IS INFORMATION ‘PERSPECTIVAL’?

The consequences of Floridi’s notion of *level of abstraction* for the philosophical conception of *data* and *information*

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"But do not ask absolute questions,
for they just create an absolute mess."

(Floridi, 2008b, p. 32)

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Abstract

Luciano Floridi has developed a notion of semantic information as well-formed, meaningful and veridical data. He combines this data-based definition with an "epistemological levelism", an approach that thinks of *levels of abstraction* as making possible an analysis or description of a system by predetermining the kind and amount of data that can be extracted from the system, specifying both the features that are recorded and the way it is recorded. It is showed that, under influence of this levelism, Floridi's notions of data and information actually are perspectival in the sense of Ronald Giere's "Scientific Perspectivism". The most important conclusion however is that, given his epistemological levelism, Floridi's data-based definition of information is not tenable as a philosophical conceptualization of information. This conclusion has profound consequences for analyses within the field of the philosophy of information and for the debate about the conceptualization of information. As an option for this debate, a systematic perspectivism – to be developed along the lines of Floridi's levelism – is sketched. Although a lot of work has to be done, this option seems to be promising and capable of withstanding the objections often raised against perspectivism (and relativism) and therefore must be taken serious in the debate.

Introduction

The relevance of information as a philosophical notion

As it is often put, we live in the so-called "information age". Never before was information so readily accessible as in our current times. The development responsible for this (the information revolution) has a profound impact on the way we live our lives, and yet, it is only relatively recently that philosophers pay explicit attention to philosophical questions concerning information. There are several philosophers that played a crucial role for the philosophy of information (for instance Wiener, Turing, Simon and Dretske). But in our current days, there is one prominent philosopher that brings us a systematic philosophical treatment of information, and that is Luciano Floridi, who is also recognized as one of the most prominent philosopher on information.[1] Floridi launches the philosophy of information as a separate field, standing next to, for instance, epistemology, ontology etc. (Floridi, 2004b) An important idea he supports is that information is a fundamental notion that deserves a systematic treatment on its own.

In order to analyze developments like the information revolution but also to further establish the field of the philosophy of information, we need a philosophical account of the question what information is. Such an account and, additionally, an account of the relation between information and knowledge are also crucial if the notion of information is to shed a new light on long lasting central philosophical issues like those of knowledge and truth.

However, there is quite some disagreement about what information actually amounts to. There are many definitions of information, often aimed on a specific field of research or application. (Floridi, 2005a) (Shannon, 1993). Many of those definitions originate in more or less technical fields like cybernetics or computer science and may not have been fully exposed to philosophical arguments. So although a philosophical conception of information seems very relevant, it definitely is work in progress.

[1] See for instance (Bynum, 2010)

The standard definition as a starting point

Despite the abundance of notions of information, there is a natural starting point for an investigation of the question how to conceptualize information philosophically. For there is a standard definition of information (or *semantic* information), which, for instance, many information technology students in the Netherlands can reproduce by head when asked for it. That definition is that "information is meaningful data" (or, to be a little more precise, well-formed and meaningful data). Floridi also takes this definition as a starting point for his attempt to develop a philosophically fruitful concept of (semantic) information.

When we couple the widespread "standard definition" of knowledge (justified true belief) to that of information we can create a (preliminary) overview of these notions and their relations.

- If *data* is well-formed and meaningful we get *semantic information*
- If semantic information is true, we get *veridical semantic information*
- If veridical information is justified, we get *knowledge*[2]

Being well-formed means being in accordance with syntactic rules. Meaningful can for now be understood as having or knowing the truth conditions, without knowing if these hold. If this is known also, semantic information is considered true. Justified means having (valid) arguments for holding true. All these descriptions must be considered preliminary. This paper is dedicated to the discussion and refinement of these rough descriptions or definitions of these notions.

