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The Trouble of Misrepresentation in Dretske's Information-Theoretic Account

Abstract

The 20th century has been the era for the rise and development of naturalist theories. With the combination of the linguistic turn and side-effects of the positivist approach, philosophers began to rethink and offer naturalist solutions to some of the chronic debates about the nature of language and mind. In *Knowledge and The Flow of Information*, Fred Dretske proposed a naturalist account for knowledge and representation. According to him, the information-theoretic account satisfies the requirements of naturalism in both epistemology and the philosophy of mind. Not only it does bring forth a new perspective, he believes that it also presents a new way of dealing with the problem of misrepresentation in the contemporary literature. In this work, first I will provide a brief presentation of Dretske's account of information and representation. Afterwards, I will present how he deals with the issue of misrepresentation. In the end, I will explain the reasons for the failures in his solution. In particular, I will argue for the claim that (i) not only his account fails to solve the problem of misrepresentation, (ii) but it also fails in one of the requirements of naturalism.

Keywords: Mind, Information, Meaning, Knowledge, Representation.

Dretske'nin Enformasyon-Kuramsal Açıklamasında Yanlış Temsil Sorunu

Öz

20. yy. doğalcı kuramların yükselişi ve gelişiminin çağı olmuştur. Dile dönüş hareketinin ve pozitivist yaklaşımın yan etkilerinin terkibiyle birlikte, felsefeciler dilin ve zihnin doğasına dair bazı kronik tartışmaları yeniden düşünüp doğalcı çözümler öne sürmeye başladılar. *Knowledge and the Flow of Information* kitabında, Fred Dretske bilgi ve temsil için doğalcı bir açıklama önermiştir. Ona göre, enformasyon-kuramsal açıklama hem epistemolojideki hem de zihin felsefesindeki doğalcılık şartlarını sağlar. Yeni bir perspektif getirmesinin yanı sıra, o bu perspektifin ayrıca çağdaş literatürdeki yanlış temsil sorununa da yeni bir çözüm yolu sunduğuna inanır. Bu çalışmada, öncelikle Dretske'nin enformasyon ve temsil kuramının kısa bir takdimini gerçekleştireceğim. Daha sonra, yanlış temsil sorununu nasıl ele aldığına değineceğim. Son olarak da onun çözümündeki kusurların nedenlerini açıklayacağım. Özellikle, (i) onun kuramının yanlış temsil sorununu çözemediğini, (ii) ayrıca doğalcılık akımının şartlarından birisini de sağlamadığını iddia edeceğim.

Anahtar Kelimeler: Zihin, Enformasyon, Anlam, Bilgi, Temsil.

In the middle of the 20th century, the naturalist projects in various fields of philosophy have been quite influential. Fred Dretske is one of the important figures in the middle and late 20th century history of philosophy, and his works fall under the naturalist camp. In his seminal work *Knowledge and The Flow of Information* (Dretske 1981), [1 , 2] Dretske proposed a new perspective that satisfies, according to his point of view, the requirements of naturalism in both epistemology and the philosophy of mind by supplying a powerful resource that can explain notions such as knowledge, belief and experience within the vocabulary of natural sciences. Not only it does bring forth a new perspective, it also presents a new way of dealing with the problem of misrepresentation in the contemporary literature. In this essay, first I will provide a brief presentation of Dretske's account of information and representation as it stands in his most influential book KFI. After laying out the basics of Dretske's account, I will present, in the second section, some of the chief troubles with his account and how he deals with these issues. In the end, I will explain the reasons for the failure in his solutions.

I. Dretske's Theory

The received common view argues for the claim that "something only *becomes* information when it is assigned a significance, interpreted as a sign, by some cognitive agent" (Dretske 1981: vii). Accordingly then, the very idea of information as something independent of interpreters was taken to be an absurd idea. Information must be in the head of the receiver much like the beauty is in the eye of beholder. Thus, there is no such thing as a flow of information between two events if there remains no intelligent life on earth to observe and interpret the relation of any two events as a sign of information.[3]

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[1] Italics in quotations are in the original text unless otherwise stated.
[2] Henceforward shortly as KFI.
[3] Cf. Daniel C. Dennett 1981: 109-126. In this article, Dennett deals with a very similar question whether representation is something that exists only when there is an intelligent being that can interpret and use that representation.

