were *E* is selected. In that domain, all *E*s are caused by the environmental feature *C*. Once *E* acquired its indicator function, *E* can be caused by other features of the environment. If *E* is caused for example by some feature *D*, it would misrepresent that feature. So, besides the causal relation between the mental state *E* and its cause *C*, there must be an explanation about the teleological component of the theory: How does the mental state (*E*) acquire its function?

There are two ways a mental state can acquire a function in Dretske´s theory. A mental state can acquire an *evolutionary function* through natural selection or a *developmental function* through a learning process (Dretske 1988: chap. 4). A system producing mental state E can be selected to cause certain movements or activities of the organism, because these movements caused by indicators of feature *C* are more beneficial. Dretske gives the example of the noctuid moth´s auditory system which has been selected to guide its movements. Such movements guided by sounds permit the moth to avoid the sound of its predator (the bat) (Dretske 1988: 91). The auditory system was selected to play a function in the guidance of the bat´s movements. And it was selected because it is an indicator of external features (bats). It was selected because the system produces bat-indicators. It is the function of the system to produce bat-indicators and of its perceptual states to be bat-indicators.

Developmental functions are explained by a process of learning. A mental state (*E*) which is an indicator of a certain feature (*C*) is recruited as a cause of a certain movement or activity (*M*). Dretske explains this by a system of reward and reinforcement. If the movement *M* is more beneficial, when it is caused by the mental state *E*, then the reward for *M* reinforces the causal relation between the mental state (*E*) and the movement (*M*). The mental state is recruited as a cause of *M*, *because* it is an indicator of certain external conditions (*C*). *E* acquires therefore the function to indicate these external conditions (Dretske 1988: 95 ff.). Fig. 1 gives a schematic representation of the causal relations involved.

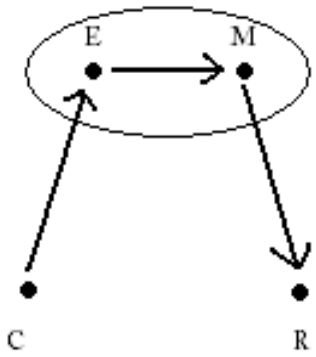


Fig. 1: Schematic Representation of the causal relations in Dretske´s theory.

On the *evolutionary explanation* of function, *E*, a *C*-indicator, is selected for its advantageous effect on *M*. Movements caused by *E* are beneficial and advantageous for the system, therefore *E* gets a function in the system, due to the fact that it is an indicator of *C* (*E*s which are not caused by *C* would not be thus selected). On the *developmental account* of function, *E* gets its function, because *E*-caused movements *M* have a rewarding effect (*R*). The reward reinforces the connection between *E* and *M*. *E* gets recruited as a cause of *M* through the repeated rewards to *E*-caused movements *M*. Through these processes of selection or recruitment, the mental state *E* gets the function to indicate external condition *C*. Would it not indicate *C*, it would not be selected. Therefore, it is the fact that the mental *E* is an indicator of *C* which explains why the mental state is selected and gets its function. Being mostly an indicator of C, M gets the function to indicate C. And from that indicator function derives the content of the mental state. Due to its function *E* is a representation of property *C*.

If we apply that explanation to the often discussed example of the content of a *frog´s mental content*, we get the following picture: An internal perceptual state of the frog is caused by flies and is therefore a fly indicator. The fly indicator (*E*) gets selected because of its positive effect on the frog´s behavior (*M*). Snapping behavior is more successful, if it is caused by fly-indicators than by other mental states. Through this process of selection the mental state *E* gets a function in the system, it gets the function to indicate flies. Even if, once, *E* is not caused by a fly, it keeps its indicator-function which determines content. It keeps its content “fly” and misrepresents the wild cause as a fly.

This attribution of content through indicator functions solves the disjunction problem. E does represent flies, not flies-or-wild causes (beebees). It is less clear if it can solve the different indeterminacy problems, especially the causal chain problem. Does the frog represent flies or fly-patterns in the ambient light? Neander (2004), for example, denies that it

solves *that* indeterminacy problem. If E was selected, because it indicates flies, it was also selected because it indicates all the intermediary causal chains. Therefore it has also the indicator-function to indicate fly-patterns and retinal fly-images.

But it is more plausible that the attribution of indicator functions can resolve the indeterminacy problem which arose from causal chains. What selective advantage would it have for an organism to represent the properties of its retina? To monitor the well-functioning of these physiological processes? That does not seem to be a very plausible explanation. And therefore, it is not plausible to ascribe to the visual system the function to monitor the retinal processes. On the other hand, the detection of surface properties of objects, for example reflectance properties, seems to be a very useful information in the selection of food or the detection of predators. It is a much more plausible ascription of function to say that the visual system has the function to detect surface properties of distal objects than that it has the function to monitor the retina. Given that plausible ascription of function, we can say that visual perception represents the surface property of objects and not some or all other properties in the causal chain. The teleosemantic ascription of function is therefore a plausible solution to the indeterminacy problem.

Does this teleosemantic theory resolve the problem of indeterminacy, the problem whether determinable or more determinate properties are represented? Does the frog represent flies or frog food (the determinable/determinate problem)? I will come back to that question in the next section.

But the *attribution of indicator function* to mental states is problematic for another reason. Teleological theories of content accept generally the etiological view of function. But on that view the function of a state is attributed by looking at its effect. For example, the function of the heart is its effect on blood flow and it is selected for that effect. When a mental state has an indicator function, it has the function to indicate its cause. Papineau (1993) and Millikan (1989) emphasize that it is strange on an etiological view of function to ascribe to a trait the function to be caused by something. The function of a trait must be one of its effects not its cause.

Mental states get their indicator function, because they have an effect on other mental states or bodily movements. They cause other activities or movements and have this effect, because they are indicators. They can play their role relative to these activities, because they are indicators. But then the indicator function only derives from the effects of that mental state. The mental state (*E*) has an effect on other activities (*M*) and that is its function. It can only satisfy that function if it is an indicator of *C* and it is selected for that function, because it

is an indicator of *C*. But that means that *E*'s function is different from its indicator function. The function is an effect on *M*. The causal relation between a mental state and its cause only play a role in that state's function. Dretske´s attribution of function does not say what the mental state's function is, i.e. what its effect is for which that state was selected. He only emphasizes that the mental state gets that function because it is an indicator and gets therefore an indicator function besides its "real" function. What is missing in Dretske's approach is an analysis of the mental state's effect and therefore an analysis of that state's function. It is arbitrary to derive an indicator function from a mental state's function without making explicit what that state's function actually is. Teleological theories of function which focus on the consumer system of a mental state more explicitly try to attribute functions by looking at a mental state's effect. Let us look next at these versions of teleosemantics.

3.3. Functions of consumer systems

In opposition to the input oriented teleosemantics which derive content from the causal relation of a state, Millikan (1984, 1989 and 2004) and Papineau (1984 and 1993) developed an *output-oriented* or *benefit based view* of the function and content of mental states. For them, the content of a mental state derives from that state's function, independently of the fact whether that state carries information about its cause. The content derives from the effect that state has on a consumer system, i.e. a system which uses that mental state. While Dretske's input-based account does not look at a mental state's effect to determine its content, this output-oriented account does not look at the cause of the state to attribute content. I will defend here the view that the later option leads to serious problems in the determination of content. But let us briefly state the theory.

On the teleological view based on *consumer systems*, the content of a mental state derives from the function of the system which uses that mental state. If a mental state is used to orient toward food, then that state is used by the foraging system, for example. To attribute content, we have to look at the function of that foraging system, the function of that mental state's consumer system. Millikan and Papineau follow the etiological view of functions defined as selected effects (Millikan calls them "proper functions"). The function of that consumer system is to get food. That system was selected because it provided food to the organism. The mental state is used by that system, because it contributes to satisfy that system's function. In Millikan's theory, it does so by representing the normal condition of the proper functioning of that system.

There are two elements which explain the representational properties of a mental state, *two conditions for being a representation*. First, the mental state must correlate with the normal conditions for the proper functioning of the consumer system. And secondly, it must be used by the consumer system to fulfill its function. Let us say, a mental state regularly correlates with the presence of frog food (it is for example a perceptual state correlating with flies). The presence of frog food is a normal condition for a well-functioning foraging system. That system functions normally only if there is frog food nearby. The mental state's representational property derives from the fact that it is used by the consumer system to satisfy its function. The system satisfies its function (getting food) by using a state which correlates with food. Thereby that state comes to *represent* the conditions (presence of food) which are necessary to fulfill the function. The state has as content the presence of food, i.e. the normal condition of functioning of the consumer system.

To make explicit the *causal relations* involved in that attribution of content, let us get back to the schematic representation of these causal relations in Fig. 1. The consumer system is represented by *M*, a system which was selected for some of its effects, namely the effect R (to be selected, it is sufficient that *M sometimes* has that effect). So the consumer system's function is to do R (e.g. get food). The system *M* does get food (*R*) only under certain condition, namely when there is food nearby. Similarly the heart does only pump blood, its function, when there is blood in the veins.[64] These are the normal conditions necessary for the satisfaction of the function. These normal conditions, some external conditions in the environment of the organism, are represented in our figure by *C*. So *M* does actually *R*, only if this condition *C* obtains. Otherwise it fails to satisfy the function (it does *T* instead of the beneficial effect *R*). Now, we can see how the two conditions for representation can be met. If some state in the organism, *E*, correlates with this condition *C* and if *E* is used as a sign by the system, then *E represents* that condition *C*. It is easy to see the benefit for the system *M* in using *E*. If *E* correlates with *C* and causes the activation of *M*, then *M* will work under the conditions which are necessary for the desired effect *R*. The consumer system *M* avoids activation when the conditions for success (condition *C*) are not met. It avoids activation in situations where it fails to do *R*.

To summarize the theory: from the observation of the causal history of *M*, we can see for which effect (*R*, not *T*) the system *M* was selected. *R* is the function of the system and

[64] Obviously, the heart differs from a system which has representations. The heart has a *function* (pumping) and there are *conditions* (presence of blood) in which it functions properly. But no state in the heart does *represent* these conditions. Given that there is always blood, it does not even need, in order to function well, to represent that blood is coming. Contrary to the heart, an organism which lives in constantly changing conditions has an obvious advantage to represent those conditions in which his functions can be satisfied.

from its function we get the normal conditions of proper functioning *C*. From all mental states which co-vary with *C* and which are used by the consumer system, we get the mental states which are representations. And from the states they correlate with plus the normal conditions of M we get the content of these representations. The theory only uses causes and effects of physical states and correlations between them to determine intentional content.

The relation between a cause *C* and a mental state *E* is not sufficient for representation. Correlations between types of events are ubiquitous in nature. If they were enough for representation, everything would be a representation. So, function is a further necessary condition. But on the consumer-based theory, neither a causal relation nor an informational relation between *C* and the mental state *E* is necessary. Correlation is sufficient, if the correlating mental state is used by some consumer system. If a mental state co-varies per pure chance with the normal conditions for the consumer system, that is enough. While the producer-based teleological theories do not consider sufficiently the effects of a mental state, the consumer-based theories reject the causal and informational relation of the mental state as a necessary condition for content. We will see that this poses a problem especially for perceptual content. But before, let us look at some other objections to teleological theories and more specifically to the consumer-based theory.

3.4. Objections

First, I will defend the teleosemantic views in general against some objections, the normativity objection (1) and the swampman objection (2), before addressing some special objections to the consumer-based view (3 and 4).

(1) *Normativity*: Sometimes it is claimed that linguistic meaning is essentially a normative phenomenon (Kripke 1982) and also that intentional content is such a normative phenomenon (Boghossian 2003, Wedgewood 2009, for an overview see Glüer/Wikforss 2009). If intentional content presupposes norms and if norms cannot be explained in a naturalistic way, then the claim of the normatively of intentionality becomes a refutation of naturalistic explanations of intentional content.

First, *Boghossian´s normativity claim* for meaning (Boghossian 1989) does not apply for perceptual content. Boghossian´s "simple argument" derives normativity from correctness conditions for states with meaning. It is generally agreed that propositional attitudes have correctness conditions. On the intentional view of perception, perceptual states have also correctness (or accuracy) conditions. Boghossian claims that from meaning, we can derive a

prescription that we ought or should apply that term in a certain way. If "green" means green, then it is correct to apply that concept to green things. From that is derived the prescription that we ought or should apply "green" to the conditions of its correctness. But for perceptual states, the correctness conditions cannot imply any prescription. Prescriptions are generally formulated in deontic terms like "ought" and "should". But "ought" and "should" imply "can". One cannot prescribe that we should avoid perceptual illusions, if we cannot avoid them. As perception is not a voluntary tokening of mental states, we cannot be prescribed to token them in a certain way.

We saw for some causal theories that they made appeal to *normalcy conditions* to explain mental content. Content-fixing causes defined as causes under epistemically optimal conditions presuppose norms which define what "optimal" conditions are. We saw that Dretske's content-fixing causes in a learning phase may involve some norms of the teacher, who tries to assure a correlation between the "right" causes and concepts. But I claimed that the involvement of such norms was an objection to these theories, because they failed to meet the naturalistic constraint. It was the claim of the teleological theories of content, to give a naturalistic explanation of the distinction between content-fixing situations and other situations. In that sense they try to give a naturalistic explanation of "normal" situation of content-fixing causes. Do the teleological theories of content, the theories discussed in this section (§3), also presuppose norms?

We derive *normative claims from functions*. Given that the heart's function is to pump blood, we say that it "should" pump blood. But by saying that, we do not prescribe the heart anything. The normativity we derive from functions is no *prescriptive* normativity. In the same way, when we say that we "failed" to see something and that it is "incorrect" or "inaccurate" to see that property, we derive normative claims from the content of perception. But here again, these normative claims are no prescriptions. Those defending the etiological view of function admit the normativity of function, but that normativity is descriptive and not prescriptive (Neander 2004[65]). Functional norms are like statistical norms; they do not prescribe something, but just describe certain regularities. The heart's function is to pump and the perceptual system's function is to be accurate because that enhances survival. But these functions just describe that individuals whose perceptual systems and hearts do that are more likely to survive. Nothing prescribes them to survive, even if most creatures want to survive.

The claim that intentional content is normative generally presupposes prescriptive normativity (see Glüer/Wikforss 2009). Or teleological theories and functions only involve

[65] See also Neander´s unpublished paper "The Narrow and the Normative", a paper for the NYU series on Mental Causation, available at http://philpapers.org/rec/NEATNA

descriptive normatively. Their ascription of meaning does not involve any normativity in the strong prescriptive sense. From that descriptive normativity of functions there is no threat to a naturalistic explanation of content.

(2) *Swampman*: On the producer-based and the consumer-based teleological theory of content, the attribution of content depends on functions selected in natural evolution, although developmental functions are not excluded. Generally, it is conceived in these theories that the content of perceptual representations is fixed by evolutionary functions (see Dretske 1995: 15; for Millikan the proper functions determining content are biological functions). But if content depends on functions selected in the evolutionary history of a species of which the individual organism is a member, then individuals without evolutionary history would have no content.

The scenario of *swampman* exploits this consequence that, without an evolutionary history, there are no biological functions and without function no content. Davidson (1987) invented the example of a creature which by sheer accident formed next to him (in a thunderstorm in a swamp). The creature formed by chance as a molecular duplicate of Davidson and replaced him. Swampman goes home like Davidson would have done and continues his live. Swampman has no evolutionary history. He is the product of a storm. Neither is he a copy of a creature with an evolutionary history (the storm did not copy Davidson but caused swampman by pure chance). It has no functions, although he behaves like Davidson. Given that mental content depends on biological functions and history, swampman would have no mental content. He represents nothing and his mental states and his perceptions are about nothing. But given that swampman is a molecular duplicate of Davidson, it behaves like a normal human being.

The swampman scenario challenges the idea that content depends on causal or selectional history. It seems intuitively implausible that swampman has no mental content. But if it is implausible, content cannot depend on history and the teleological theory of content would be false. Neander (2004) weakens these strong intuitions against the teleological account. She emphasizes that swampman can have narrow content, the content which depends only on the physical constitution of the individual and not on its causal and historical relations to the environment. If we suppose furthermore that phenomenal states supervene on the individual's (narrow) physical constitution, then swampman can also have phenomenal states. So, swampman's mental states need not to be completely different from ours. They can be phenomenal and can have narrow content. That makes it perhaps less implausible that swampman behaves like us. Still he lacks an essential aspect: wide content.