Obviously, since all of the crucial notions are based on a notion of data, they require a definition of data. One may understand data to be a (potential) representation or string or sign. Or one can think of data as that which is considered to be some (but not yet interpreted) fact about something. Floridi argues that the essential character of data is diaphoric. His point

[2] The idea that this is not enough is widespread; see for instance (Gettier, 1963). Please keep in mind that these characterizations are preliminary.

is that data is reducible to a difference or lack of uniformity. Therefore, he considers data to be a – to be interpreted – (set of) distinction(s).[3]

The central issue

Now the point is that, as Floridi concludes, data always involves a certain *level of abstraction*. (Floridi, 2008a, p. 5) Floridi speaks of the level of abstraction as predetermining the kind and amount of data and information that can be "extracted" from the system under examination. (Floridi, 2008b, pp. 18-19) This implies that he thinks of data as being strictly related to (or created by) the application of the level of abstraction.[4] If, for instance, a piece of data or information is to hold some content about color (that something is red or blue for instance), the level of abstraction at which this content is to be hold must enable discrimination between the colors red and blue in the first place. If a level of abstraction is applied that is not sensitive to the difference between red and blue, zero data about this color difference can be captured. Thus the level of abstraction can be considered to function as criteria of discrimination that make possible the extraction of the distinctions that constitute data. Floridi understands data (and the information, models and analysis based on it) as being made possible by the level of abstraction. (Floridi, 2008b, p. 24) The notion level of abstraction is an epistemological notion. For it relates the data (understood as potential representation, sign or string), to the issue of how the data can be about the things they are taken to be about.

Floridi calls this view a form of *epistemological levelism*. And this view may remind us of forms of perspectivism, for it seems to share the same theoretical structure. In perspectivism, observations or theories or information in general also are made possible, not by the level of abstraction but by the associated perspective, and, just like different levels of abstraction "extract" different kinds and amounts of data from the system under examination, different perspectives "extract" different observations, theories or information from the world.

[3] A more detailed description and discussion of Floridi's notion of data will be provided in the remainder of the paper.

[4] Although the notion *abstraction* often is associated with non-concreteness, the notion *level of abstraction* should not be associated with non-concreteness, for certain levels of abstraction lead to very concrete or detailed data.

Therefore, Floridi's claim that data and information are "levelistic" raises the question if this means that his notions of data and information are perspectival as well.

Floridi, however, does not present his view as a form of perspectivism. On the contrary, in some cases he associates perspectivism with a misguided form of relativism. (Floridi, 2008b, p. 32) Therefore, we have to be careful in interpreting Floridi's thinking as being a form of perspectivism. So instead of looking for a "fully relativistic" perspectivism which holds that each perspective is as good as any other, we investigate the claim if Floridi's levelism does not make information perspectival after all.[5] This would be an interesting finding in itself, for if we might have to conclude that data and information are perspectival, this could have major consequences for a philosophical account of information. For this affects not only the understanding of the notion information itself, but also the issue of the truthfulness of information and the discussion about the scope of the field of the philosophy of information. It might have consequences concerning the "nature of knowledge" as well. Therefore, notwithstanding Floridi's wariness towards perspectivism, the question whether his notions of data and information are perspectival will be at the heart this paper.

Veridical information, correctness and truth

An important aspect of Floridi's view on semantic information is that it is veridical in nature. It is not immediately clear how the veridicality of information could be combined with, for instance, the emphasis on levels of abstraction for constituting data. To account for this, Floridi advances his *Correctness Theory of Truth* of semantic information. This theory is also of importance for an interpretation of the relation between veridical information and knowledge and also for our question regarding the perspectivity of information. Therefore, it will be discussed later in the paper.

Giere's Scientific Perspectivism

In order to accomplish an inquiry after these issues, we need a clear account of what it means for data and information to be perspectival. Such an account may be derived from a

[5] For a comprehensive overview of the many forms of relativism including perspectivism please see (Baghramian, 2004) and (Swoyer, 2008)

contemporary perspectivism that is developed in the more systematic part of academic philosophy. By systematic I mean in this context a consistent version of perspectivism that is intended as a positive theory (rather than as a mere provocation or disregard of our scientific and theoretical accomplishments) and that at least passes the self-refutation argument as for instance brought forward in *Nietzsches Perspectivism.* (Hales & Welshon, 2000) It would help if such an account can address some lasts century insights in fields like the philosophy of science. So although Nietzsche's perspectivism is one of the best known, it does not fit these needs best. Luckily, Ronald Giere's work on (scientific) representation and scientific perspectivism happens to be well suited for our purpose.