From Dretske's point of view, however, the received view is based on a common confusion of the idea of information with the idea of non-natural meaning. Information is a commodity that is quantifiable and objective, whereas non-natural meaning is not something that one can quantify over and it definitely requires subjects. Paul Grice (1957) makes a distinction between natural meaning and non-natural meaning. Non-natural meaning has to do with the language and semantics where a speaker's intentions are important to fix the content of his utterance. If a subject utters a sentence "I have the measles", then he typically intends to use this utterance in order to communicate what he thinks he has to the audience (Grice 1957: 383). Of course, one may mean that he has the measles but not really have them at all. In contrast, natural meaning is independent of language and intentions of a speaker. Think of the causal law-like relations between two types of events. Events of type A always cause events of type B. Whenever there are spots on somebody's face it is always because of the measles. Here, "those spots mean measles" is an instance of natural meaning. Moreover, if x naturally means y, then this indicates that there is a causal law-like relation between x and y, then y and x must be present.

In this context, Dretske believes that information must be distinguished from non-natural meaning in Grice's sense, and it must be associated with natural meaning. X's fingerprints on a glass of water at the crime scene naturally mean that X was present at the crime scene. They indicate or carry information about the presence of X at the crime scene. The number of rings on the trunk of a tree naturally means the age of the tree. It indicates or carries information about the age of the tree. This is the ordinary sense, or nuclear sense, of the term "information" from Dretske's point of view (Dretske 1981: 45).[4]

"In the beginning there was information. The word came later," (Dretske 1981: vii). From Dretske's point of view, information is an "objective commodity, something whose generation, transmission, and reception do not require or in any way presuppose interpretive processes" (Dretske 1981: vii). The project in KFI, in this context, is to

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[4] Dretske uses the term "indication" as the synonym for the term "information".

explain the transition from information to meaning that "was achieved by the developments of organisms with the capacity for selectively exploiting this information in order to survive and perpetuate their kind" (Dretske 1981: vii). So, the central task in KFI is to explain how meaning can evolve, how higher-order cognitive mechanisms can be seen as the development of lower-order information-processing mechanisms (Dretske 1981: vii; Dretske 1983: 55-63).[5] Dretske says:

> The higher-level accomplishments associated with intelligent life can then be seen as manifestations of progressively more efficient ways of handling and coding information. Meaning, and the constellation of mental attitudes that exhibit it, are manufactured products. The raw material is information. (Dretske 1981: vii)

Suffice it to say, then, the initial aim in KFI is to explain how meaning can be considered as the evolutionary product out of the raw material as information. Of course, this should not be thought as the easy task, because there seems to be an insurmountable gap between information and non-natural meaning. Information, as understood in the mathematical sense, is objective and quantifiable, whereas non-natural meaning is always understood within the context of a subject's mind-world relationships and the quantitative expression "amount of meaning" simply does not make sense (Dretske 1981: 42-43). The Communication Theory,[6] or interchangeably called as "The Mathematical Theory of Information", deals exclusively with the determination of the amount/quantity of information generated at the source of information and how much of this information is transmitted to the receiver (Dretske 1981: 3). For engineering purposes, calculation of the statistical averages about the flow of information between two points can be one of the important tasks, and CT helps engineers to design and create systems with effective capacities for handling and delivering information. Of course, here the important thing is about the amount of

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[5] By using the word "evolution", I want to emphasize that the difference between simple information-processing mechanisms such as TV sets, radios, etc., and complex information-bearing beings such as vervet monkeys, human beings, etc., is only a matter of degree from Dretske's point of view–this point will become more clear in the following pages. In this respect, Dretske and Dennett share the same view that, contrary to Brentano's view, there is not any principled difference between mental beings and physical beings. Cf. Daniel C. Dennett 1987: 237-268.

[6] Henceforward shortly as CT.

information, not its content. As for non-natural meaning, it simply does not make sense to investigate things like how much meaning is produced in two statements, how much meaning is carried between two people. We are simply interested in the content/meaning of statements, not sorts of things CT is interested in. So, given these difficulties, it appears that CT alone cannot explain the transition from informational measure to informational content/meaning.