Swampman represents indubitably a problem for teleological theories and there is no

convincing defense against that example from defenders of teleosemantic views of content (see Papineau 2001, Neander 2004). The only strategy until now is to make the intuitions triggered by swampman against historical theories of content less strong; or to question more generally the force of intuitions triggered by counterfactual scenarios.

(3) *Indeterminacy of Function*: Functions were introduced to eliminate the indeterminacy of mental content. As I discussed the different qua-problems, we saw that causes do not determine content in a precise way. The hope is that functions permit to reduce that indeterminacy. But if functions are themselves indeterminate and content derives from them, then the determination of content stays indeterminate. There are two arguments which state that functions are too indeterminate for a precise ascription of content.

The first argument says that mental content has *intensionality*, but functions are extensionally defined notions. Therefore they are not fine-grained enough to explain intensional notions (Rosenberg 1989, Fodor 1990). Mental states, for example beliefs, can differ in meaning although they refer to the same entities or extension. They have intensionality. Biological functions are explained by (past) causal relations and causality is extensional. We have the same causal relation, if we substitute expressions with the same extension to describe the relata of the causal relation. It is claimed that function cannot explain the fine-grained intensional differences of content. This argument has no force against perceptual content, because it can be doubted that this content has intensionality.[66]

The second argument comes from the fact of *chains of functions* (Neander 1995, Papineau 1998). That argument is problematic especially for the consumer-based theory of content. We saw already about the causal theories of content that it remains indeterminate which events in a causal chain of a mental state are actually the content of that state. A similar threat arises with functions. Biological functions are interconnected. A certain foraging behavior has the function to get food. Getting food has the function to satisfy the digestive system. That system has the function to give the body the necessary energy. And these cooperating systems of the organism have all the function to increase the chances of survival and reproduction. With different functions, we get different ascriptions of content. Which of these functions should actually be used to determine the content of the perceptual state used in getting food? If the most general function is used, then the perceptual state represents the normal conditions which guarantee survival. That is too general to attribute any determinate content to that state. The problem of the chain of functions can be blocked, if we determine the most immediate function of the consumer system. Neander (1995) proposed that we

[66] See Chap. 5 for arguments against the intensionality of perceptual content.

determine the immediate function by looking at the effects of the system which would be absent, if the system were malfunctioning. The foraging system may fail to provide energy or increase the chances of survival, because the digestive system is not working. Food gets into the system, but is not used in the appropriate way. But these effects (no energy, no increased survival) cannot be attributed to the foraging system and therefore cannot be its function. The foraging system would be malfunctioning, if it does not get food. Therefore, its immediate function is getting food, not producing energy or increasing survival. A mental state used by the foraging system represents the conditions which satisfy that function, namely food.

Another solution for the problem of chains of functions is provided by Papineau (1998 and 2003). He limit's the ascription of content to systems which have desires. The content of a state used to satisfy a desire is given by the conditions which satisfy a desire. We get the content once we determine the given desire. The threat of chains of functions is avoided. The problem of that solution is its use of another intentional notion, desire, to determine content.[67]

(4) *Pietroski´s Objection*: The most serious problem for the consumer-based theory is the fact that it divorces the attribution of content to a mental state from the cause of that state. Such a divorce is particularly counter-intuitive in the case of perception. We generally think that the perception of an object is caused by that object. It is also intuitively plausible that the content of perception is related to the object which causes the perception. Or on the consumer-based theory, that needs not to be the case. Pietroski invented a fictive scenario which shows particularly how counter-intuitive a divorce of content from cause can be. Pietroski (1992) invents a selectional story for a type of perceptual state which is totally divorced from the cause of that state. He imagines a color-blind animal (the "kimu") which is often eaten by its enemy (the "snorf"). The kimu live in plains where also its enemy lives. At a certain moment, one new-born kimu has the capacity to see red and a desire to see red objects. In its environment only the morning or evening sun is red. The new capacity and desire drives the kimu to watch sunrises and sunsets in the hills where no snorfs live. As snorfs hunt in the morning and evening he generally avoids them. Through this selectional advantage, the capacity to see red spreads through the kimu population. The capacity to see red is selected because it makes kimu *avoid its enemy*. That is the selected effect, and therefore the function, of the capacity. Normal conditions for the proper functioning of that capacity are snorf-free space. Given this selectional history, the content of red percepts is "snorf free space". The content has nothing to do with the cause of the state, red objects. And the content is "snorf free space" although it may be that a kimu never actually saw any snorf, given that kimu now

[67] See p. 115 on that problem.

live in hills when their enemy hunts in the valley.

That somewhat bizarre biological scenario shows that the function of a mental state can be completely divorced from its cause. If we accept the consumer-based theory of content, content of a state can be completely independent of its cause. Especially for perception, that consequence is highly counter-intuitive. Neander (2006) emphasizes a further disadvantage of that divorce of content of a state from the cause of that mental state. Cognitive science generally explains perceptual states by their causal and informational relation. Ignoring these relations in a theory of perceptual content would divorce such a theory from the usual explanations of perception given by cognitive science.

Given the disadvantage of a divorce of content from cause, especially for a theory of perceptual content, and given the problem of indeterminacy for a purely causal theory of content, I will defend in the next section a hybrid theory. Such a theory combines the cause of a perceptual state and its function to attribute content. Versions of such hybrid theories have been presented by Dretske (1988 and 1995) and Neander (2006).

4. A Hybrid Theory

In the previous sections, I emphasized some short-comings of the existing naturalistic semantics. For the causal theories, I emphasized the fact that a restriction to causal relations alone will not resolve the disjunction problem and therefore distinguish the content-fixing causes from other causes. For the theories ascribing indicator functions to mental, and perceptual, states, I emphasized that indication is a relation to a cause, but function is a relation to effects. And it is not clear how the function to indicate a cause can emerge from the effects of a mental state. For the theories which derive content from the function of consumer systems, I emphasized that they ignored in the ascription of content to a mental state the cause of that mental state and the information that state carries.

I will propose here a *hybrid theory* which combines elements of the causal and informational theories of content and elements of the semantics based on the function of consumer systems. I think, against consumer based teleosemantics that we have to look at the cause of a perceptual state to determine its content. It is not enough to look at the conditions of proper functioning of the consumer systems to tell what the content of a perceptual state is. Against indicator semantics, I think that the best explanation why a perceptual state acquires the status of a representation is to look at the effect of that perceptual state on other systems and at the function of these systems.

For an explanation of perceptual representation, we have to distinguish two aspects, first the *content* a perceptual state has. Here we have to look at the cause of that state. Secondly, we have to look at the way a perceptual state acquires its *representational status*. What makes a causal relation between a certain property and a mental state into a representation? What gives the perceptual state that representational status? In the explanation of the representational status, I will follow the consumer-based teleosemantics by looking at the effect a perceptual state has. So, I will differentiate here between an explanation of the representational status of a perceptual state and an explanation of the content of a perceptual state. Let us look first at the explanation of representational status.

(1) *Representational Status*: The explanation of the way a mental or perceptual state acquires a representational status will depend on the function a perceptual state acquires and especially the function to indicate certain properties (Dretske 1988, Neander 2004 and 2006). But how does a state get such a function? We can claim, like Dretske and Neander, that perceptual representations have an indicator function, but through which process does a state acquire that function and therefore the status of a representation?

Following the etiological theory of functions, any type of states or any system gets a function, if one of its effects is selected. The selected effect will be the function of this type of states or of the system. What can be the selected effect of a perceptual state or more generally the effect of a perceptual system? A perceptual state will get a function, if it has an effect which is advantageous to the organism. Let us look again at the example of the perceptual system of the frog. Frogs try to catch preys (frog food) and try to avoid predators (Neander 2006). The behavioral system dedicated to catching prey (moving and orienting toward the prey, snapping at the prey) will succeed only, if there is some frog food in its vicinity. There is no point in snapping at something which is no frog food. A condition of the success of the behavioral system dedicated to catching preys is that there actually is some frog food around and no fake frog food. If there is no frog food or fake frog food, the prey catching system will fail. It will not fulfill its function. Millikan called the conditions of success of a function the condition of proper functioning of that system (Millikan 1989). We may more generally call them the *success conditions* of a function. A system will fulfill its function, if these success conditions obtain and fail otherwise.

A perceptual state which indicates the conditions of proper functioning of a system, or, in my terminology, its success conditions, will be of a great advantage for that system. In the case of the frog's snapping behavior, that behavioral system will highly increase its success if it snaps only when the success conditions for snapping behavior obtain, i.e. when there

actually is frog food. A behavioral system dedicated to catch preys will have a great selective advantage, if it is connected to a perceptual system indicating the success conditions of that behavioral system.

The relation of a perceptual system or a state of that system to the success conditions of other activities of the organism can explain why perceptual states get a function. If a certain activity (e.g. prey catching) is controlled by (perceptual) states indicating success conditions of that activity (frog food), then the success of that activity will greatly increase and be advantageous for the organism. In the frog example, different perceptual states have different effects on the prey catching system, some perceptual states trigger approach behaviors and snapping, some other perceptual states inhibit approach, and perceptual states can also orient locomotion in a specific direction (for details on frog's prey behavior, see Neander 2006). Perceptual states not only have these advantageous effects on behavior, but were also selected to have these effects, because they greatly increase the success of that behavioral system. We can call all these selected effects of perceptual systems and states upon some activity the *control function* of that perceptual system or state. In the frog example, perceptual states have the function to control approach and snapping behavior.

The *control function* of perceptual states, their effect on other activities of the organism, is explained by their relation to the success conditions of these activities. They exercise control over activities, because they increase the success of these activities. And they increase the success of these activities, because they indicate some properties related to the success conditions of these activities. The control functions of perceptual states can explain why they have *indicator functions*. They have effects on certain activities and therefore get control functions, the function to have these effects on behavior, only if they indicate certain conditions in the environment. They get indicator functions, because they have the function to control certain activities in such a way that they are exercised in advantageous conditions. The perceptual states exercise that control, if they indicate these conditions or properties which correlate with them. So, the function to represent some properties of the environment can be explained by the effects of perceptual states, by their effect in the control of other activities (or behaviors).

Millikan (1989 and 2004) supposes that the states used by the consumer systems represent the conditions of proper functioning of the consumer system, i.e. the success conditions of the consumer system. The frog's perceptual state has as content "frog food" because that is the condition of proper functioning of the consumer system (the prey catching system or the frog's digestive system). But the frog actually has no "frog food"-detector. No

state in the frog correlates *only* with frog food and not with fake frog food (e.g. beebees). It would be certainly selectively optimal, if frogs had a frog food-detector, but it is questionable that they actually have such a highly advantageous system. They do not have a capacity to distinguish frog-food from fake frog-food, flies from beebees. It is questionable to ascribe the conditions of proper functioning (the success conditions) as content to perceptual states. But the success conditions certainly explain why perceptual states acquire their control function and their indicator function and therefore their representational status. Only insofar as a property indicated by a perceptual state correlates with the success conditions, does this perceptual state acquire a control function and an indicator function; only insofar does the perceptual state acquire the status of a representation.

We can sum up in Fig. 2 the developed explanation by improving on the drawing given previously (in Fig. 1). *C* (e.g. a black flying dot) is the cause of a perceptual state *E* which has effects upon the system *M* (e.g. snapping behavior). We can say that *E* exercises some control over the activity of system *M* (it gets a control function: it has for example the effects of triggering, inhibiting or orienting the snapping and hunting activity of *M* and has the function to do so). It does so, if *E*-triggered *M*s are more successful than non-*E*-triggered *M*s. To determine the success of *M*, we have to know its function: If *M*s function is *R* (e.g. the function of the snapping behavior is to catch a prey), then *M* is actually successful, if it does *R* (catch frog prey or frog food). The success of *M* depends on some external conditions (success condition *SC*, e.g. the presence of frog food). If that condition obtains the activity of *M* has the "desired" effect *R*, otherwise not. Now, it would be selectively advantageous for any system M, if it were controlled by a mental or perceptual state which correlates with its success conditions (*SC*) in such a way that *M* gets triggered when the success conditions (*SC*) obtain and inhibited when they are absent.

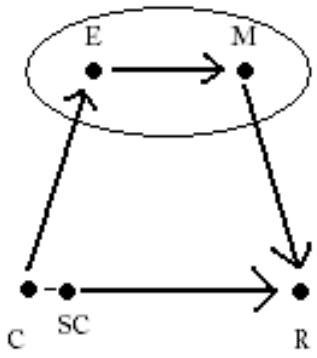


Fig 2: Causal relations involved in a perceptual representation (arrows indicate causes, the line between C and SC just a correlation)

The most advantageous would certainly be an indicator of the success conditions (*SC*), but it is sufficient if *E* indicates some property (*C*, e.g. flying black dots) which correlates positively with the success conditions (in a specific frog environment, most flying black dots are frog food, although perhaps not all). Such a *C*-indicator could already be selected to control the activity of *M* in such a way as to increase its success. Therefore such a *C*-indicator could acquire a control function and a function to indicate *C*s, even if it does not indicate the success conditions of *M* (success conditions are frog food, not flying black dots, i.e. flies *or* beebees). So the success conditions of some system which "uses" perceptual states explains why these states acquire representational status, although the success conditions need not themselves be the content of these perceptual states. A perceptual state (*E*) gets the function to indicate a property (*C*), if that property correlates positively with the success conditions of the consumer system of the state.

I did not say anything until now about the *type of correlation between the represented property (C) and the success conditions (SC)*. *C* may be identical with *SC* (e.g. a mental state may indicate "frog food"), *C* may be a determinate property of the determinable SC (e.g. "fly" as a determinate of the determinable "frog food"), *C* may partially overlap with SC (C may be "flying black dots" where some of them are frog food and some are not) or *C* may just locally correlate with success conditions. This is the case with the example of the marine bacteria which has an internal state indicating a property (*C*) of the magnetic field (or magnetic north), a property which correlates in that specific environment with anaerobic conditions (*SC*), the conditions in which the bacteria can survive. The correlation is not a lawful one, but just a local correlation. But that is sufficient for the indicator of the property of the magnetic field to get selected and acquire an indicator function. The weaker the relation between *C* and *SC* the likelier it is that the perceptual state does not fulfill its function to control activities (*M*) in such a way that the activity *M* is successful, i.e. satisfies the function it was selected for (namely doing *R*).

(2) *Content*: In the previous paragraphs, I showed how representational status is explained by the success conditions of the consumer systems of a perceptual state. Here, I will emphasize that in the case of perception, the representational content of perceptual state is the property that state has the function to indicate. I will follow here Dretske's explanation (Dretske 1988) that a perceptual state is an indicator of property P, if it was *caused* by that property in the past. A state can be an indicator of property P, only if P causes that state. Such an indicator of P can acquire an indicator function. Given that indicator function, this type of perceptual state can represent also P if it is not *actually* caused by P. But it cannot acquire the function to

indicate P, if it was not caused by P in the past.

The way a mental state acquires representational status is not limited to mental states which indicate their cause. We can have mental representations which were not caused by the properties, objects or facts they are about. Why limit the content of perceptual states to the actual cause or past causes of these states?

Generally it is considered a case of misrepresentation when we see a property or object which did not cause that perceptual state or perceptual experience. If we have an experience as of something red but nothing red caused that experience, we consider that the perceptual experience deceived us. This is not the case with other types of mental states. We can very well believe something although the fact we believe did not cause that belief. That would not be a reason to doubt the veridicality of the belief.

Millikan supposed that the content of perceptual states can go beyond the cause of these perceptual states. In the case of the marine bacteria, she attributes the content "anaerobic water" to the states of the bacteria's magnetosomes, although these states are caused by some properties of the magnetic field and not by the level of oxygen in the water. But the anaerobic water is the condition of proper functioning of the bacteria's consumer system, therefore on her view also the content of the state. Neander (2006) rejected this view for the reason that this attribution of content goes beyond the discriminatory capacities of perceptual systems. A bacterium could not distinguish between a magnetic field in *anaerobic* conditions and such a magnetic field in *aerobic* conditions. It can only distinguish between different properties of the magnetic field. Neander defends that argument in a close analysis of the frog example. The perceptual system of frogs is incapable to distinguish between flies and beebees. Frogs react exactly the same way to these two objects. Frogs react only to a certain combination of shapes and movements (e.g. long objects moving in a horizontal direction, like worms). To attribute to these perceptual states the content "frog food" would go far beyond the discriminatory capacities the frog's perceptual system has. For Neander, we should not go beyond the discriminatory capacities of perceptual systems in our attribution of content and not beyond the causes of these perceptual systems.