The main claim Giere makes in *Scientific Perspectivism* is that all scientific knowledge, observation and theories are perspectival.[6] Illustrating various examples of perspectivity in science, Giere advances a general argument that shows that scientific knowledge is perspectival. (Giere, 2006, p. 96) His version of perspectivism is meant as a positive contribution to advance the debate in (analytic) philosophy. Further, Giere's perspectivism is detailed and consistent enough to be analyzed in a number of aspects of perspectivity. Therefore, it is particularly suitable to use as our guide to make explicit what it means for knowledge or information to be perspectival. This makes it possible to investigate the question if Floridi's definition of data and of information must be understood to be perspectival.

Obviously, Giere's perspectivism of scientific knowledge is epistemological in nature, while an account of information not necessarily is. Even though Floridi's levelism is epistemological – reducing chances that this may become a serious problem – it will be prudent to choose a method of comparison such that this potential issue is accounted for. This will be taken into consideration in the approach.

Research questions

In light of the above, the next questions are relevant and will be discussed.

[6] Although Giere does not explicitly put it that way, his central claim can easily be read as meaning that all scientific information is perspectival.

- What are the consequences for Floridi's definitions of data and information given his notion of *level of abstraction*? Are data and information perspectival in the sense of Giere's perspectivism?[7] Does this mean Floridi's levelism effectively is a form of perspectivism?
- What are the consequences of Floridi's veridicality thesis and his *Correctness Theory of Truth* of semantic information for how we must conceive of data and information?
- What is the difference between veridical information and knowledge? Must veridical information, like knowledge, be understood as normative in nature, requiring justification? Or can it be hold to be neutral with respect to such epistemological questions?
- Do the answers to the questions above have any consequences for the suitability of Floridi's notion of semantic information as a fundamental concept for the philosophical field of information?

Approach

To be able to handle the complexity and the interdependence of the issues to be addressed in this paper, they will be approached step by step. Giere's perspectivism, for instance, will be analyzed in several aspects of perspectivity, so that, one aspect at a time, Floridi's notions of data and information can be inspected with respect to their perspectivity. This approach also makes it possible to conduct a detailed comparison, without running into problems because of possible differences between the nature of Floridi's levelism and that of Giere's perspectivism.

For comparable reasons, I will start to discuss semantic information in detail, without adding the extra qualification of veridicality. Even though the veridicality thesis is crucial for Floridi, the consequences of this extra qualification will be discussed only after we have thoroughly discussed "standard" semantic information and its perspectival elements. This is a good thing to do because the standard definition is important on its own, but also because it is both practical and a good practice to try not to do everything at the same time, so that it can be

[7] As advanced by Ronald Giere in his book "Scientific Perspectivism". (Giere, 2006)

tracked what issues are solved or introduced at what step. Third and most important, in case semantic information may prove to convey significant perspectival components, these may influence the veridicality issue (or how it is to be discussed) itself.

For similar reasons, the question about the relation between information and knowledge will be discussed only after the questions about veridicality and correctness of information are examined in detail.

The structure of the paper

The above remarks about the approach result in a structure of the paper as represented below.

First, the term and the notion information will be situated in its historical context. Since the notion became popular mainly as a result of developments in computer technology, the philosophical relevance is not immediately evident and will be made apparent.

Then the standard definition of information as formulated by Floridi will be explained. Since it is based on data, Floridi's *Diaphoric Definition of Data* will be discussed in detail. Floridi's notion *level of abstraction* is crucial for his conception of data and information, and hence for our discussion. Therefore, it will be explained as well. Additionally, a necessary clarification regarding Floridi's notion of data will be made.