CT is purely a quantitative theory meant to determine the amount of information generated at the source and how much of this information is received at other points (Dretske 1981: 3). It cannot tell you what information is encoded in a signal, but only provides how much information it carries. In the light of this observation, it is solidly evident that CT is very limited to help Dretske explain the evolution of meaning from the information-processing mechanisms and make good sense of Dretske's big naturalist project that mind is the biggest consumer of information (Dretske 2000: xi-xii). It is conceivable that a being/system might have had much more fruitful and richer resources to record various details of visual information compared to human beings' capacity to store visual experience and yet not able to manifest intelligence such as experience, belief and knowledge and thereby not go through a process of intellectual evolution at all.[7] In other words, it is not important for a being/system to have a capacity of great storage in order to instantiate intentional properties such as belief, experience and knowledge (Dretske 1981: vii). The important point is to explain how a relatively low-order information-processing mechanism can evolve into a more sophisticated and intelligent being. In order to explain this transition, one needs to explain the informational content, not the informational measure of a signal or state of affairs, and then move on to discussion of how this raw, messy and indeterminate informational content contributes to the evolution of intelligent beings. Dretske believes that if CT is

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[7] I take that one of the targets of Dretske's distinction between analog and digital information is to underline, albeit very implicitly, this conceivability point and explain the real reason for the evolution of information-processing mechanisms towards more sophisticated intelligent beings. I will leave the discussion of the significance of the distinction between analog and digital information to some other essay. I designed this conceivability statement after my readings of Dretske's book KFI and this is actually my interpretation of what he aims to do in this book.

supplemented with some further conditions and ideas, it can become a genuinely semantic theory that can help in semantic and cognitive research (Dretske 1981: x).[8] So, in a nutshell, Dretske's book KFI is an attempt to develop a philosophical theory of information explaining the semantic content of mental states without invoking intentional terms.[9]

After having laid down the principles and features of his theory, especially about the decisive line of demarcation between informational relationship and causal relationship on the one hand and the semantic conditions upon which a philosophically interesting theory of information is securely built on the other (Dretske 1981: 26-39; 63-82),[10] Dretske finally presents a theoretical definition of informational content:

"*Informational content*: A signal *r* carries the information that *s* is *F*= the conditional probability of *s*'s being *F*, given *r* (and *k*), is 1 (but, given *k* alone, less than 1)." (Dretske 1981: 65).[11]

First of all, this definition nicely captures the very idea behind CT. Any genuine communication supervenes on relevant objective relations that hold between two events. That is to say, if two events are lawfully related to each other, i.e., if there is a nomic regularity such that F-event is always followed by G-event, then it is clear that one can read off the information about F from the presence of G. Fingerprints of a person carry information about the presence of that person at the crime scene and can make him a strong suspect (given the background knowledge about his possible motivation to

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[8] Later on, Dretske found out that his view "information-based naturalization of knowledge and perception" was not enough. He believes that you cannot expect to naturalize epistemology without naturalizing the mind and we need to explain what belief and experience are in more details than the one briefly offered within the project in KFI. For this line of thinking, see Dretske 2000: ix-x.

[9] I owe great thanks to Fred I. Dretske for his comments on the earlier version of this paragraph.

[10] In the earlier drafts of this section, I was planning to make a room for the discussion of the difference between causal relationships and informational relationships as well as the discussion about the conditions for making a semantic theory out of CT. But then I realized that the whole enterprise is not practically feasible and I finally decided to leave that task out of the boundaries of this section. So, the reader is advised to turn to Dretske's KFI for the details.

[11] Take "k" as the background knowledge relative to the possibilities at the source. See also Dretske 1983: 58. Dretske's example: if I am playing chess and I receive the information that your knight is not on KB-3 (by some signal), then this signal could indicate to me that it's on KB-5 only if I already know that all the other possible positions that your knight could occupy are already occupied by other pieces.

commit a crime in that scene, etc.,); traces in the snow carry information about the species of living beings thereabouts; the dance of a honey bee indicates the presence of nectar-rich locations and sources.

Furthermore, the definition captures the ordinary sense of information that can be found in dictionaries where information is explained as something primarily and strictly related to intelligence, news, instruction and knowledge, each of which has been associated with the notion of truth (Dretske 1983: 57). For Dretske, information is such "an important epistemic commodity" that people "buy it, sell it, torture people to get it, and erect booths to dispense it" (Dretske 1983: 57). That's why the conditional probability of s's being F is equal to 1. In other words, no signal, event, or structure "can carry the information that *s* is *F* unless, in fact, *s* is *F*" (Dretske 1983: 57). In this framework, false information, misinformation and disinformation are not species of information just as a decoy duck is not a species of duck (Dretske 1983: 57).