If the content of a perceptual state is limited to the past causes of that type of state, then there is still the problem of determining which object or property in the causal chain is represented. A plausible answer is that a perceptual state represents that cause which correlates closely with the success conditions of its consumer system. A perceptual state has a large spectrum of causes (all the properties in its causal chain), but it has the function to indicate only a certain property, namely that one which is responsible that the perceptual state

gets some control function relative of a consumer system. It is because the perceptual state of the frog indicates flying black dots that it gets its specific function in the control of the snapping behavior of the frog. Would it only indicate retinal stimulations of flying black dots, it would not get that control function and therefore it would not acquire an indicator function. Or, what a perceptual state represents is only determined by the property it has the *function to indicate* and not all the properties it indicates.

So the cause of a perceptual state gives the range of possible contents, and the actual content is picked out of one of these causes, namely the cause the indication of which has a selective advantage. If that cause is closely related to the success conditions of the system which uses the perceptual state, that cause will be picked out from the chain of causes.

I will argue in the next chapter that basic perceptual properties like edges, shape, color, size and movement are represented in perceptual content (in this case of vision). Higher order properties like kind properties, dispositional properties or causality may be represented, but it is questionable that all these properties can be so represented by perception. I will especially argue in the next chapter that perception does not represent kind properties like *being a fly* or *being frog food*. So, what is represented by perception and what is picked out from the cause of a perceptual state are the basic properties of objects and configurations of such basic properties, additionally perhaps dispositional properties, but not kind properties.[68] To take again the frog case, what he perceptually represented when he sees a fly is *flying black spots*, a configuration of basic visible properties of the fly (blackness, movement, shape).

I did still leave open the second problem of indeterminacy related to the question whether the more or the less determinate properties of an object are represented. We represent for example the color of an object (one of the mentioned basic properties in visual perception). But do we represent the object as being blue or as being turquoise? At which level of determinacy do we represent color? A plausible explanation is that in perception we represent the most determinate property we get information about.[69] If the reflectance properties of turquoise$_1$ and turquoise$_2$ cause the same perceptual state in us, then we do not get information about the specific property turquoise$_1$ but we only represent perceptually that the object is turquoise or only that it is blue, a less determinate property than the specific shades of turquoise$_1$ or turquoise$_2$. Given Dretske's notion of information, there is information about a property X in a state S, only if the probability of X given S is 1. If both turquoise$_1$ and turquoise$_2$ would cause the perceptual state S, then we have neither information about the

[68] On basic properties, see p. 156.
[69] I presuppose here the notion of information as developed in Dretske (1981).

specific shade-properties turquoise$_1$ nor turquoise$_2$ at S. But we have still information about the less determinate property turquoise at S. Whenever there is perceptual state S, the probability that it was caused by something turquoise is 1 (while the probability that it was caused by something of the specific shade turquoise$_1$ is less than one). We also would not be able to discriminate between these two shades of turquoise. Given these conditions of the flow of information, we can say that S represents the less determinate property turquoise, but not the more determinate one turquoise$_1$ or turquoise$_2$.

That explanation is plausible, first because we cannot shift between more and less determinate properties in our perceptual representation without changing our relation to the environment. It depends on the conditions of the flow of information and not on the deliberate way we categorize or conceive some external object or event, contrary to the case in conceptual representation (beliefs). We cannot see an object once as instantiating the property blue and once as instantiating the property turquoise (although we can switch in such a way in our doxastic representation of the object). So, we do not visually represent the determinate property turquoise *and* all the less determinate color properties, but a property only at one level of determinacy. Secondly, it is plausible that we cannot perceptually represent a property we do have no information about. Or, in the case of illusion, we cannot represent or misrepresent a property the perceptual state does not have the function to get information about. So, we cannot represent a determinate property of an object if the perceptual state has only the function to get information about a more determinable one.

5. Intentional Object and Failed Reference

Intentionality is the capacity to refer to objects or properties which may not exist. It is one defining feature of intentionality that the existential quantification over the intentional relation fails.[70] If I have a perceptual experience of a red object, this does not imply that there exists a red object. Given that the intentional object of perceptual experiences may actually not exist, it is supposed that what we perceive in that case is some intentional object of a different nature than the common external objects of our environment. The intentional object is sometimes conceived as an abstract object (Lycan 1996) or as uninstantiated properties (Dretske 1995). It is supposed that we perceive these abstract objects or properties when we have an experience of some object although such an object is lacking in our environment.

On the view developed in the previous sections, perceptual states are perceptual

[70] See chap. 1, section 2

representations, if they have *indicator functions*. A perceptual state has the function to indicate or refer to some property, for example something red, and it succeeds to refer to that property (redness), if there actually is some object in the range of our visual field which actually has that property. If there is no such object which instantiates the property redness, then the perceptual state *fails to refer* to that property. The perceptual state still has the function to refer to that property although it fails to do so. A perceptual state with such an indicator function is a representation of redness which fails to accomplish its function. When I have such a perceptual state, I token a perceptual representation of redness which fails to refer to something red.

We can compare failed reference in perception to *indexicals*. The indexical "this cat" has the function to refer to cats. It *should* indicate cats and not dogs. When I point to a dog and say "this cat", the indexical fails to refer. It keeps the function to refer to cats although fails to do so in the actual context. That indexical misrepresents a dog as a cat and fails to refer to what it is supposed to refer. We can have similar indexicals for properties, for example "this red". Such an indexical uttered in a context where there are only green things would fail to refer to red things and would misrepresent something green as red.

In such cases of failed reference, we do not have to suppose that there is some intentional object which instantiates the property which is absent in the given context of utterance. We can give a similar explanation in the case of perception. A perceptual state has the function to indicate or refer to certain properties or objects in the context of the perceiver. Perceptual states have the function to refer to specific properties. A perceptual state typically caused by red objects cannot refer to green ones. It has the function to indicate redness. If such a perceptual state is tokened in a context which does not instantiate redness, the state fails to refer to redness while keeping the function to do so. It is a representation of redness which fails to refer to a red object. The fact that it is a representation derives from the function of the state, from what such types of states did in the past (refer to red things), it does not derive from an actual relation to something, an abstract intentional object, which instantiates redness. A heart has the function to pump blood and it usually does so. When it fails to fulfill its function and does not pump blood, the heart still keeps its function to pump. For that reason we say that the heart fails to do what it is supposed to do. But it would be absurd to say that the heart keeps that function because it is related to some abstract entity which instantiates the properties of the substance it is normally related to, some abstract entity which instantiates the properties of blood. Similarly, a perceptual state which fails to refer can still have a representational function without the need to postulate some abstract intentional object

which instantiates the property the perceptual state (type) is normally related to, or without the need to postulate some uninstantiated properties.

In order to explain the intentionality in perceptual misrepresentation, there is no need to postulate abstract intentional objects or uninstantiated properties. But the previous explanation just gives an account of the *intentionality* of perceptual states. It does not address the problem of an explanation of *phenomenal consciousness* of perception: How can we have the phenomenal experience of something red, if there is nothing which instantiates redness in our environment? Is it necessary to reintroduce uninstantiated properties or abstract objects which instantiate properties to explain our phenomenal consciousness in the case of perceptual misrepresentation? I cannot address that question here. The aim of the previous argument was just to show that for an explanation of intentionality of perception, it is not necessary to introduce such abstract entities.

Conclusion

I tried to defend in the present chapter a version of a naturalistic semantics in order to explain the intentionality of perception. Such a theory gives us some criteria to attribute content to perceptual states. I followed Dretske and Neander in the view that the content of a perceptual state is given by the indicator function a perceptual state acquired. But I gave a different explanation of the way such indicator functions are acquired. The indicator semantics needs to be supplemented by a consumer-based teleosemantics to explain how perceptual states get indicator functions. The present combination of an indicator semantics and a consumer-based semantics gives two criteria for the attribution of content. First, the content depends on the cause of a perceptual state. Secondly the content depends on that cause of a perceptual state which is closely related to the success conditions of the activity upon which the perceptual state exercises a control. Because the perceptual state has this cause, it gets its function to indicate that cause and to represent it. This view of content as indicator functions can be applied to a satisfactory theory of the intentional object of perception which avoids to postulate abstract intentional objects and uninstantiated properties.

Chapter 5

The Representational Content of Perception and Illusion

Introduction

We have the intuitive feeling that our perceptual experience can deceive us. It can perceptually seem to us that there is an object with some property in front of us when there isn't. The intentionalist view of perception explains this impression by the attribution of content to our perceptual experience. Perception presents the world in a certain way and the world may be different from the way it is presented in perception. Perception can misrepresent. The way the world is presented is determined by the content of perception and that content can differ from the actual states of affairs in our environment. On that view, perceptual experience has the capacity to be erroneous. Strongest support for this intentionalist view comes from the phenomena of illusion and hallucination, where we seem to see objects or properties that are not there. In chapter three, I examined and criticized the relationalism about perceptual experience, because it rejects the attribution of semantic content to that experience. It rejects the content view. If such a content is rejected for perception, it becomes difficult to give a satisfactory account of illusions. On the other hand, intentionalism and the content view can only give a better account of illusions, if it has a coherent account of content. It has to be shown that a theory of intentional content offers a better account of illusions and perception more generally than relationalism. With this purpose, I will discuss the theories of perceptual content and propose a version of Russellian propositional content which is best fit to explain veridical and illusory perception. I will discuss the advantages of that theory and apply it to an explanation of common perceptual illusions. Finally I will show that the advantages of relationalism can also be captured by such a theory of perceptual content. Given that such a theory of perceptual content can better explain illusions than relationalism and given that it avoids the inconveniences relationalists attribute to the content view, it is preferable to opt for such a content view against a relationalist view.

In a first part of this chapter, I will expose the intentionalist explanation of perceptual content and especially of the content of perceptual illusions and I will address some problems in that explanation of illusions. In a second part, I will discuss different theories of propositional content for perceptual representation. There, I will defend a Russellian view of propositional content. In a third section, that theory of propositional content will be applied to

the explanation of illusions. I will show how the shortcomings of some intentionalist views of illusions can be avoided. In a final section, I will discuss if the relationalist arguments against the content view apply to the specific view of Russellian content developed in this chapter.

1. Intentionalism, Content and Illusions

The content view about perception defends the position that perceptual experience or perceptual states have intentional content. Intentional content has to be distinguished from other forms of content. First, from what is sometimes called sensational content (Peacocke 1983). *Sensational content* just designates the quality I experience when I have a conscious perceptual state. When I have an experience of red, then this chromatic quality is part of the sensational content of the experience. Sensational content differs from intentional content because it needs not to be about something. Sensational content just says that I have a red-experience, but does not say if that experience is about any property in the world. It is equivalent to what is also called the phenomenal character of experience. The intentional content of experience to the contrary says what the experience is about, which property, object, relation or situation in the world it represents and it is about.

Intentional content differs also from *informational content* (Peacocke 1983, Dretske 1981). Informational content is a property of natural signs which vary causally with certain properties. Smoke is for example a natural sign of fire and varies causally with the presence of fire. In that sense, smoke carries information about fire. It has the informational content that there is fire. Intentional content differs from informational content because it can misrepresent objects or properties. It is a higher form of aboutness than information, because it can wrongly indicate something. It can represent a property which actually does not obtain. We can define a mental representation as any mental state which has intentional content. Those who defend the content view take perceptual experience to be a mental representation (Siegel 2010). But perceptual experiences are limited to conscious perceptual states which have a phenomenal character. Given the possibility of unconscious perceptual states, the content thesis can be extended more generally to perceptual states, whether they are conscious or not. I will speak here about perceptual states in that general sense as a conscious or unconscious state of perceptual systems which has intentional content.

Intentional content specifies accuracy conditions. And the content view can be equated with the view that perceptual states have such accuracy conditions. These conditions must be satisfied in the world in order for the perceptual experience to be accurate. But contrary to

informational content, intentional content may specify conditions which do not actually obtain. The perceptual state may be inaccurate. It may occur in situations, where its accuracy conditions are not satisfied. So, perceptual states having accuracy conditions can be evaluated relative to situations or worlds. If the content of my visual state is a red square, then that state is accurate only if there is a red square in the specific situation where I find myself.

On this representational view of perception, perceptual states are seen in a way similar to *propositional attitudes*. Beliefs can be semantically evaluated as true or false and perceptual states can be semantically evaluated as accurate or inaccurate. Like beliefs, perceptual states are about something and can falsely represent something. We can attribute error to beliefs and to perceptual states. Despite these similarities, there are also *differences between perceptual states and propositional attitudes*.

First, attitudes can be evaluated independently of the content of the attitude. We can evaluate the belief state and the content of the belief. If I believe that Barcelona is Europe´s biggest city, the content of my belief is false and my attitude is inappropriate. But if I doubt or desire that content, the attitude can be appropriate. But is there also such a difference between an attitude and a content in perception? Perception seems to be like the belief attitude. If the content is inaccurate, the "perceptual attitude" is automatically evaluated as inappropriate.

Secondly, contrary to belief, where we can change the attitude towards the same content, it is impossible to change that specific "perceptual attitude". If I have a perceptual state with a certain content, it is difficult to imagine that I can have a perceptual state of a different type towards exactly the same content. If I hear a sound in the street, could I have another attitude which has exactly the same content, that sound at that distance with these and these qualities? We can see a triangular shape and we can also get the same information about its shape by touch. But the touch experience would have some additional content about temperature, resistance and texture of the triangular shape, a content which is not present in the visual experience. Chalmers (2006) defends the position that we can apply the distinction between attitude and content to perceptual representations. Such a distinction may only be defended in some limited cases, but in most cases of perceptual experience, it is impossible to draw that distinction.

A third, often emphasized difference between perceptual states and propositional attitudes concerns the difference in the content of states involving concepts and other mental states which do not. A belief is constituted by concepts. Most intentionalists claim that, contrary to beliefs which have conceptual content, perceptual states have non-conceptual content (Tye 1995 and 2006, Dretske 1995), while some defend that perception has also

conceptual content (McDowell 1996, Brewer 1999).

Despite these differences between propositional attitudes and perceptual states, intentionalism stresses the similarities. Both mental states have intentional content and the capacity to misrepresent. Those who reject the content view emphasize the fundamental differences between propositional attitudes and perception. They attribute content only to the former. But the obvious advantage of the intentionalist position is its capacity to explain perceptual error in illusions and hallucinations. In illusions, our perceptual states represent certain properties of perceived objects, although the objects we see do not instantiate these properties. The properties we experience are just properties represented by that experiences. As in the case of beliefs, what is represented by mental states needs not actually to be the case. As with false beliefs, we can have non-veridical perceptual states or experiences, states which represent properties although no object in our environment instantiates these properties. When I see the Müller-Lyer illusion, my perceptual experience represents one line as longer and one as shorter. The different sizes of the lines are just *represented* properties although the drawing does not instantiate these properties. When I see a grey square as white, the property of being white is just a property represented by the experience. If perceptual states are mental representations and have intentional content, there is a straightforward explanation of illusions (and hallucinations).

But the intentionalist position depends on a theory of intentional content for perceptual states. Several options to explain the content of illusory experience have been offered. We can group them into three options for an intentionalist explanation of the content of illusory perceptual states: the content can be (1) a conceptual content, (2) a Russellian content constituted by objects or properties, (3) a content conceived as a set of possible worlds. Let us expose briefly these options, before passing to a more extensive discussion of perceptual content in the next section.

(1) Either the content is conceived as a *conceptual content* (Schellenberg 2011a). In that case, the content of the perceptual experience is constituted by concepts defined as abstract entities, either Fregean senses or intensions. A concept can fail to refer to an object or an instantiated property. We can have a perceptual state with a certain conceptual content, for example a content which contains the concept “redness”, although nothing in our environment instantiated that property, nothing is actually red. We have concepts which fail to refer. On this account we can therefore have perceptual states or experiences which have a certain conceptual content, but fail to actually refer. But such an explanation of perceptual content has the disadvantage that we perceptually represent objects and properties of the environment

only via some conceptual intermediaries, e.g. Fregean senses. Such an explanation is vulnerable to the objections from direct realism, that we have the impression to directly see objects and their properties and do not have the impression to represent them via some intermediary conceptual content. If Fregean senses are abstract entities, that view has furthermore the disadvantage to introduce abstract entities with a dubious ontological status as the intermediaries in the process of perception.