To be able to examine the question if Floridi's notions of data and information are perspectival, Giere's perspectivism will be discussed. It will be analyzed in a number of aspects of perspectivity to account for the question what it means if something (like knowledge or information) is perspectival.

Next, we walk through these aspects one by one to examine if Floridi's notions of data and information are perspectival in Giere's sense. Conclusions will be drawn per aspect and the results will be briefly discussed.

Then the discussion will be brought to the next level by introducing Floridi's veridicality thesis. His implementation of it is described in his correctness theory of truth, which will be explained. Next, the consequences of this conception of veridical information will be discussed, including the question if it is to be considered perspectival.

In the next chapter it will be discussed in what respects this notion of veridical information is still different from knowledge. This issue will be discussed briefly using both Floridi's correctness theory of truth and his network theory of account.

In the discussion, the findings are summarized. They make possible a reinterpretation of Floridi's notions of data and information, which is given. The crucial importance of the level of abstraction allows for a fundamental critique on the "standard" data-based approach to information. In the wake of this, a reorientation on the founding notion of the philosophy of information will be advocated. Both the problems and the possibilities of such a revised approach will be discussed.

Information

The historical context of the term

History of the term: etymology

Information is a concept with various meanings and fields of application. Floridi writes:

> "Information is notoriously a polymorphic phenomenon and a polysemantic concept so, as an explicandum, it can be associated with several explanations, depending on the level of abstraction adopted and the cluster of requirements and desiderata orientating a theory." (Floridi, 2005a)

In such a situation it is best to start with a short look at the history of the notion and the term itself. The English word seem to be derived from the Latin verb *informare* (to inform) in the sense of "to give form to the mind", "to discipline", "instruct", "teach". It is not clear if the Latin word *informatio* (meaning concept or idea) has influenced the development of the word information in English.

> "Information" is one of those crucial concepts whose technical meaning we have not inherited or even adapted from ancient philosophy or theology. It is not a Greek word, and the Latin term happens to have a different meaning, largely unrelated to the way we understand information nowadays. (Floridi, 2007, p. 32)

History of the notion and its use

The philosophical interest in the notion only got started quite recently; it arose in the wake of the developments that gave rise to the information age. To be able to situate the growing interest, these developments will be sketched first.

Alan Turing begun publishing his well-known papers in the 1930s. A few decades later, Claude Shannon is the next hallmark, with his information theory, *A Mathematical Theory of*

Communication published in 1948.[8] In the same year, Norbert Wiener published his book on Cybernetics (the science of information feedback systems). At that moment he was already aware of the challenges of the coming "information age" as he called it in great foresight. (Bynum, 2005, p. 11) The field of Artificial Intelligence (AI) research was founded at a conference in 1956.

These fields, computer science and ICT sometimes attracted some interest from the philosophical community, but only sporadic. (Floridi, 2002, p. 125) According to Floridi, until the mid-1980s, the philosophy of these fields (including the philosophy of AI) should be considered premature. The computational turn affected science much more rapidly than it did philosophy.

History of philosophical interest in the concept 'information'

According to Floridi, in the mid-1980-s the philosophy of the aforementioned fields (like AI, computer science and the like) matured considerably. He claims that by that time, philosophers had become fully aware and appreciative of the importance of the topics of these fields, the value of their methodologies and theories. (Floridi, 2002, p. 128) That being said, in the years of studying philosophy at the University of Amsterdam, I haven't heard a single (associate) professor teach about information as a subject on its own.[9] So this appreciation might have been put a little too strong by Floridi. It's philosophy of language and logic that seems to dominate the discourse, not philosophy of information. However, because of the ever growing importance of ICT, I think Floridi is right that there can be no doubt that the philosophical interest will finally grow.

Information age as synonymous to history

Some speak of the "information age" from the invention of the telegraph and the telephone, but normally only the last few decades are meant. Even though the philosophy of information

[8] Information theory is actually a mathematical theory of data communication, and certainly not a (philosophical) theory about information.