In addition, the definition of informational content also leads us to the corollary, the "Xerox principle", according to which a signal's informational content cannot be ever unique (Dretske 1983: 57-58). Let us say that we have a signal transmitting a piece of information that s is F (say F=being a sphere) about a certain source of information. Let us also assume that there are objects at the relevant domain, i.e., at that source, which happen to instantiate G-properties (say G=being plastic). The Xerox Principle tells us that if there is a nomic regularity between F's and G's such that all F's are G's in that domain of objects, then any signal carrying the information that s is F necessarily carries the information that s is G as well.[12]

Above all, the definition gives us a clue to figure out intentional characteristics of physical beings ranging from the ones whose information-processing units are relatively primitive to the ones whose information-processing capacities are very sophisticated and resourceful. For instance, let us say my belief that this man is Susan's husband is

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[12] Dretske generally makes use of the following vivid example: the acoustic signal of a doorbell informs me that there is someone at the door, that the doorbell is being pressed, etc., provided that there is no short circuit between the doorbell and the doorbell button.

different from my belief that this man is my cousin. Unbeknown to me, Susan's husband could turn out to be my cousin, so it would be wrong to substitute the content of my belief "this man is Susan's husband" with the co-referentially equivalent expression "this man is my cousin" *salva veritate*. In the same manner, Dretske conceives, the information that this man is Susan's husband can be taken to be different from the information that this man is my cousin. It simply gives us different pieces of information about the same source. In this regard, unavailability of the substitution of one piece of informational content with a co-referentially equivalent piece of information could be the outcome of different channels of communication carrying different pieces of information about the same source (plus the lack of nomic regularity between those two pieces of information). This is such a big challenge to Brentano, because Dretske makes it clear that there is no principled distinction between mental beings and physical beings. To put it in different words, Dretske does not believe that we are different from voltmeters, thermometers, etc., with respect to this feature of intentionality (unavailability of substitution); because they occupy intentional states very much like human beings. According to him, we are only different from them with respect to our degree of intentionality, we are different from them in the way we store, process, encode and utilize the same piece of information (Dretske 1983: 58).

II. Problem of Misrepresentation

There are two big issues in Dretske's account that need to be resolved. In this section, I will explain Dretske's formulation and solution to the first problem.[13] First of all, it is typical of a belief that it does occasionally misrepresent how things stand in the external world. Our belief-structures are capable of misrepresenting the world around us, and this is one of the important features of our intentionality. Yet, according to the informational account, no structure can carry the information that s is F unless s is F; hence there is no room for misrepresentation in this account. Misrepresentation is one of

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[13] Due to the space limitations, I will leave the task of dealing with the second issue (i.e. the failure of substitution of co-referentially equivalent contents *salva veritate*) to some future paper.

the salient features of intentionality, and the informational account seems to fail in this respect.[14]

Let us now examine Dretske's treatment of the misrepresentation issue. According to his view, we should have a good comprehension about information-processing units and mechanisms, especially how they acquire information-carrying roles in a system of which they are a part. Consider maps. Let us say that there is a strict and steady convention among mapmakers such that blue ink means "water". Imagine that there are plenty of conventional agreements on how to use many other symbols. So, we have a good criterion upon which we can decide whether a given map is an accurate representation of a specific location. For instance, if one puts a blue ink on a certain region of the map and if there is no water in the place about which the map is to give information, then we have a case of misrepresentation, because blue ink, according to the common convention, acquires a particular information-carrying role and when it fails to perform that role, we will have a misrepresentation of certain facts about a certain location (Dretske 1983: 62).

Following this thread of thought, Dretske believes that one can think that information-bearing structures, for instance neural structures in human beings, acquire information-carrying roles during their development with experience and learning through which those structures *naturally*[15] develop a responsiveness to a particular kind of external stimuli carrying a definite piece of information. In this framework, mere

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[14] I haven't talked much about one of the big projects in KFI in details. In KFI, Dretske offers a new way of understanding mind and knowledge. For instance, instead of the traditional account of knowledge as "justified true belief", Dretske proposes a new account according to which knowledge is described as "information-produced belief" (See Dretske 1983: 55). In this whole framework, there are certain assumptions that play a key role in understanding the project in KFI. For instance, Dretske takes a person's beliefs as a certain kind of mental representations. Furthermore, Dretske's theory of informational content is supposed to explain the content expressed by belief-representations. These two points must be kept in mind, especially during his discussion of the problem of misrepresentation.