(2) Another intentionalist option is to avoid conceptual content and to treat the content as something which is directly constituted by the *objects* we see and by their *properties*. On that option, the content of veridical perception is directly constituted by the objects we see and the properties they instantiate. This view preserves the direct realist intuition that we represent directly the objects of the external world without the intermediary of some other content. But on that option, it has to be explained which objects and properties enter into the content in the case of illusion. In illusory experience, we represent a property which the seen object does not instantiate. We see a red object as green, a long line as short, or a straight line as bent. If the property which enters the content is not instantiated by the object, it is either an uninstantiated property or the apparent property is instantiated by an intentional, but non-actual object.

Dretske (1995) defends the view that we just represent properties which may be instantiated or not, while the object itself does not enter into the perceptual content. Lycan (1987 and 1996) defends the view that the apparent properties we see in illusions are instantiated by intentional objects treated as possibilia. When I see wrongly a red object as green, then I represent a possible object instantiating the property green. And that possible object is an object in an alternative possible world. For Tye (2009), we represent a "content schema" constituted by an empty slot into which different objects may enter and properties attributed to the value entering the empty slot. Such a content with an empty slot is generally called a gappy content. In illusions, the object which enters the empty slot does not instantiate the properties which the content schema attributes to it. This second, Russellian option for intentional content preserves our direct realist intuitions, but has the disadvantage that we need either a richer ontology of possible objects and uninstantiated properties to explain the content of illusions; or we find a way to explain intentional objects which avoids these abstract entities.

(3) The third option avoids these problems by identifying the content of perception with sets of possible worlds. Perceptual experiences represent sets of possible worlds. In the case of veridical perception, the actual world is part of that set, in the case of illusion it is not.

Recently, Tye (2011) opted for such a view. A combination of these three options is also possible, for example a two-dimensional view of content (Chalmers 2004) accepts a conceptual, Fregean content as one dimension of content and objects and properties as another dimension.

I will defend a version of option two which avoids ontological objects like possible or uninstantiated properties.

2. Propositional Content

2.1. Is Perceptual Content Propositional ?

I will first examine the question whether perceptual states have a propositional content or whether they have some type of non-propositional content. I will claim that there is no obstacle to describe perceptual content as a form of propositional content.

Most intentionalists defend the position that the content of perceptual states (or experiences) is propositional content. As we saw in chapter three, Siegel (2010: 28-29) distinguishes the Content View which says that perceptual experience has content and the Strong Content View which says that visual experience is a propositional attitude. The strong content view may be contested because of the already mentioned problem to distinguish between the propositional content and the attitude in perceptual experience. If we cannot have different attitudes towards the same content in perceptual experience, then it is inaccurate to treat perceptual experience as an attitude.

One can still argue that in perception we have always an *attitude similar to the belief* attitude. But even that is not obvious. When we know how we are tricked in perceptual illusions we withdraw our beliefs from the perceptual content we experience. One could still say in that case that our perceptual experience is an attitude similar to belief, but that this attitude is contradicted by our epistemic beliefs about the presented perceptual content. Our perceptual experience presents the world as being so and so, but we do not belief it. Perceptual experience would be an attitude similar to belief but different from our epistemic beliefs. But even that can be contested. There are perceptual experiences which are completely ignored by us or which are just treated as noise. The visual experience we have during the saccadic eye movements are usually completely ignored by us and treated as noise. The same is the case for perceptual experiences we have when our eyes are closed, i.e. some vague experience of color and sometimes rudimentary shapes. Usually these experiences stay completely unattended and are not taken to present us anything (on closed eye visual

experiences, see Schwitzgebel 2011: 139-159). They are neither used by our cognitive system to construct beliefs nor are they used in action, that is, we do not act on them. Which attitude would we have towards the contents presented in these experiences? Given that we cannot change our "perceptual attitude" toward the same content and given that it is hard to say what such an attitude would be, it is contestable that perceptual experiences are comparable to beliefs in the sense that they have an attitude part and a content part. But given that we cannot clearly specify "perceptual attitudes", this does not affect the thesis that experiences may have propositional contents.

This analysis does neither contest that perceptual experiences can occur in different factive states (the state of seeing) or non-factive states (the state of hallucinating and dreaming), nor does it contest that we can have different attitudes towards our perceptual experiences (believing, doubting fearing what one sees). It just contests that perceptual experiences or states are themselves composed of a content *and* an attitudes. It contests that there are some specific "perceptual attitudes" to be added to the usually mentioned propositional attitudes (beliefs, desires etc.).

We may therefore distinguish an intermediary view between the content view and the strong content view, an intermediary view which just says that perceptual experience has *propositional* content. That intermediary view avoids the question whether perceptual contents can be shared by different attitudes. We have then a difference between the content view which just claims that perceptual states have content and the view which says that this content is more specifically a propositional content.

Some philosophers have contested that the content of perceptual states is propositional, so Peacocke who describes perceptual content as either a scenario content or a proto-propositional content (Peacocke 1992). Crane (2009a) defends also the position that perceptual experience has pictorial content and not a propositional content.[71] One should not confuse here non-propositional content with non-conceptual content, because there can be a non-conceptual content which is propositional, for example Russellian content.

What distinguishes the content of pictures from propositional content and why should the perceptual content be like that of pictures? Crane presents three arguments against the thesis of propositional content of perception.

First, propositions are *bearers of truth-values*, they are either true or false, while

[71] There is also a general skepticism about the existence of such entities as propositions, see for example Iacona (2003). I let this general skepticism aside because the philosophers I treat here and who contest that perception has propositional content do not contest that other mental states (the propositional attitudes) have propositions as their content.

perceptual experience, like pictures, are only accurate or inaccurate. Accuracy is a gradual notion, while truth is not. For Crane, we cannot infer from the fact that perceptual experience has accuracy conditions that their content is propositional. We could only infer that if they had truth-values. I do not find this argument convincing. Crane does not say what it means exactly to say that accuracy is gradual. Either it means that only some aspects of an object are represented and other aspects not. On that view, a complete representation is more accurate, than a partial (or incomplete) representation. But this property is shared by any representation, be that a picture or a description by propositions.

Or, as second possibility, accuracy is gradual, because the represented properties are not represented in an absolutely determinate way. On this view, a representation of determinate properties is more accurate that a representation of determinable. A picture represents the size of an object only relatively to its surroundings, but does not represent an object as being, say, 1 meter rather than 1 meter 10. In that sense, a picture only represents determinable properties and not absolutely determinate properties. But here again this is not a property specific to pictures or perceptual experience. Most sentences expressing propositions contain predicates of only determinable properties. Sentences like “this tree is big” or “green” do not say in a determinate way how big this specific tree is or which shade of green it exactly has. If perceptual representations were accurate only to a certain degree because they represent only determinable properties, then most propositions would share that type of gradual accuracy.

A third possibility is that accuracy is gradual because sometimes only some parts of pictures or of perceptual representations are true while other represented aspects are false. On that view a representation in which all represented aspects are true, is more accurate than a representation which misrepresents some aspects. If a picture or a visual experience represents a cherry as red and flat, it represents truly its color, but not its shape. The representation is accurate only to a certain degree. On this view, perceptual states represent truly some parts. The representation is only accurate to a certain degree, because not all its parts are true representations. It is partly true, partly false. This view is the most plausible explanation of accuracy (see also Siegel 2010: 32).[72] But on this view, pictures and perceptual experiences can be true, like propositions. Only perceptual experiences (and pictures) can also be only partly true and therefore accurate to a certain degree. What perceptual experiences and pictures lack, is a truth function ascribing either truth or falsehood to the complex proposition, given the truth-value of their constituent propositions. So, the gradual character of accuracy is

[72] See the discussion on accuracy on p. 83-4.

not an argument for the thesis that perceptual experience is no possible bearer of truth-values and therefore not propositional.

Crane's second argument against the propositional content of perceptual experiences depends on the difference that *truth-functions* can be applied to propositions and not to the content of pictures or perceptual experience. The truth function of negation, conjunction, disjunction can be applied to propositions, but not to the content of pictures or experiences. The components of the content of pictures and perceptual experiences do not stand in logical relations, and pictures or perceptual experiences do not stand in logical relations to other pictures or experiences. It is questionable that there is such an absolute difference between propositions and the content of perceptual experience. Certainly, there is no clear truth-function giving a truth-value to the content of a complex perceptual experience. And certainly there are logical relation the content of perceptual experience cannot express, for example a disjunctive proposition. But there are other rudimentary forms of logical relations between the components of the content of perceptual experience. In impossible pictures (of the sort drawn for example by Escher), one part of the picture contradicts another part. And pictures express a form of conjunction. So, that difference between propositions and the content of pictures or perceptual experience is only a gradual one and not an absolute one. All representations need not be able to express all the logical relations a sentence can express in order to have propositional content. And we can certainly agree with the fact that the content of pictures or experiences is logically a simpler form of proposition than the propositions expressed by sentences.

Crane gives a third argument against the propositional content of perceptual experience and pictures, when he claims that propositions can be asserted while we cannot assert the content of pictures (or experiences) without adding some other propositional content, expressed for example by a sentence (e.g. "I believe this picture to be accurate"). But it is not clear why the force, in Frege´s sense, associated with a proposition should be essential to the attribution of propositional content to a representation.

Further arguments sometimes mentioned against propositional content are the *richness* and *fine-grainedness* of the content of perceptual experience. Richness means that a perceptual experience can represent a great amount of details and a very complex layout. Fine-grainedness means that fine differences of perceivable qualities (shades, pitches, tastes) can be represented in perception. Certainly the content of a visual experience is usually richer than the content expressed by a sentence, but there is in principle no limit in the complexity of a proposition. So, the richness of perceptual content is no argument against the attribution of

propositional content to perceptual experience. Concerning the fine-grainedness, propositions expressed by sentences can even represent more fine-grained differences than perceptual experiences. Concepts can express differences which are more fine-grained than differences in the object or property referred to, as shown in the difference in content between the concepts of “morning star“ and “evening star“ (Tye 2006). These concepts express a difference in content, although they do not refer to different objects or intrinsic properties of these objects. Color concepts can for example express a difference between “turquoise” and “cyan” although these concepts refer to the same shade of greenish blue. So, conceptual content can be more fine-grained than perceptual content. The fine-grainedness of perceptual content is therefore neither a reason to deny propositional status to that content.

Eventually the question whether perceptual content is propositional or not will depend on the theory of propositions one adopts. If propositions are defined as a set of possible worlds (Stalnaker 1976), namely all those worlds in which the accuracy conditions of the perceptual content are satisfied, then there is no strong reason to make a sharp difference between the content of propositions and the content of pictures. On that view, the content of pictures can also be given by a proposition, defined as a set of possible worlds. The same can be said for Peacocke´s scenario content, which fills out in a certain way the three-dimensional space around a center. Such a scenario content can equally be defined as a set of centered possible worlds and can therefore be treated as a propositional content. There is therefore no strong reason to reject the thesis that perceptual content is a form of propositional content.

2.2. Types of Propositional Content

2.2.1. How are perceptual state related to proposition?

If the content of a perceptual state is a proposition, as I defended in the previous section, then two questions have to be answered. First, what is the relation between the perceptual state and that proposition? Secondly, which theory of propositions captures best the content of veridical, but also illusory perception? I will briefly address the first question before I answer more extensively the essential second question.

Propositions give the accuracy conditions of a perceptual state. They say what must be the case in order for the state to be accurate or veridical. The perceptual states themselves are the vehicles of representation. They are the equivalents of the letters and sentences in linguistic representation. These vehicles have a propositional content. They are associated with a proposition. There are different ways to conceive that relation of the vehicle to the

proposition (see also Schellenberg 2011a: 3 and Logue 2009). I will mention four different possibilities: (1) either the content of the perceptual state can be expressed or described by a proposition. But such a relation is too weak because even someone rejecting that perceptual states have propositional content can agree that its content can be described by propositions. That weak relation to a proposition can be rejected, because it falls back on the position criticized in the previous section. (2) Another possibility is that the perceptual state represents external objects and properties by being *associated* with a proposition. In that case, the proposition is neither represented, nor do we need to be aware of the proposition. What is represented and what we are aware of are the external objects. (3) A third possibility is that we represent the external world, its objects and properties, by representing a proposition. This relation to the proposition can also be conceived as a relation of awareness: we represent external objects by being aware of a proposition. This third possibility has the disadvantage that the representation of the external world becomes indirect. Such an indirect realism, where external objects are represented through the awareness or representation of other mental entities has become strongly contested since the rejection of sense-data theories of perception, which conceived perception as such an indirect relation to external objects. (4) A fourth option is that the represented objects (and properties) and the proposition overlap. This is the case in Russellian propositions, where objects and properties are components of the proposition. In that case the perceptual experience represents components of the proposition (objects and properties) and perceptual experience consists in an awareness of these components.

Those who think that propositional attitudes are relations to a conceptual content expressed by a that-clause, opt generally for a model similar to (2) or (3). A Fregean view of propositions considers them to be constituted by concepts. And these concepts have a reference; they refer to objects and properties of the world. If propositional attitudes are relations to Fregean propositions, then they are relations to concepts and to the objects refered to by these concepts. Either we represent objects and properties by having representational vehicles associated with a Fregean proposition (option 2), or we represent objects and properties by representing a Fregean proposition (option 3). On these two options, we have two levels of content, the propositional content and the content which consists of the entities of the external world, i.e. objects and properties (for an explicit defense of such a two level view of content, see Chalmers 2004 and 2006). If perceptual states, or more generally representational vehicles, are associated with Fregean propositions constituted by concepts, then option 2 or 3 is the most probable relation between perceptual states and propositions.

Russellian propositions permit a relation of the type described in the last option (4).[73] That fourth option captures best the direct realist intuition that we directly represent external objects without representing some intermediary mental entities.

Before answering the question about the relation of perceptual experience to propositions, we have to look closer at the different constituent of propositions. And we have to address the question which theory of propositions is the most adequate for an account of perceptual content. It is not necessary here to defend a theory of propositional content which could apply to all types of mental representation (propositional attitudes, emotions, mental imagery, perceptual states etc.) and therefore to all types of mental content. It is possible and even probable that the content of perception is a different propositional content than for example the content of the usual propositional attitudes.

So, which theory of propositions is the most adequate for perceptual content and which components does the propositional content of perception have? Accounts of propositions are generally divided in those which suppose that propositions are unstructured and those which suppose that propositions are structured. Structured propositions are further subdivided into Russellian propositions and Fregean propositions. There is a further distinction between singular propositions and propositions with existential content i.e. propositions involving only existentially quantified variables, properties or concepts, but no singular entities.

2.2.2. Structured or unstructured propositions

Let us first address the question whether perceptual content is *structured or unstructured propositional content*. On the unstructured account, propositions are not defined by any constituents and relations between them, but they are defined by a set of possible worlds (Stalnaker 1976). A perceptual state is veridical only if the actual world is member of the specified set. But the perception of a red apple is not simply accurate, if there is a red apple in the actual world. It is only accurate if there is such an apple in the close environment of the perceiver at a specified spatial location. This feature of perceptual content can be captured by introducing centered worlds (Quine 1969). Centered worlds are possible worlds which have as center a moment in time and an individual or location in that world. The content of my perceptual state, when I see a red apple, can therefore be given by the set of centered possible

[73] If the entities of the external world are thought to be somehow conceptual, than Fregean propositions could also permit this fourth option. McDowell seems to defend such a view (1996). But it seems to me that such an extreme ontological position, namely an idealism where the common objects of the external world are identified with concepts is quite hard to swallow.

worlds where the apple stands in such and such a relation to the defined center, for example a perceiving individual.

Are unstructured propositions sufficient to capture perceptual content? Unstructured propositions have the disadvantage that they cannot define content in a way which is fine-grained enough for the content of some mental states or linguistic expressions. For example, necessary propositions are true in all possible worlds and are therefore defined by the set of all possible worlds. Analytic sentences such as "Bachelors are unmarried men" and "Brothers are male siblings" express therefore the same proposition on the unstructured account (King 2011).[74] But we would certainly want a theory of propositional content which makes a difference between these two expressions. The same problem arises for contradictory sentences. They all express the empty set. Is that a problem for perceptual content?

There are many perceptual contents which are contradictory. When we see Escher´s drawing of impossible objects, we represent for example contradictory spatial properties. The men on the endless staircase are endlessly ascending but at the same time they stay in the same spatial region; the staircase is increasing and not increasing in height (see Escher´s drawing "Ascending and Descending", 1960).[75] Similarly with auditory perception, in the Shepard tone we perceive an infinitely ascending sound which at the same time stays in the same limited interval (Shepard 1964). Obviously, neither the drawings nor the sound (the physical objects) are impossible and their features could be modeled by a set of possible worlds, but the content represented by the experiences caused by these drawings and this tone is. An unstructured account of propositions would ascribe the same content, namely the empty set, to all these different perceptual experiences which represent contradictory contents. That is quite unsatisfactory.

The unstructured account of propositions is not fine-grained enough to capture some aspects of perceptual content. Unstructured propositions are insufficient for an account of perceptual content. But we need not reject the unstructured account as long as we complement it with a structured account of propositions. On the structured account, the components of the representational vehicle (of a sentence or of perceptual state conceived as a complex neural state) play a role in determining different components of the proposition. The unstructured account can be combined with the structured one, if, beyond the sets of possible worlds, the

[74] I do not want to defend here my specific examples for analytic sentences, but I just want to say that sentences which are true in all possible worlds have the same meaning or content on the given reading of propositions. I am fine with Quines objections to the given examples of analytic sentences.

[75] Escher´s drawing "Belvedere" (1958) shows another good example of a spatially impossible object, a long rectangular pavilion oriented in one direction and at the same time in another direction perpendicular to the first one.

vehicles and their structure play a certain role in determining the components and the structure between these components. If the components are for example defined as objects and properties, we can define the content as the set of possible worlds where these objects instantiate these properties.

2.2.3. Fregean propositions

But which structured proposition can capture perceptual content in the best way. Both Fregean and Russellian propositions involve components and a structure between them. But these two types of proposition have components of a very different nature. Let us look first at *Fregean propositions*. The components of a Fregean proposition are concepts. On the Fregean view, concepts are abstract entities and not psychological entities like mental representations (or Frege´s "Vorstellungen"). The components of Fregean propositions are intensions or Fregean senses ("Sinn") (Frege 1892). These concepts determine their reference and they explain also the cognitive role they play in one´s mind. Concepts which refer to the same object or property, but which play a different cognitive role are to be distinguished as two different concepts. Fregean propositions have a major advantage over other views in the explanation of perceptual content. They can easily explain non-veridical perception (illusion and hallucination). In illusory cases, the content is a proposition into which a concept enters which does not refer. When we falsely see a grey square as white (as in Adelson´s checkerboard illusion), the concept of "whiteness" enters the content, but fails to refer to that property. The concept is empty because it has no referent. Still the intension or Fregean sense can explain the appearance of something white, the phenomenal character of our experience, although nothing white is before us (see Chalmers 2004 for such an explanation of illusions based on Fregean content). If concepts are conceived as representational vehicles (terms or mental states) which directly refer to objects and properties, it is less evident to explain what they contribute to the content of the representation in the case they are empty and fail to refer (Everett 2003).

But this advantage of a straightforward explanation of illusions by empty concepts is counter-balanced by *two major disadvantages* for an account of perceptual content by Fregean propositions. The *first problem* is a growing skepticism about the abstract entities which are supposed to form the components of Fregean propositions. The Fregean view of concepts still relies on the classical view of concepts i.e. concepts as definitions or feature lists which determine reference. Such a classical view fits less and less well with the growing literature on concepts from the cognitive sciences (see Laurence and Margolis 1999).

Schellenberg (2011a), who defends a view of perceptual content as Fregean propositions, emphasizes that the components of Fregean propositions are not the mental states or representations postulated by the cognitive sciences. But it is certainly more in harmony with empirical research to identify concepts with psychological entities, namely mental representations (a view adopted by Laurence and Margolis 1999 and Prinz 2002). Furthermore it is unclear how the representational vehicles, the mental and perceptual states, are related to such abstract entities. Are they "associated" with the mental states? Are these concepts "grasped" by us? Do we represent the world "through" them?

A *second problem* with Fregean propositions is that they constrain to postulate two levels of content, the conceptual content given by the intensions or senses in the Fregean proposition and the content given by those entities which the concepts refer to, the objects and properties of our physical environment. Fregean propositions introduce an intermediary between perceptual states and the properties and objects they represent. The phenomenological argument of the relationalists[76] stressed that perceptual experience does not seem to present such an intermediary step. We seem to be directly acquainted with external objects and their properties. Even if one rejects the relational conclusions drawn from this argument, such an intermediary is still an unnecessary postulation which is neither supported by our phenomenal experience nor by the research in the cognitive sciences.

2.2.4. Russellian propositions

A Russellian account of propositions avoids these two problems. So, let us look more closely at this view of propositional content. *Russellian propositions* have objects, properties or relations as their constituents. On this view, the common external objects and their properties that we experience in perception enter into the proposition. They are components of the proposition. But such a proposition is not simply a list of such objects and properties. It has a *structure* relating these components in a certain way. What are these components and the way they are related? And what are the advantages of such a view of content? I will answer these questions in three steps: (1) I will specify what the components (objects and properties) of such a propositional content are in the case of perceptual representations. (2) Then, I will explain the structure of a Russellian proposition. (3) Finally, I will emphasize the advantages of such a view of propositions for an analysis of perceptual content.

(1) Which objects and properties are the components of a Russellian proposition? Let us look first at *properties*: The Russellian view does not impose any limits on the properties

[76] See chapter 3, p. 73-4.

which can be components of a proposition. Any property designated by a predicate can be part of a Russellian proposition. But in the case of perceptual representation, there certainly are limitations. Not any property which can be represented by some mental state can also be represented by perceptual states. In the case of perception, the question which properties are part of the content can ultimately only be answered by an empirical analysis of perceptual processing. It depends on the empirical question whether a specific mental state representing property X is also a *perceptual* state.

We can generally distinguish between *basic properties* and *higher order properties*. In the case of visual perception, color, shape, texture, size, illumination and motion are generally mentioned as basic properties represented by perceptual states (Siegel 2010: 99, Brogaard 2012). Higher order properties are for example causality (seeing that one object causes another to move), kind properties (seeing that this is an oak), dispositional properties (seeing that object as being climbable). While the intentionalists agree that basic properties are represented by perceptual states, it is a matter of controversy if and which higher order properties enter into perceptual content. Siegel (2010) defends what she calls a "rich" content view which accepts higher order properties such as kind properties and causality as perceptual content, while Prinz rejects them (Prinz 2012). Nanay (2012) defends for example dispositional properties as part of perceptual content. The distinction between basic and higher-order properties is only vague and separates those properties which are incontestably represented by perceptual states from other properties which can be represented by mental states of a higher order, but perhaps not by perceptual states.

A further distinction has to be made between *intrinsic* and *relational properties*. One can call a property intrinsic, if an object can have it independently of its relations to other objects. A "relational" property depends on the relation the object has to other objects. This definition can be misleading, because it does not exclude that intrinsic properties are relational: the property that I have a heart is a relation of me to my heart, but it is not a relation to *another* object, because the heart is considered as part of me; so, it is also an intrinsic property of me. But this property is not relational in the sense defined here, because it does not depend on my relation to some *other* objects (see for a discussion of the criteria of intrinsicness, Weatherson 2006). If we follow that distinction, then some properties represented by perceptual states are intrinsic (form, texture, reflectance properties), while other properties are relational. For example, distance depends on the relation to an observer; movement depends on the inertial systems of the object and of the observer.

It is important to note that the distinction between basic vs. higher-order properties

does not overlap with the distinction of intrinsic v. relational properties. Some higher-order properties can be intrinsic properties of an object (being H_2O, being an oak), others relational, for example causality and dispositional properties. Something is climbable only relative to the organism which tries to climb it. Some basic properties can be relational (movement, distance, color), while others are intrinsic (shape). I will stay neutral here on the matter whether perceptual states represent higher-order properties. It is a matter which has ultimately to be decided by neurophysiological investigations. I address in this chapter only the question under which conditions a perceptual state represents accurately or misrepresents basic properties, be they intrinsic or relational. Therefore higher-order properties are not central here.

I have only to add some remarks concerning *kind properties.* I said in the last chapter that only surface properties of things and a configuration of such properties are represented.[77] This implies that perception does not represent such properties as "being a tree" or "being a fly", that is, kind properties. Siegel (2010: chap. 4) argues that visual experience can represents kind properties. She claims furthermore that the fact that a visual experience represents a kind makes a difference to the phenomenal character of that visual experience. A visual experience can represent the basic properties of a pine tree. When I learn to recognize pine trees, the visual experience represents not only these basic properties, but also the kind property that this is a pine tree and this difference in representational content makes a difference in the phenomenology of the experience, so Siegel's rich content thesis. Prinz (2012) emphasized that we have to distinguish between a modest version and Siegel's stronger version of the rich content thesis. The modest version accepts that kind properties can be represented by perceptual experience, but rejects that a representation of a kind property makes a phenomenal difference to the perceptual experience. It may be that a certain configuration of features represented by the perceptual experience is used to detect a certain kind of things. In this way the experience represents, besides the basic properties of an object, also a kind property of that object. In Prinz's version of rich content, it is only through the basic properties represented in perception that kind properties can be represented. But in Siegel's version, the representation of kind properties changes also the phenomenology of the experience. There are several reasons to prefer the modest version to Siegel's stronger one, as Prinz argues.

First, Siegel thinks that the acquisition of *recognitional capacities* (e.g. recognizing pine trees) changes the output of the perceptual process (of seeing a pine tree). But it is contested and even implausible in the neurosciences that such recognitional processes are

[77] See p. 137.

involved in the brain areas responsible for perceptual processing (Prinz 2012).

Secondly, Siegel's version of the rich content thesis conflicts with content *externalism*. For externalism, content depends on the relation to the environment. A duplicate of me on twin-earth has a different content if he stands in relation to different entities than me (for ex. to twin-water). But this difference in the kind-property represented does make no difference in the phenomenal character of the states of the duplicate. Given externalism, the kinds represented by mental states can change without a change in the internal states or the experienced phenomenology of the duplicates. This seems to contradict Siegel´s strong position that the represented kinds affect the phenomenology of experience.[78] But Siegel affirms that the phenomenal character of perceptual experience is not *identified* with content, but supervenes only on content (Siegel 2010: 114). So, there can be a change in content, for example from water to twin-water, without a change in phenomenal character. But Siegel thinks also that the phenomenal character of perceptual experience changes with the recognitional capacities one acquires: one gets to recognize pine trees and this changes the perceptual phenomenology of seeingpine trees. But these recognitional capacities depend on the internal constitution of an individual. So, changes in recognition capacities affect the phenomenal character of experience, but given externalism, change in content does not. So, content as conceived by externalists seems to be independent of the phenomenology of experience and phenomenology seems to depend on internal capacities. Or otherwise, Siegel would need to reject externalism and claim that content depends on internal factors like recognitional capacities. Both options, either admitting the independence of phenomenal character from the represented kind properties (wide content) or the rejection of externalism, speak strongly against Siegel's strong version of rich content.

Let us come back to relational properties. It is essential to accept *relational properties* as part of the propositional content in order to explain the role of perspectival properties, the fact that perception presents objects from a certain point of view and the fact that perceptual content changes with such points of view (Noë 2004). Besides perspectival properties, other relational properties are important, namely those which depend conjointly on the object and the situation in which they appear. Schellenberg calls these relational properties situation-dependent properties (Schellenberg 2008). Situation-dependent properties of objects explain for example the changing appearance of color under different conditions of illumination. This situation-dependent color property depends on the reflectance properties of the object and on the conditions of illumination in a given situation.

[78] With phenomenal externalism (Dretske 1996), the phenomenal character of the experience could change with a change of wide content. But Siegel does not explicitly adopt phenomenal externalism.

In principle, a Russellian view of propositions is liberal enough to accept all these properties as components, basic or higher-level properties, intrinsic or relational properties. Which properties actually enter into a Russellian content of perception depends on the capacities of perceptual states to represent such properties. And as I stressed, there are certainly limits for perceptual states here. There are properties which cannot be represented by these states, but only by certain concepts. A perceptual state can represent the property "redness", but not the property "being an uncle". Such a property has to be represented by concepts. Concerning the properties represented in perception, the main difference between Fregean and Russellian propositions is the fact that the properties enter directly as components into the Russellian propositional content, while on the Fregean view, the content of propositions is a conceptual content which refers to these properties.

What about the *objects* of perception? Some views of Russellian content suppose that only properties and variables are components of these propositions. In that case, the content just says that there is some object which has the properties specified by the proposition and which stands in the appropriate relation to these properties, for example the relation of instantiation. If the proposition predicates properties of an object, then the proposition just says that *some* object instantiated these properties. On that view, the object itself is not part of the content. Tye (2009) calls such a view of content the existential thesis. Such content contains, besides properties, just an existentially quantified variable which stands for some object. The content does not specify which particular object that is. Dretske seems to have such a view of perceptual content (Dretske 1995: 24-25), when he writes about perceptual representation that "there is nothing in the content of the representation, nothing the representation *says*, which makes it about this object rather than that object". On that view the object of a perceptual state is given by the context. Whatever object stays in a specific relation to the perceptual state and satisfies the conditions specified by the perceptual content is the object of the perceptual representation.

There are several disadvantages of the *existential thesis* about content. First, some examples of perceptual experiences which seem intuitively to be illusory are not inaccurate on the existential account. Let us suppose that I see a white cube in a yellow illumination placed next to a mirror. That cube reflects in the mirror and I have therefore the experience as of a yellow cube at some distance behind the location of the mirror.[79] That perceptual experience is inaccurate: there is no yellow cube and the cube we see is not located at some distance behind the mirror, but next to it and in front of it. But suppose we actually place a yellow cube

[79] See Grice (1961: 238) for a similar example.

behind the mirror. On the existential view of content, my experience would be accurate under that condition. There is some object which satisfies the accuracy conditions of that experience. But intuitively, we would still say that our experience represents inaccurately the white cube next to the mirror and does not represent at all that particular yellow cube behind the mirror. A view which states that the particular object we see does enter into the content can give a much better explanation of these intuitions about the accuracy conditions of the experience. The experience would be accurate, if the yellow cube behind the mirror were part of the content. But the object which actually is part of the content is the white cube next to the mirror, and it is falsely represented as yellow and as located behind the mirror.

Another problem for the existential thesis is veridical hallucination (Lewis 1980). In veridical hallucinations, we have by some strange coincidence a hallucination of the scene which is actually in front of us. We hallucinate for example the room we are actually in. Usually some evil demon or some scientist is invoked who is supposed to create in us such a hallucinatory state. But there is also a more realist but comparable scenario: Some dreams include so-called false awakenings (Green 1968). We dream that we wake up and find ourselves in our bedroom. In such dreams, we hallucinate that we are in the environment we are actually in, our bed and its surroundings. We have a veridical hallucination although we do not literally *see* our environment. If we follow the existential thesis, then we have in this case an accurate visual experience. At the same time, we have the feeling that something goes wrong in such visual experiences. If we suppose that the object of perception can be part of the content or fail to be part of it, then the difference of normal veridical perception and this hallucinatory case can be explained. So, the rejection of the existential thesis and an acceptance of singular objects as parts of perceptual content permits a better account of our intuitions about the veridicality of perception.

If the existential thesis is rejected, the perceptual experience can have gappy propositions as content, where the gap can be filled by a singular object. Once the gap is filled, the propositional content has a singular object as component (Tye 2009, Schellenberg 2011a). A major problem for gappy contents is the case of hallucination, because no object enters into the content when we hallucinate. In such case, either the gap stays empty, or some abstract object enters the gappy proposition (Tye 2013).