[15] According to Dretske, here we have a case of neural structures that do not acquire an information-carrying role by conventional assignment, but rather by natural development of structures during learning and experience. That's why I used italics here in order to emphasize this point. On this point, see Dretske 1983: 62. Although Dretske believes that he presents an account for natural representation as opposed to acquired/conventional representation, Fodor and Cummins particularly emphasize that his view can be used to explain only learned concepts and representations, so Fodor and Cummins believe that no account is actually given for mental/natural representations.

nomic covariation is not enough; we must introduce information-carrying functions of the receivers in order to give an account for the cases of misrepresentation between the receivers and sources of information.

Let's get into some technical details about Dretske's account here. In Grice's natural meaning, whenever we confront cases where X means Y, this "X means Y" entails Y. In Dretske's account of information, whenever there is an informational relationship between two types of events, say a thunder sound and the lightning channel that produced it, and since information is something capable of yielding knowledge and therefore requires truth, then this entails the truth about the existence of that lightning channel. Now, let us suppose that a subject has the sensory representation of the fact that s is F. There are great varieties of sensory representations in our experience of s, some of which are Fs and some of which are Gs, or in our experience of something else (say t), some of which are Fs and some of which are Gs. At this stage, we will perceive s, which is F, but not able to know whether s is F. According to Dretske, there is a digital-conversion unit that converts the incoming information in analog form into digital form by categorizing and classifying it under some selective method. Then, at the end of this process, we have a cognitive representation of the fact that s is F; we know that s is F. As a result, if our sensory and cognitive mechanisms are in perfect order, then we will have the belief-content that s is F. But, it is certainly true that we have also lots of false contents in our mind. We can misrepresent certain situations in the world. For instance, we can misrepresent a particular situation, where s is G or s does not even exist in that situation, and say that s is F.[16] Then, if there is nothing like misinformation/misindication as a kind of information/indication, then how can Dretske's account explain the cases of misrepresentation? It seems that as long as the sensory and cognitive mechanisms are operational and in order, then we will always have the correct content about things outside; yet even though there can be nothing

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[16] For Dretske, there are two kinds of misrepresentation. In the first kind, there is an object, but the object the system, say S, represents to be F, say blue, is not actually F, blue. In the second kind, S again represents something to be blue, but in fact there is no object that S represents to be blue. For an extensive discussion of these two kinds of misrepresentation, see especially Dretske 1995: 26-27.

wrong with our mind, we can still have false beliefs. Dretske aims to reduce semantic content, the content we have while believing, hoping, desiring, etc., to the informational content, and explain intentionality and intelligence via the informational account. But, without giving an account for the cases of misrepresentation, Dretske's project is doomed to fail.

In Dretske's account, there must be a nomic dependency between two types of events/states of affairs in order to establish a relation of information between these two points. The dance of a honeybee is informationally valuable for other members of the honeybee group because each dance of a honeybee is tokened when and only when there is nectar nearby. But, one may argue for the fact that it is still possible for some honeybees, due to extrinsic or intrinsic factors, to act out this ceremony about the nectar when there is really no nectar around. The dance of that honeybee will still have the content "there is nectar nearby" even though it is not tokened by the right cause.

Following the insight from conventional functions for determining representational content and misrepresentation, Dretske then claims that ontogenetic function acquisition and learning must be added to the causal story about mental representations. Let us focus again on concept acquisition. Suppose that there is a student, S, and his teacher helps him learn and correctly apply simple concepts such as the concept of robin, raven, bird, elephant, etc. S perceives objects such as robin, raven, elephant, dog, etc., and his teacher teaches him the correct concepts corresponding to objects in his visual field. The teacher also examines whether S really learns those concepts by examining whether he can employ them in the right circumstances. After the training period is over, S is given the license to use those concepts. He graduates from the school. It is still possible for S to use, in his box of concepts, a concept that is not triggered by the right cause, but only this time it will be regarded as wild tokening of that concept. Since S is, in the post-training period, a person who knows all about the concepts he has acquired, those tokenings accidentally triggering the concept are now counted as wild and will not sneak into the representational content of that concept. For instance, if the student in the post-training period mistakes a fox for a dog, then his

concept "dog" will not mean "dog or fox"; it will still mean/represent dogs. In a nutshell, Dretske makes a distinction between what happens in the training period and what happens afterwards, and by means of this distinction, he claims that wild tokenings of a concept can only occur after the student knows everything there is about that concept. Those wild tokenings are delicately differentiated from the normal tokenings of a concept. So, when a student, after the training period, utters a sentence "This is F" in the absence of the relevant object or in the presence of objects that are G, H, etc., but not F, this will be an instance for him to misrepresent facts. The problem of misrepresentation is solved and the case is closed, so says Dretske (Dretske 1983: 62).