(2) A proposition is not only a series of components (objects and properties), but these components must be related in a certain way. A list of objects and properties does not per se form a proposition. A certain propositional relation needs to give the proposition a unity (King 2009, Soames 2010). If the constituents of a proposition are an object and a property,

then it has to be cleared what actually holds this object and property together in order to form a proposition. This question is different from the question what explains that an object instantiates or has a property. The later question is about the relation of a property to an object in a state of affairs. The question about the unity of the proposition is about the way the object and property are joined to form a proposition and not about the way they are related in the world to form a state of affairs. We have to hold propositions and states of affair separate, because states of affairs are generally considered as the entities which make propositions true. They are truth-makers for propositions, while propositions are truth-bearers. And obviously the truth-bearers cannot be identical with the truth-makers.[80]

King (2009) and Soames (2010) reject the thesis that propositions are entities which are independent of language and of intentional mental states. If we follow their analysis, the existence of a proposition depends on certain linguistic and mental facts. Independently of these features of language and the mind, there are no propositions. This view abandons the position that propositions are some eternal representations existing in some Fregean "third realm", independently of the psychological states of persons or the social facts about language.

Now, what are these facts which explain how objects and properties are related into a proposition? King (2007 and 2009) explains the structure of the proposition by the syntactical structure of the sentence expressing the proposition. A sentence is composed of terms and predicates which have a certain semantic value; they refer for example to objects and properties. These linguistic components are related by a sentential relation. This relation expresses for example the relation of ascription between the object and the property in the proposition. The sentence "the wall is white" has a term which has as semantic value the object wall and a predicate which refers to the property whiteness. These two linguistic elements stand also in a sentential relation which encodes ascription. The object designated by the term "wall" and the property designated by the predicate "white" are related by the relation of ascription: whiteness is ascribed to the wall. The structure of the proposition reflects the structure of the sentence and the sentential relation between the terms.

This view can be extended to propositions which are not expressed by sentences, but by other representations, for example mental or perceptual representations. Soames (2010) extends King´s analysis of propositional structure from language to other mental representations. Entertaining a proposition is identified by Soames with "specific acts of predication that occur in perception and both linguistic and non-linguistic thought" (Soames

[80] Exceptions are self-referential expressions.

2010). On such an extension of the view of King and Soames, the structure of a proposition depends on the structure of the vehicles of representation (sentences, mental states). The elements in a vehicle of representation, the equivalent of the linguistic terms in a sentence, stand in a certain relation and the components of the proposition reflect this relation within the vehicle. The different elements of a perceptual representation, conceived as a vehicle, a brain state in the perceptual system, are connected by certain relations. Given these relations, the objects and properties in the perceptual content are related in a certain way, a property is bound, for example, to a specific object. Unfortunately, although we can analyze sentential relations, it is still unclear what the relations in a perceptual vehicle of representation are. The neurosciences investigate this question with the so-called binding problem. Properties detected by the perceptual systems (e. g. color, shape, movement) are bound together to form for example the representation of an object (e.g. a colored moving shape). But how the different perceptual states which detect specific properties are held together is still an open question. But still, it can be supposed that in perception there is some equivalent for the predicative relation which holds together the components of the content of propositional attitudes.

We have now analyzed the different aspects of a Russellian view of perceptual content. We saw that a Russellian proposition has objects and properties as constituents and has a structure relating them. Based on this analysis, there are two ways a Russellian proposition determines accuracy conditions of a perceptual state. If a perceptual state has a Russellian proposition as content, then it is accurate if it actually refers to the components of the proposition (objects and properties). And the perceptual state is accurate if these objects actually instantiate the properties ascribed to them by the proposition, given the propositional structure. We have now to ask, if Russellian propositions are the best explanation of perceptual content. Can they explain the content of the different types of veridical and non-veridical perception? And especially, can they give a better explanation of perceptual illusions than the relationalist view of illusions we discussed in chapter three? And can they give a better explanation of perceptual content than the Fregean propositions we discussed above?

(3) Let us look first at the advantage of Russellian propositions over the Fregean view of content. How do Russellian propositions avoid the two problems mentioned in the discussion of Fregean proposition, i. e. the problem with abstract entities and the problem with intermediary levels of content? In a Fregean view of content, the intermediary level of content is conceived as an intermediary of abstract entities. So on that view the two problems mostly fall into the one problem about abstract entities. But for the moment, let us keep the

difference of two problems as it is possible to conceive these intermediaries as something else than abstract entities. So, how do Russellian propositions avoid these problems?

First, contrary to Fregean propositions, it does not involve any abstract entities the postulation of which may be in conflict with the entities accepted by the cognitive sciences. A Russellian proposition indeed only involves as components ordinary objects and their properties.

Secondly, on a Russellian view of propositional content, objects and properties are directly represented by our perceptual states without the intermediary of a content separate of these objects and properties. The Fregean distinction between senses and their reference is abandoned and the mental states are thought to refer directly to objects and properties.

A third advantage of the Russellian view is that it is easily combined with a causal theory of reference. The Fregean view on the contrary is usually seen as a descriptivist theory of reference, where the extension of a term is given by some description or feature list attached to that term. Or since Kripke (1980), the descriptivist view of reference has been submitted to an extensive criticism. In the causal theory of reference, there is no need for intermediary abstract entities which fix the reference of terms or mental states. On the Fregean view, concepts have the property to determine reference. They are abstract entities associated with mental states or linguistic terms. And these abstract entities determine the extension of the mental state or term. These abstract entities or concepts give either a description or a certain number of features. All entities which satisfy this features or this description fall under the extension of the concept. The term “Hesperus” has for example the sense “the star which appears the first in the evening sky” and it has as reference the entity which satisfies that description. The reference of terms or mental states is given by such Fregean senses or descriptions. On the contrary, the Russellian view does not presuppose such reference-fixing descriptions and reference-fixing abstract concepts. The Russellian view is therefore easily combined with a view where the reference is determined by the relation of a term or mental state to external circumstances, for example its causal relations to the environment.

But, as previously indicated, there is an advantage of the Fregean view of content in the explanation of the perceptual content of illusions. The Fregean view has a straightforward explanation of the case where we perceive some property which is not instantiated in the scene before us. In that case, the concept of that property enters into the content, but that concept has no reference. An explanation of illusion is essential for a viable theory of perceptual content. The Russellian view of perceptual content needs therefore to present an

equivalent explanation of failed reference. But it only keeps the previously mentioned advantages over the Fregean view, if it explains failed reference without reintroducing some abstract entities (abstract objects or senses). In the previous chapter I defended a version of the causal theory of reference which is an adequate explanation of perceptual content. This theory is able to explain how a perceptual state refers to objects and properties and it is able to explain how perceptual states can fail to refer to these entities. It can explain veridical and illusory perception. In the case of illusion, a perceptual state which has the function to refer to a certain property of an object may actually fail to do so. The property is part the content of perception and that content is false because the seen object does not instantiate that property (see my explanation in chapter 4, section 5).

3. The Content of Illusions

3.1. Two explanations of misrepresentation

I want now to explain the content of perceptual illusions by applying to them the previously developed view of perceptual content as a Russellian propositional content. That view of propositional content permits two different *types of misrepresentation*: first, a misrepresentation due to the falsity of the propositional relation between the components of the content and secondly a misrepresentation due to a failure to refer to one (or several) of the components of the propositional content. Let us examine these two types of perceptual misrepresentations separately.

In the first type of misrepresentation, it is the *structure of the proposition* which is false although all the components which enter into the proposition may be represented accurately by our perceptual state. The proposition is false, because the structure of the proposition relates the components in a certain way, but the components are actually not related in that way in the external state of affairs. Their relation is misrepresented. If my perceptual experience represents for example a white wall in a yellow light as a yellow wall, then we have a propositional content which has as constituents an object, a wall, and a property, yellowness. It is true that we see a wall and it is also true that we see something yellow, a yellow light. So it is not the components which are misrepresented but only their relation. A proposition has a propositional relation which indicates the structure between its components. As the wall seems to us to be yellow, the propositional content of the perceptual experience ascribes the property yellowness to the wall. And that ascription is false. The proposition ascribes a property to the object, although the object does not instantiate that

property. The wall is not yellow. The proposition represents falsely the states of affairs in front of us. But here, no component of the perceptual vehicle, no component of the perceptual state misrepresents any component which enters into the content. This is often the case in illusions where we see accurately an object and see accurately a certain property, but misattribute the property to the object we see.

Misrepresentation can also be due to *failed reference*, to the fact that we misrepresent a component of the propositional content. Here, the perceptual state fails to refer to a certain object or property. For example, something seems to be yellow, but there is nothing yellow in our environment. We can have a yellow after-image, a yellow patch of color instantiated by nothing, or we can see an actual object which falsely seems to be yellow. The property "yellowness" is not instantiated. In this case the perceptual state falsely represents something to be yellow, because it fails to refer to the property yellowness. This case of illusion is different from the first case and it is more difficult to explain, because it generates the problems mentioned above about the nature of the represented component, the nature of the intentional object. Is the property instantiated by an abstract object? Do we represent an uninstantiated property? Or do we have a concept of yellowness which fails to refer to an instance of yellowness? Do therefore these abstract objects, these uninstantiated properties or these concepts enter the content? It is important to distinguish this types of illusion from the previous one, because only here this problem of represented but not instantiated properties appears, while in the first type of illusion the propositional structure is sufficient to explain misrepresentation. As I argued in the previous chapter, the best explanation is that the vehicles of perceptual representation have content due to a function they acquire. But although they have that function, they may fail to fulfill that function. In illusions, failed reference to a property can be explained by such failure of a representational vehicle to fulfill its function.

Naturally, the two types of misrepresentation can be combined. I can see a property which is not instantiated by any actual object and I can ascribe that property to the object I am actually seeing. If nothing is yellow, but I see a white wall as yellow, than my perceptual experience represents falsely yellowness and falsely ascribes that property to the wall, which does not instantiate it.

What about cases where we see a round glass as oval from a particular perspective? The glass is round although we see it oval. Is that a case where we misrepresent a property ("ovalness") and falsely ascribe it to an object which does not instantiate it? That would be the conclusion, if we only accept the intrinsic properties of an object i.e. those properties an

object has independently of its relation to other objects. In that case, seeing something round as oval would be a misrepresentation of the second type because the round object does not have "ovalness" as its intrinsic property. But such a view which restricts perceptual content to the intrinsic properties of the objects would have radical consequences. We see for example that the form of objects changes when we walk around them although the object is not submitted to any change. The object itself does not transform. The change in form in our experience would be a perceptual illusion, if only the intrinsic properties of an object are allowed to enter perceptual content. As we constantly see changing shapes and colors due to our changing relation to objects, such a view would make most of our perceptual experience an illusion.

Hume (1739/1969) defends such a highly skeptical view about perceptual experience.[81] But such a view declares most perception as a form of illusion and would be quite an unsatisfactory position. It is therefore preferable to include, besides the intrinsic properties, the relational properties of objects as possible components of perceptual content. If relational properties are included into content, then the round object which looks oval has actually "ovalness" as its relational property. We represent accurately that property and correctly attribute it to the object which instantiates it.

Relational properties are essential to differentiate veridical perception from illusions i.e. cases where we represent some property the object does not instantiate. It is therefore important to be clear about the properties an object actually instantiates. I will show in the next section that there are two types of relational properties: *Mind-independent relational properties* which involve only relations of the object to features of the environment and *mind-dependent relational properties* which depend on the relation of an object to a specific mind or mental process.[82] A perceptual state is veridical, if it represents accurately the intrinsic properties or the mind-independent relational properties of that object. Mind-dependent relational properties depend on the specific and often idiosyncratic working of the mind and are not in that sense objective properties of our environment. They are properties objects instantiate given their relation to a specific type of mind. But they depend on the specific properties of the given mind and in that sense they are not objective properties of the entities we see. A special type of illusions is generated, if these mind-dependent properties are taken to be intrinsic properties of an object or mind-independent relational properties of that object. In this case of illusions, the intrinsic properties and the mind-independent properties are

[81] See in Hume (1739/1969), especially the chapter „Of Skepticism with Regard to the Senses".
[82] Schellenberg (2008) uses a similar distinction between "mind-independent", "situation-dependent" properties and "mind-dependent" properties.

misrepresented and we have misrepresentations of the second type defined above. To make this point more explicit, it is necessary to look closer at relational properties and especially at the distinction between mind-independent and mind-dependent relational properties.

3.2. Relational properties

Relational properties are ubiquitous and we are incapable to perceptually represent most of the relational properties an object has. In perception, only those relational properties play a role which influence the way objects appear. Different intrinsic properties (shape, texture, reflectance properties) affect the way an object appears to us. And so do certain relational properties, for example the distance, illumination or orientation of an object. The way in which distance, illumination or orientation changes, affects the way the object looks. In the case of relational properties, we have to distinguish two types: those relational properties which depend on the intrinsic properties of the object and specific features of the environment, and those properties which depend on the intrinsic properties of the object, environmental feature and specific properties of minds and mental processes. I call the first type *mind-independent relational properties* and the second type *mind-dependent relational properties*. Let us look first at the mind-independent relational properties.

Noë (2004) distinguished a certain type of properties presented in perception which he called *perspectival properties* (or P-properties). These are properties of an object which change with the *distance* of the object relative to a point of view, with the *orientation* of the object relative to a point of view or with the *illumination* of the object. When the object is farther away, it looks smaller (a sound appears fainter with a greater distance of its source). A plate looks once round in a certain orientation and once flat in another orientation. An object looks bright in a certain light and dark in another. The type of medium (air, water) into which an object is placed affects also the way that object looks. An object looks different in a foggy air than at a clear day. It looks different in water than in the air because light is reflected differently on the surface of the water. Neither the distance nor the orientation of an object, nor its relation to some source of light or to some other medium is an intrinsic property of that object.

I spoke about different “looks” and “appearances” of objects relative to points of view, illuminations or specific media. One may argue that looks and appearances are mind-dependent aspects. But Noë argues that the mentioned relational properties are objective properties of external entities and situations and are independent of the mind. Schellenberg

(2008) defends a similar position concerning properties she calls *situation-dependent properties*. Perspectival properties and situation dependent properties depend only on the intrinsic properties of the object and on the properties of the situation they are placed in, independently of the fact whether a mind perceives them or which type of mind perceives them. This is easy to see in the case of illumination. An object has certain reflectance properties which do not change with the environment it is placed in. But through different illuminations different light waves are reflected from the object. The light which reaches our eyes is different from one illumination to another. This changing "objective appearance" can be explained exclusively by the reflectance properties of the object, an intrinsic property, and the type of light the object is placed in, a relational property of the object. It can be explained alone by the properties of the object and of the light in front of our eyes. The change of appearance has nothing to do with any properties of the perceiving mind.

A similar explanation can be given for perspectives. With the changing distance of an object to a certain location, the size of the object projected by the light to that location also changes. This changing size can be explained by the laws of projection from the object to the defined location. Whether the projected size appears as shadow on a wall, on the lense of a camera or on our retina, the projected size is submitted to the same laws of projection. And these laws have nothing to do with the properties of our mind. The way projected size varies in different conditions has nothing to do with specific properties of our mind.

Distortions in some media, as for example the fact that a stick looks bent in water, can also be explained by the properties of the stick and the properties of the medium alone. The stick looks bent to us, but it is also represented as bent on photo made by cameras. The fact that it looks bent depends on the projected shape in front of us, a property which can be detected by minds or cameras.

Perspectival properties and situation-dependent properties are relational properties which depend only on the intrinsic properties of the object and certain features of the situation. Usually, properties are defined in possible world semantics by a function from possible worlds to extension. The function gives for any possible world a specific extension, where all objects which instantiate the property are part of the extension. To define relational properties, one can say that the object instantiates the property *having-the-projected-size-S-relative-to-location-X*. In all possible worlds the objects which instantiate that property are picked out. Such a definition of relational properties can also be translated into a semantics of centered worlds (Brogaard 2011b). Here an object has the relational size property (having-the-projected-size-S) relative to a possible world with a time and a location marked as centers.

The important point for mind-independent relational properties is the fact that they can be defined without mentioning any properties of individuals having a mind. It is enough to just mention a location in order to attribute the relational property to the object. Whether that location is occupied by a mind, a camera or something else does not play a role in the attribution of the relational property.

That is different for *mind-dependent relational properties*. These properties depend not only on the intrinsic properties of the object and features of the situation, but also on specific properties of the mind. They can only be defined by a relation to the mind in general or a specific individual having certain psychological capacities. The attributed property must mention a mind instead of mentioning only a situational feature like a location, for example the property of *causing-the-size-appearance-S-relative-to-mind-X*.