However, there are serious difficulties in his solution. First of all, the training period example makes the assumption as if there is a very sharp, principled ground where the learning definitely comes to an end and the student has a full command of the concepts that he has learned in the training period. This seems to be a very incredible assumption. It is much more reasonable to hold a modest assumption that learning concepts is a lifetime activity (Cummins 1989: 68; Fodor 1992: 41).

Secondly, we should pay attention to the implicit assumptions in the example. The example implicitly appeals to many things such as the intentions of the teacher, going to school, use of the concepts in accordance with the conventions of the society, etc., things that violate the requirements of naturalism, according to which any mention of things like intentions, conventions, etc., must be avoided during the explanation of mind and representation. A quick look at the example, however, will bring all these things to the surface. During the training period, a subject is trained to use "X" as a mental representation of birds. Dretske says that when this student graduates from "X" teaching school, and mistakes an airplane for a bird, then we would say that airplane is not one of the normal causes for "X". So, whenever any airplane triggers "X", then we would say that it is false tokening of "X" and we have a case of misrepresentation. But, it is possible to interpret the same situation counterfactually. If any airplane can cause "X" in the post-training period, then it could have been true of that airplane to cause "X" in the training period as well. Just imagine one day before the graduation the student looks

at the sky; he sees an airplane and mistakes it for a bird. So, instead of saying that the student learnt "X" means bird, we can equally say that the student might have learnt "X" means airplane or bird. Then, when the student in the post-training period utters the word "X" in the presence of airplane, we should say that there is no misrepresentation; because he had previously learnt that "X" means airplane or bird. In Dretske's example, however, you can feel that the teacher's intentions, conventions of the society, schooling, etc., play a central role in determining how and why the student learns that "X" means bird rather than "X" means bird or airplane. So, when you emphasize, in the example, the role of the teacher, schooling, conventions of the society about the meaning of a concept, you may get around the problem at the cost of failure of the project of naturalism, which is not a good trade (Fodor 1992: 39-41; Adams & Aizawa 2010). Naturalism is one of the big goals in Dretske's theory, so I do not think that he will ever consider abandoning it seriously. In a nutshell, I believe that Dretske's story about learning is directly in conflict with his big project of naturalization.

Thirdly, and most importantly, telling a nice story about the occurrence of misrepresentation does not seem to help Dretske deal with the problem of giving an account for the possibility of misrepresentation. Personally, I think that the learning story is nice, and it just explains how misrepresentation can occur. But, I do not think that telling a story about the occurrence of misrepresentation can help overcome the difficulty with Dretske's account. Dretske's account straightforwardly implies that if a signal carries the information that s is F then s really is F. So, on this account, when my mental state represents that s is F, then it must be the case that s is really F. There is no way my mental state can misrepresent a certain situation. Dretske's theory already rules out misrepresentation, and it just does not help a bit to tell a story how misrepresentation can occur. Saying something about how misrepresentation can occur and solving the problem of misrepresentation in the theory are two different things.[17]

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[17] I owe this point to Professor Stephen Voss.

In this essay, my primary goal was to understand and present Dretske's informational account of representation as it was first advertised in KFI.[18] I began with his technical formulation of the concept of information. In the end of this essay, I talked about one of the important problems in his account and how he deals with the issue. It seems to me that Dretske's solution to the problem of misrepresentation does not really work at all. Although he fails to solve the problem in his account, we can still learn a few lessons from Dretske's account: mere nomic correlation between the receiver (mind) and the source (world) is really not enough to ground a representation-relationship. This should be taken into a serious consideration when dealing with the nature of representation.[19]

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[18] The informational account has always been present in Dretske's works; however, later on in his career he added a teleosemantic component to this informational account. Cf. Dretske 1988, Dretske 1995.

[19] I had the opportunity to meet Dretske on the occasion of his seminar at Boğaziçi University in 2006. During the writing process of this work, I contacted him and asked a few questions about his theory in KFI. He helped me understand his theory much better than before. So, special thanks go to this generous and good human being, who passed away in 2013.

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