If I look at a perfectly round plate from above and it looks oval or blurry to me, that is not explained by the perspectival property of the object. If I look at the plate from above, the light projects the round shape of the object in front of me as round, not as oval; and if there is no foggy air in front of me, the blurriness cannot be explained by situational features. If I see it oval or blurry, that must be explained by some distortions in my visual apparatus or some specific (malfunctioning) neural mechanisms. Now, we can say that the plate has the relational property to look oval and blurry to *me*, but it has that property only in relation to my specific (malfunctioning) perceptual system. The relational property depends on my mind. Contrary to perspectival properties, it is mind-dependent. These mind-dependent properties are subjective in the sense that they involve the specificities of a perceiving subject and cannot be defined by the objective features of situations.

How is the distinction between mind-dependent and mind-independent properties related to the traditional Lockean distinction between primary and secondary qualities? For Locke, qualities in general are powers of objects to cause certain ideas in our mind. Locke distinguishes between two types of ideas (Locke 1700/1975: Book II, chap. 8, § 8-16. For an interpretation of Locke´s distinction, see Eagle 2010). First, some ideas resemble some properties the object actually has. These properties are primary qualities (for example shape or "figure", solidity, number, extension) and they are intrinsic properties of objects. So, primary qualities can be identified with some of the intrinsic properties of objects as we discussed them in this chapter. Secondly, there are ideas which are caused by the objects but which do not resemble anything in the object. They do not represent anything of the object (given that representation is conceived by Locke as a relation of resemblance). The powers objects have to cause such ideas are their secondary qualities. The attribution of these

qualities depends alone on their effect in our mind, they depend on the experience we have. So, secondary qualities can be classified as mind-dependent relational properties in our sense. But how does the distinction between intrinsic, mind-independent and mind-dependent properties differ from Locke´s distinction between primary and secondary qualities?

Perspectival properties, situation-dependent properties and mind-independent relational properties introduce a category of properties which does not appear in Locke´s famous distinction. Locke thought that all ideas which vary with our relation to the object do not resemble anything in the object. They do not represent. Warmth increases and decreases with the relation to the object, therefore warmth cannot be a quality of the object. If warmth cannot be an intrinsic property (a primary quality), it must be a secondary quality. But the introduction of mind-independent relational properties opens other possibilities. Properties can be relational without being mind-dependent.

Secondary qualities are only one type of mind-dependent relational properties. For Locke, colors, sounds, tastes, coldness and warmth are examples of secondary qualities. But in our conception, also shapes can be mind-dependent relational properties. Shape can be an intrinsic property, as Locke conceives it, but also a mind-independent or mind-dependent relational property. The same shape (a bowed line) can be an intrinsic property of an object (a bowed stick), a mind-independent relational property (a stick deformed in a medium) or a mind-dependent relational property (the line in the Hering illusion). Contrary to Locke´s qualities, basic properties (like shape, size, color) represented by experience cannot be univocally classified into one of the Lockean property types.

A certain number of *perceptual illusions* can only be explained by mind-dependent relational properties. Let us take the Müller-Lyer illusion again. There are two lines of equal length in the Müller-Lyer figure. The projected length of the two lines on a plane in front of our eyes is the same length in both cases. The fact that one line has arrows at its ends, while the other line has inverted arrows at its end, does not influence the laws of projection of the line and therefore does not influence the projected size on a plane in front of us. The two lines are at the same distance from us and they have the same projection properties. Both lines have the same perspectival properties, the same *mind-independent* relational property concerning their size. Still, we see them as having different lengths. This difference can neither be explained by the length of the lines on the paper, nor by their perspectival properties. The difference must be explained by a *mind-dependent* relational property of the figure, a property which mentions the specific working of our mind or perceptual apparatus. The lines have the property to look different to *us*. Our mind happens to process equal lines differently,

depending on the configuration of the attached arrows. To attribute that mind-dependent property to the lines, we must mention, besides the intrinsic and situational features, our mind.

The most plausible explanation of the Müller-Lyer figure is that the length of the line and the different properties of the context (arrows versus inverted arrows) interact in our mind in such a way that the lines are seen as different. But the context (the arrows) do not cause any difference in the objective perspectival properties of the lines, they only cause such a difference in our mind. The different length of the lines is therefore a mind-dependent relational property. The Müller-Lyer figure differs from two equal lines at different distances. In such a figure the distance would explain a perspectival difference of the lines relative to location X; the perception of different length would be explained by mind-independent relational properties of the objects. In the Müller-Lyer figure the context only explains mind-dependent differences in the appearance of length.

An important difference between mind-independent relational properties and mind-dependent ones is that a perceptual experience of the Müller-Lyer figure cannot be explained by objective properties of the situation (object or situational features of the context). Because the second type of relational properties involves the reference to some mind, such properties cannot be considered as objective features of the situation alone. Given that relationalists want to explain all perceptual experience by some objective features of the perceived situation, such mind-dependent properties pose a serious problem for relationalism. If the phenomenal difference in perceptual illusions like the Müller-Lyer illusion involves such mind-dependent properties, as we claim, these illusions pose a serious problem to the relationalist program of an explanation of all phenomenal differences by objective differences of the perceived situation.

3.3. Types of illusions

With the distinction between intrinsic properties, mind-dependent and mind-independent relational properties we get a more detailed analysis of the two types of misrepresentation we defined at the beginning of this section (in 3.1). I distinguished above two forms of misrepresentation, misrepresentation by erroneous ascription of accurately perceived properties and misrepresentation of the components of content. The first form is a misrepresentation due to an erroneous ascription of a property to an object which does not instantiate that property. In this case, it was not necessary to suppose that the perceived property was a case of illusion. We can accurately see such a property but just ascribe it to an

object which actually does not have that property. This picture is now complicated by the fact that an object can instantiate a relational property, but we can erroneously ascribe that property to the object as an intrinsic property. We see for example a round object from a certain perspective where it looks oval and take it to be an oval object. We see an object in certain lightening conditions and attribute the properties the object has under these specific conditions as an intrinsic property to the object. We see a green car in a shadow and see it erroneously as a grey car. In these cases, we ascribe an intrinsic property to the perceived object which that object has only as a relational property. We take a shape under one perspective to be the object´s intrinsic shape. Or we take for example an illumination which gradually changes over the surface of an object to be a change in the intrinsic reflectance properties of the object. Changing situational features of the object are seen erroneously as constant properties of that object

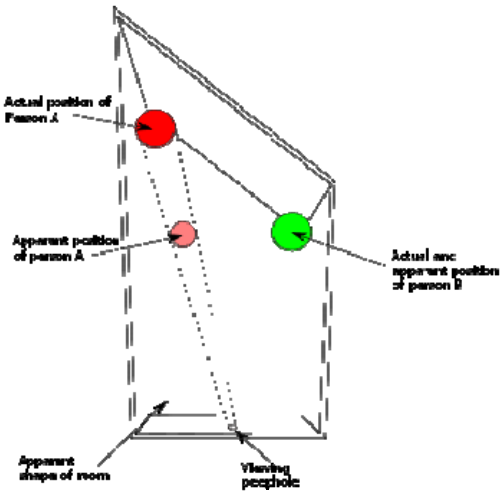
The second form of misrepresentation distinguished above was the failure to refer to specific properties of the object. The object has a property X and we misrepresent that property. Given the distinction between intrinsic and relational properties, it can be the case that only the intrinsic property of the perceived object is misrepresented, while we see correctly the mind-independent relational properties. Or both properties, intrinsic and relational, can be misrepresented.

Two fundamental types of illusions follow from this distinction. On the one hand a type of illusions where I see correctly the relational properties of the object, but where these relational properties are taken to be intrinsic properties of the object; on the other hand, illusions where the mind-independent relational properties themselves are misrepresented. And a misrepresentation of these relational properties leads to a misrepresentation of the intrinsic properties Both types are illusions, because the intrinsic properties of the object are not represented veridically.

In the *first kind of illusions*, we see the mind-independent relational properties of the object correctly. We see how the object appears under a specific perspective, under a specific illumination or under the specific conditions of a specific medium, for example in water or in a mirror. If we see for example a straight stick in the water as a bent stick, we see correctly how the shape of the stick is changed given the laws of refraction of light in that specific medium. Our perceptual experience would be wrong, if we did not see these specific refractions due to water. Other mechanical detectors of light equally register this specific distortion of the shape of the stick, as we can see in photographs of the stick in water. So, we do not misrepresent these relational properties of the stick given the specific medium it is

placed in. Austin (1962) argued for similar reasons that this often used example of a perceptual illusion actually is no illusion. It certainly is no illusion about the relational shape property of the stick. But the question whether we have here a case of illusion depends less on the way we see the refraction of the stick´s shape by light in water, but on the question how we see the intrinsic shape property of the stick. If the relational property of the stick is taken as its intrinsic shape, then we have a case of perceptual illusion, otherwise not.

A clearer case where the relational properties of an object are perceived as its intrinsic properties is the illusion of the Ames room. The psychologist Adalbert Ames constructed a strongly distorted room which looked from one point of view like a normal rectangular room (Ittelson 1952). Observers of the room could only look at it through a hole from one specific point of view. The room was distorted in such a way that the back wall was much closer to the observer on the right side than on the left side. But from the observation point it could not be seen that the back wall was receding away from the observer into the back. Two persons of approximately the same size were placed in the room, one on the farther left side of the back wall and one on the closer right side of that wall. The visual effect is that the person at the left looks much smaller than the person at the right. We perceive a small person and a much bigger person. Given that persons farther away look normally much smaller than persons which are nearer, we accurately see the perspectival size of the two persons, the size they look given the difference of distance. The relational size properties of the persons are perceived accurately. But because of the special construction of the Ames room, we do not see the difference of distance between the left side and the right side of the room. We therefore do not see the different distance of the two persons from us. The effect is that the perspectival, relational size is perceived as the actual, intrinsic size of the persons placed in the room.



Schematic representation of the Ames room.

The Ames room illusion.

The Ames room is a clear case where the relational properties of objects (or persons) are ascribed as intrinsic properties to these objects. We actually see some objective, situation-dependent and mind-independent properties of the scene before us. We do not misrepresent the relational properties (the relational size of the two persons) we look at. But the illusion derives from the fact that we take a difference in the relational properties of the persons observed for a difference in their intrinsic size, a difference in the constant properties of the seen persons. What is the difference to the example of the stick in the water? In the case of the Ames room, we do not represent correctly the situational feature which explains the difference in size: we do not see the difference in distance which explains why one person looks bigger than the other. If we did not see the situational feature which explains the distortion of the straight stick, i.e. the water, we would automatically misperceive the straight stick as intrinsically bent. If we would not perceive the difference of illumination falling on the wall, but only see the difference of shading on the wall, we would not be able to see that the wall is uniformly painted in the same color. We could not differentiate perceptual constancies from variable properties due to the situation. So, in these illusions, what we see can be explained by the objective, relational, but mind-independent features of the object and the situation.

The *second type of illusions* is different. In the second type, the illusion is due to an unveridical representation of the intrinsic and of the mind-independent perspectival and situational features, the mind-independent relational properties. In cases like the Müller-Lyer illusion, the difference in the size of the line is neither a difference of the intrinsic size of the line, nor of the perspectival size, the size of the line as it is projected in front of us, given the

laws of projection. The lines have the same intrinsic and also the same perspectival size. Here the objective size properties of the objects are misrepresented.

Major perceptual illusions described in perceptual psychology follow the same scheme: Other size illusions like the Ebbinghaus illusion, the Ponzo illusion or the corridor illusion, shape illusions like the Hering illusion, the Wundt illusion or the Orbison illusion,[83] motion illusions like Kitaoka´s "rotating snakes"[84] or color contrast illusions like the checkerboard illusion of Adelson all cannot be explained by the intrinsic or the mind-independent relational properties alone. We must add a description of the special processing mechanisms of our perceptual system to explain why a line is once seen as long and once as short (Müller-Lyer illusion, Ponzo illusion), once as concave and once as convexe (Hering and Wundt illusion), and why a square of the same shade is once seen as dark grey and once as light grey. The size, shape or color cannot be represented accurately in both cases of these parallel perceptual experiences. Our perceptual experience misrepresents at least on of the perceived properties of the perceived objects (lines, shapes, color patches). In the case of the Ames room and the stick in the water, we have clear situational features which explain the difference. The different perspectival size of the persons in the Ames room is explained by the different distances from the observation point. The different perspectival shape of a straight stick in the air and the straight stick in the water is explained by the medium and the different laws of refraction of light in these media. In the mentioned illusions of the second type, there are also differences between the context of the lines, shapes or color patches. But these differences do not influence the mind-independent relational properties like the perspectival size or shape. They only influence the mind-dependent processing of the perceptual or cognitive system.

The second type of illusions can further be differentiated in those where the perceptual system misrepresents the intrinsic or relational properties by *changing or distorting* them and into those where *features are added* beyond the objective properties of the object. Lines have a specific size, but perceptual processing changes that size (in the Müller-Lyer case), changes the shape (in the Hering and Wundt illusion) or the shade of the color (in Adelson's checkerboard illusion).

In other illusions, perceptual processing *adds* features to the intrinsic and mind-independent relational properties. The Hermann grid is a white grid laid over black squares.[85] At the white intersections of the grid appear grey spots in our visual experience although the

[83] See the illustrations on p. 193.
[84] See for that illusion http://www.psy.ritsumei.ac.jp/~akitaoka/rotsnakee.html
[85] For the Hermann grid, see illustration on p. 193.

intersections are of the same white than the rest of the grid. The grey spots are added by visual processing (actually by the inhibitory action of some retinal cells on other retinal cells. The inhibition makes the intersections look grey instead of white). In the Kanizsa triangle, we see three black circles.[86] In each circle white angles are cut out. These three angles are completed by visual processing into a complete white triangle which appears in our perceptual experience to be on the white paper, although only angles are indicated. Modal completion is another phenomenon where features are added to the objective properties of the drawing. The addition of features to the properties of objects seems to differ only gradually from phenomena such as after images, phenomena philosophers usually classify as hallucinations.[87] Both the perception of grey spots in the Hermann grid and the perception of after-images are explained by quite similar physiological processes, i.e. by the reduced sensitivity of certain retinal cells (either because of lateral inhibition in the case of the grey spots, or by lowered sensitivity due to the exposure to intense light and complementary higher sensitivity to the complementary colors in the case of the after images).

Both the changes of the intrinsic and relational properties and the additions to these properties pose a problem for a relationalist explanation of perceptual illusions. Relationalism wants to explain all perceptual phenomenology by some objective features of the perceived entities or of the perceived situation. Such an explanation of perceptual experience needs to recur to the mind-independent properties of the objects and situation. But the second type of perceptual illusions involves beyond these objective properties also specific properties of the perceptual processing of a given mind, mind-dependent relational properties.

Finally it is important to distinguish perceptual illusions from other forms of illusions which are not due to perceptual misrepresentation. Austin (1962: 50) gave the example of a lemon-like object made of soap. Here the illusion is not perceptual. Our perceptual experience represents an object and its properties: yellow, a specific shape and texture. And the object before us actually has these properties; it has this color, shape and texture. If only these basic properties are represented by the perceptual experience, then that perceptual representation is accurate. If we say that the kind property that this is a lemon is not represented by the experience, then the experience does not represent something which is not the case. Still we are deluded about something. We believe that there is a lemon and there is none. In this case the illlusion is not perceptual, but cognitive. We get a false belief about the object due to its

[86] For the Kanizsa triangle, see the illustration on p. 193.

[87] Philosophers usually call hallucination perceptual experiences where we perceive some properties although we do not see any corresponding objects. Psychologists call hallucinations pathological phenomena (hearing voices or seeing shapes or objects due to pathological psychological or neurophysiological conditions). After-images are clearly not pathological, but a common and unavoidable phenomenon of daily visual perception.

resemblance to a real lemon. The error lies in a false categorization, not in a false perceptual misrepresentation. Such *cognitive illusions* have to be distinguished from the *perceptual illusions* discussed above.

Similarly, we can have a *perceptual illusion* without a *cognitive illusion*. Knowing the effects of the Müller-Lyer, I stop to believe that the lines are unequally long. But the perceptual illusion persists. We *perceptually* represent the lines as unequal, but *doxastically* represent them as equal in length. We stop to be deceived by the illusion, at the level of our beliefs, although we continue to have a perceptual misrepresentation. Linear perspective in paintings since the Renaissance is a form of spatial illusion. Two-dimensional lines and surfaces appear to be three-dimensional. Although we persist to have the visual impression of three-dimensionality, nobody believes anymore that a space or room extends into the wall inside of the picture's frame. We have a perceptual illusion without a cognitive illusion. Our personal experience of perceptual illusions and our knowledge about it has the effect that we stop to believe into the perceptual illusion we continue to have.

4. Answering the Relationalist Challenge

In chapter 3,[88] I presented four arguments relationalists give for the rejection of a representational view of perceptual experience and the content view. I want to show in this final section how a representational view as developed above can counter these arguments.

(1) *The argument from science* uses the fact that the cognitive sciences increasingly question the explanation of perception by positing the construction of internal models and representations. And the cognitive sciences certainly use no philosophical theory of content similar to the theory of Russellian propositional content. But especially in the case of perceptual illusions, perceptual psychology postulates complex internal processing which can explain how often identical perceptual stimuli give rise to different perceptual experiences. The properties of the stimulus alone, be that the distal stimulus (the object) or the proximal stimulus in the retina cannot explain the way we experience our environment. Perceptual processing adds complex assumptions to the information received by external stimulation. On such a view of perception, as it is largely accepted by cognitive scientists, an explanation of perceptual experience by the objective features of the situation alone seems quite implausible. Especially for illusions, the "orthodox" representational view (Noë 2002) in the cognitive sciences is still the most probable. Psychologists like the Gibsonians, who contest that

[88] See section 1.2. of that chapter, p. 74-79.

"orthodox" view, insist that in our daily perceptual experience, we do not encounter the perceptual illusions psychologists discovered in their labs in the last 150 years. But even if illusions like the Müller-Lyer figure are not widespread in daily experience, the sense that our perceptual experience can go wrong and can deceive us is quite widespread. When we accept that our senses can deceive us, that poses no particular problem for intentionalism. But relationalism has to find a way to explain away the apparent fallible character of the senses.

For the first type of illusions we distinguished above, a relationalist can still appeal to the fact that our experience presents objective relational properties. It can be contested that by presenting these properties we also misrepresent intrinsic properties. A relationalist can say that we just see these relational properties and nothing else and these properties do not involve any error. But in the illusions of the second type, this appeal to objective properties seems much more difficult to defend. And in the explanation of these illusions the cognitive sciences clearly postulate internal representations which do not match with the properties of the stimuli.

(2) *The argument from particularity* claimed that only the acquaintance with singular objects can give meaning to our singular thoughts about particulars. But on the Russellian view of content, singular objects are represented in perception and enter into its content. Here again, this version of intentionalism has no disadvantage on this point when it is compared to relationalism. Our version of intentionalism has the advantage that it can accommodate particular content. But it has the further advantage that perceptual states can also be relations to general properties, an advantage relationalism does not have.

(3) *The argument from indeterminacy* is certainly the most challenging point against any theory of representational content. It says that we cannot determine in a precise way the content of perceptual experience. The perceptual experience can always be expressed by a multitude of propositions which attribute diverging contents to experience. Given that indeterminacy in the attribution of content, it is contestable that experience actually has content. Russellian propositions certainly attribute a precise content constituted by particular objects and properties. But the argument claims that there are no criteria to attribute one content rather than another to a given perceptual experience. Following the indeterminacy argument we could as well attribute some other Russellian propositional content to the same experience. To counter that argument, it is not sufficient to give a plausible theory of the structure and components of perceptual content, it is also necessary to give sufficient criteria which determine how this content and these components are attributed to a given perceptual experience. I proposed in the previous chapter a theory which gives sufficient criteria to

attribute Russellian content.

(4) Finally, *the phenomenological argument* for relationalism says that in our perceptual experience we are only aware of the external physical objects and their properties. It contests that we are aware of any representations or contents. But if the objects and their properties are components of the content as I defended in a Russellian view of perceptual content, then there is no phenomenal difference between the direct acquaintance with objects and properties as defended by relationalists and the relation to a content constituted by these same objects and properties. So, the phenomenological argument gives no advantage to relationalism compared to intentionalism when the perceptual content is defined as Russellian propositional content.

In the case of illusions which misrepresent the properties of the object by changing them or adding features to the actually instantiated properties (our illusions of the second type), the phenomenological argument gives an advantage to intentionalism. It can explain these changed and added features by represented properties which enter the content without being instantiated in the perceived situation. So, the Russellian version of intentionalism does not fare worse in explaining veridical perception, but has an advantage in the explanation of the phenomenology of illusion.

Conclusion

In defense of an intentional view of perceptual experience it is particularly important to give a plausible explanation of perceptual misrepresentation. Especially when confronted with relationalism, intentionalism has a theoretical framework more adapted to explain the phenomenology of illusion. In order to argue for that point I developed a theory of perceptual content and identified that content with a Russellian propositonal content. I argued that this content can capture the different aspects of perception and that it has furthermore the advantage to avoid the inconveniences relationalists attributed to intentionalism: a content as an intermediary between mental states and the external objects and their properties, and a representational relation which involves abstract entities. Russellian content permits a direct realism where the objects and properties are directly represented. I claimed that on such a view of content relationalism looses its major theoretical advantages over the content view of intentionalism. The application of the previously developed Russellian view to illusions emphasized the advantages of the content view over relationalism. I claimed that there is a central type of perceptual illusions which cannot be explained by relationalism, but which is

explainable by the properties represented by perceptual states having Russellian content.

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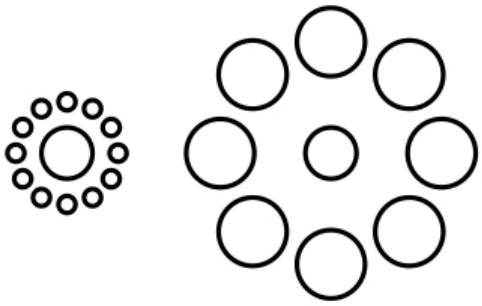
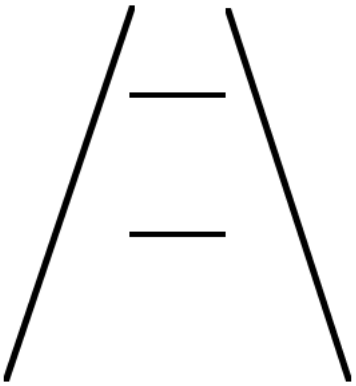
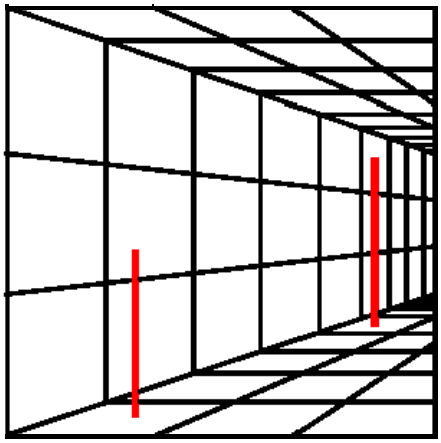
Illustrations



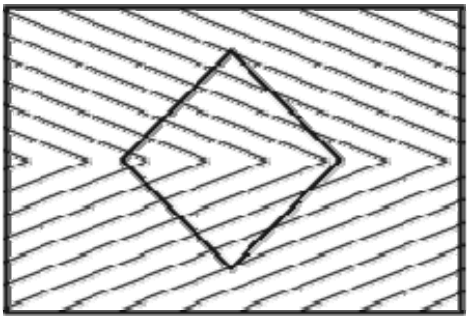
Ebbinghaus illusion



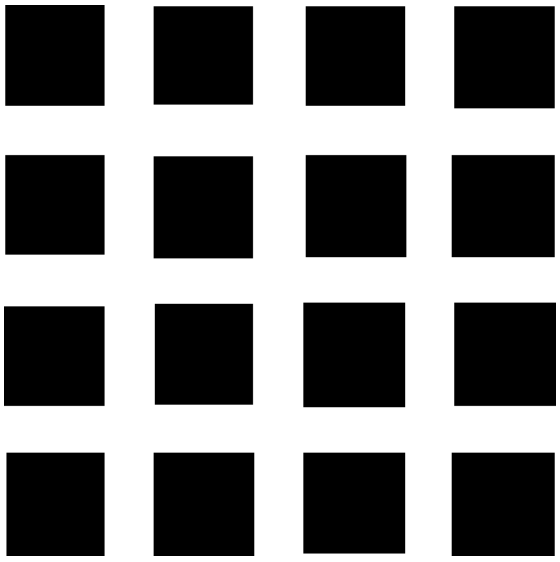
Ponzo illusion



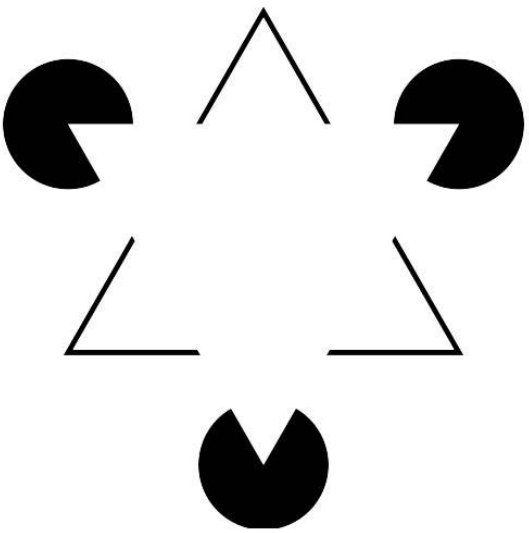
Corridor illusion



Orbison illusion



Hermann grid



Kanizsa triangle

Picture Credits:

Distorting lens, on p. 63: The picture of the effects of distorting lenses is taken from Kohler (1951: 36).

Adelson´s illusion, on p. 88: The picture comes from Edward H. Adelson´s homepage: http://persci.mit.edu/gallery/checkershadow

Ames Room, on p. 174: The picture of the Ames room is taken from: AUX SHUX A Web Magazine http://auxshux.com/the-ames-window

Abstract (English)

The central problem of the dissertation is the question whether our perceptual states have content. While debates about the nature of perceptual content have been common in the philosophy of perception, a recent discussion questioned whether perception has intentional content at all. Relationalism defends the view that perception is not a form of representation, that it cannot be accurate or inaccurate, that it does not have a content which would give to perception the ability to represent or misrepresent the world. Relationalism is a serious challenge for intentionalism, the view that perceptual states have intentional content and can be accurate or inaccurate. The present dissertation analyses the different aspects of this conflict between relationalism and intentionalism.

The central claim of the book is that the relationalist explanation of perception is insufficient and that a theory of intentional content for perception is needed in order to explain the different aspects of perceptual experience, especially perceptual illusions. Relationalism must reduce cases where we fail to see to cases of blindness, i.e. cases where we do not stand in an appropriate relation to a certain object or property, cases where we are blind to that object or property. It will be claimed that certain cases of illusions can be explained as such cases of a failure to see due to blindness. But other types of illusions cannot be treated in the same way. It will be claimed that we need the notion of inaccurate (or false) content to explain at least a certain type of common perceptual illusions. It will also be claimed that only intentionalism can give a coherent explanation of such illusions.

The critical part of the book against relationalism will be complemented by a positive defense of intentionalism and perceptual content. This second part of the book offers first a teleo-semantic account of the intentional content of perception. The view is defended here that the content of perceptual states depends on their causal relations *and* on the functions these states have for systems which use them. Finally, the nature of perceptual content is specified as a Russellian propositional content. The dissertation finishes with the claim that such a view of content counters the relationalist objections against intentional content. Perceptions can have content and can involve a direct relation to external objects and their properties.

Abstract (German)

Das zentrale Problem der Dissertation ist die Frage, ob Wahrnehmungszustände einen Inhalt besitzen. Diskussionen über die Natur des Inhalts von Wahrnehmungen sind seit langem allgegenwärtig in der Philosophie der Wahrnehmung, aber jüngst entstand eine Debatte darüber, ob Wahrnehmungen überhaupt einen intentionalen Inhalt haben. Der Relationalismus verteidigt die Sicht, dass Wahrnehmungen keine Repräsentationen sind. Sie können nicht zutreffend oder unzutreffend sein. Sie haben keinen Inhalt, einen Inhalt der ihnen die Eigenschaft verleihen würde, die Welt richtig oder falsch zu repräsentieren. Dieser Relationalismus stellt den Intentionalismus grundsätzlich in Frage, also die Ansicht dass Wahrnehmungszustände einen intentionalen Inhalt haben, dass sie zutreffend oder unzutreffend sein können. Die Dissertation analysiert die verschiedenen Aspekte dieses Konflikts zwischen Relationalismus und Intentionalismus.

Es ist die zentrale Behauptung der Dissertation, dass die relationalistische Erklärung der Wahrnehmung unzureichend ist. Eine Theorie des intentionalen Inhalts der Wahrnehmung ist notwendig, um die vielfältigen Aspekte der perzeptuellen Erfahrung erklären zu können, insbesondere Sinnestäuschungen. Der Relationalismus ist gezwungen, jene Fälle, in der die Wahrnehmung scheitert, auf Fälle von „Blindheit“ zurückzuführen, dass heißt auf Fälle in denen wir nicht in einer bestimmten Relation zu bestimmten Gegenständen und deren Eigenschaften stehen, auf Fälle also, wo wir gegenüber diesen Gegenständen und Eigenschaften blind sind. Einige Fälle von Wahrnehmungstäuschungen können tatsächlich auf diese Art des Scheiterns der Wahrnehmung reduziert werden, also auf Fälle wo wir gegenüber Gegenständen und deren Eigenschaften blind sind. Unser zentraler Kritikpunkt am Relationalismus ist, dass eine bestimmte Kategorie von Sinnestäuschungen so nicht erklärt werden kann. Zur Erklärung solcher geläufigen Sinnestäuschungen braucht man einen Begriff von unzutreffendem oder falschem Inhalt, einen Begriff von Fehlrepräsentation. Nur der Intentionalismus kann eine zufriedenstellende Erklärung solcher Sinnestäuschungen geben.

Dem ersten, kritischen und gegen den Relationalismus gerichteten Teil der Dissertation wird eine positive Verteidigung des Intentionalismus und des Wahrnehmungsinhalts gegenüber gestellt. Dieser zweite Teil des Buches entwickelt zuerst eine teleosemantische Theorie des intentionalen Inhalts der Wahrnehmung. Es wird darin die Sicht verteidigt, dass der Inhalt von Wahrnehmungszuständen von deren kausalen Relationen abhangt, *aber auch* von den Funktionen von Systemen, die diese Zustände verwenden. Abschließend wird der Inhalt der Wahrnehmung als ein Russell´scher propositionaler Inhalt

dargestellt. Die Dissertation argumentiert, dass so eine Auffassung von propositionalem Inhalt die relationalistischen Argumente gegen den intentionalen Inhalt der Wahrnehmung entkräftet. Wahrnehmung kann einen Inhalt haben und kann in einer direkten Relation zu externen Gegenständen und deren Eigenschaften stehen.

Curriculum Vitae

2012:	Research Assistant at the Institute Vienna Circle, University of Vienna
2009:	Semester at the Graduate School at the Department of Philosophy, Duke University
2006-12:	Graduate Student at the Department of Philosophy at the University of Vienna
2006-11:	Research Assistant in different research projects at the Institute Vienna Circle funded by the FWF ("Banishment and Return of the Philosophy of Science: Rudolf Carnap and Wolfgang Stegmüller" from 2006-7, "Moritz Schlick Edition" from 2007-9 and "History of Science and/or Philosophy of Science" from 2009-11)
2005:	Master in Philosophy with a master´s thesis on "The Concept of Action in the Philosophy of Charles S. Peirce", supervised by Ao. Prof. Ludwig Nagl
1993 :	Master in Political Sciences at the University of Sorbonne in Paris (Université Paris 1, Sorbonne).
1990-2 :	Guest Student at the "École des hautes études en sciences socials", Paris, in the courses of Cornélius Castoriadis and Jacques Derrida.
1991 :	Degree in Philosophy : "Licence de Philosophie" at the Sorbonne University, Paris (Université Paris 1, Sorbonne)
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