[9] The term "information state" obviously did occur and is important in the context of Dynamic Predicate Logic and update semantics. But even there, information was not treated as a subject on its own.

has evolved relatively slowly, there is a sense in which information is very old. For one can argue that the information age started with the beginning of history. Floridi puts it as follows: *"No records, no history, so history is actually synonymous with the information age, since prehistory is that age in human development that precedes the availability of recording systems."* (Floridi, 2010a, p. 3) In this sense, Floridi continues, *"humanity has been living in various kinds of information societies at least since the bronze age."*

So Floridi contends that information is not something newly discovered that is to be related only to the development of computing and ICT. Analyzing systems or processes in terms of information, however, is relatively new. And if we do that when we look at our ancestors, we see them exchange information as we do, although at a different rate, using only very basic "technologies" and in societies much less dependent on informational systems than ours.

The philosophical relevance of the notion

There are several reasons why information is relevant philosophically. First, information is the core factor in the information revolution. No one can deny the impact and importance of this development for the way in which we live, communicate and work. Capturing systems or processes in informational terms and readily providing and exchanging information, as it is relevant for the user, has proven to be extraordinary powerful. If we are to understand what is involved in this development, we must have a notion of what information is or amounts to.

Within this context of associating information with the developments in computing, there are many possibilities for philosophically interesting issues in which conceptual analysis (as our main philosophical method) might play a role. Floridi articulates several of such issues in his article *Open Problems in the Philosophy of Information*. (Floridi, 2004b) As an illustration, I will mention a few of such issues here: *How can data acquire their meaning? Can an informational approach solve the mind-body problem? Can nature be informationalized? Does computer ethics have a philosophical foundation?*[10] These questions are all philosophically relevant questions that arose in the wake of the information revolution.

[10] For more details and an explanation of these issues, please see (Floridi, 2004b, pp. 568-575).

Another reason why information is relevant philosophically is connected to the fact that history is in a sense synonymous to information. History (in the sense of our written or recorded past) is by definition made possible by recording what happened, by describing things or take note of impressions; or as we now might say, by purposely using information.

It might be so that the information revolution is only recognized as a significant development since the abundance and proliferation of digital information. But, it could be argued, the digitalization only made things we already could (at least in principle), much easier and quicker. The more fundamental step was the invention of writing and the digital revolution "only" took that (with its associated achievements) to the next level. This line of reasoning suggests at least that important aspects of the concept of information must be associated not with computer science, but with communication and recording. This also suggests that information is a very fundamental notion. The "computer revolution" itself is influential enough to justify systematic philosophical attention to information; but information seems to go way beyond that. For it is relevant to our understanding of what happens when we communicate, record observations or interpret something.

Obviously, in the history of Western philosophy, great effort is spent to understand all these sorts of processes; the issues regarding knowledge, justification and truth are discussed extensively in philosophy. Interestingly, the "thing" considered to be true or to be justified, the "belief", was less focused on. And if we want to understand the most basic aspects of what it takes to record or communicate, even the term belief still seems rather complex and rich. For it is (easily) loaded with associations like subjectivity, human capabilities or being prone to error etc. More "neutral" notions like data and information (taken as such, regardless of their justification) might provide a better starting point.

The point is, as for instance analytic philosophers like Gareth Evans and Michael Dummett suggest, that information seems to be more fundamental then for instance knowledge. Dummett makes this point, referring to Evans, in the following way.

> "Evans had the idea that there is a much cruder and more fundamental concept than that of knowledge on which philosophers have concentrated so much, namely the concept of information. Information is conveyed by perception, and retained by memory, though also transmitted by means of language. One needs to concentrate on that concept before

> one approaches that of knowledge in the proper sense. Information is acquired, for example, without one's necessarily having a grasp of the proposition which embodies it; the flow of information operates at a much more basic level than the acquisition and transmission of knowledge." (Dummett, 1993, p. 186)

The core idea acknowledged here is that information is more fundamental than knowledge and that it should be analyzed before we try to understand what knowledge amounts to. Unsurprisingly, Floridi also considers information (at least) as fundamental as knowledge:

> "Information has thus arisen as a concept as fundamental and important as being, knowledge, life, intelligence, meaning, and good and evil – all pivotal concepts with which it is interdependent – and so equally worthy of autonomous investigation." (Floridi, 2002, p. 141)

The points made above make clear that the notion of information is most relevant philosophically. Because it is, Floridi introduces the philosophy of information as the forthcoming *philosophia prima*, and he believes that it promises to be one of the most exciting and fruitful areas of philosophical research of our time. (Floridi, 2002, p. 141) He sometimes refers to it as the "informational turn". (Floridi, 2004b, p. 571)

The Standard Definition of Information (SDI)

Now we know that information matters, it is time to zoom in on how to conceptualize it. Just to get an impression of the variety of notions of information that are used, I will name a few of them (without trying to provide a full explanation of them):

- Information is any kind of event that affects the state of a dynamical system; something contains information about its environment if it is in some state that it wouldn't be in if the environment weren't a certain way. (Stalnaker, 1998)[11]
- Information is a difference that makes a difference. (Bateson, 1979, p. 99) Thus information is about a lack of uniformity (in the world) that is of importance for the interpreter.[12]

[11] This is described in terms of events, because such an analysis is done primarily in terms of the changes of a dynamic system.

- Information is that which adds knowledge or definiteness and therefore is capable to reduce uncertainty or indefiniteness. This is a more general formulation for information in the sense of Shannon's information theory. For this theory, information is only a selection of one symbol from a set of possible symbols.[13] (Shannon & Weaver, 1949)
- Information is that what could become knowledge if it is justified and true. (Dunn, 2008)

Floridi – trying to summarize the abundance of conceptions – remarks that semantic information generally is understood to be "content about a referent". (Floridi, 2010b, p. 3) According to the *Standard Definition of Information* (SDI) it is well-formed and meaningful data.

The scope of SDI

Before unfolding the standard definition of information, it must be made clear what is not meant to be fully covered by it, even though it may be strongly related. For instance information in the sense of Shannon's information theory is not considered to be *semantic* information, for information theory is actually about data communication rather than about meaningful information. The definition of information as "any kind of event that affects the state of a dynamical system", may also not be fully covered by the standard definition. For this definition may include non-semantic information like environmental information.

Environmental information can be natural, as in the example of the concentric rings visible in the wood of a cut tree, by which the age can be estimated. But it is not necessarily natural. The point is that environmental information may not involve semantics of an intelligent producer or informer. It can be seen as information that is unintentional[14]. Also plants or lower animals are capable of taking advantage of environmental information. Environmental

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[12] Floridi's notion of data is based on this idea that information is about a lack of uniformity.

[13] See for instance (Floridi, 2005a) for an explanation.

[14] As far as I found, Floridi does not use this term to describe environmental information. I still chose it for it seems to be the most comprehensive way to characterize the notion.

information is defined relative to an observer (an information agent), but there is no intentionality in the creation of it. So it is not considered to be semantic information as well.[15]

SDI: the standard definition of (semantic) information

As being said, according to the "standard definition", semantic information is well-formed and meaningful data. This is also the simple core of SDI and, according to Floridi, this definition is the operational standard, at least in fields that treat data and information as reified entities. SDI can be formulated as a tripartite definition: (Floridi, 2005b, p. 353)

(SDI) σ is an instance of information, understood as semantic content, if and only if:

(SDI.1) σ consists of one or more data;

(SDI.2) the data in σ are well-formed;

(SDI.3) the well-formed data in σ are meaningful.

SDI.1 states that information is made of data. So obviously, SDI requires a definition of data. Therefore Floridi's definition of data will be discussed in detail in the following sections. Before that, a few things can be made clear already.

In (SDI.2), "well-formed" means that the data are clustered together correctly, according to the syntax that govern the chosen system, code or language being analyzed. Syntax can, but need not be linguistical (in the strict sense). It must be understood as that which determines the form, construction, composition or structuring of something.

In (Floridi, 2005b) Floridi does not define what the meaningfulness in (SDI.3) exactly amounts to, but the common view is that the data also is interpreted, in the sense that the referent is being resolved; the truth conditions are known.

[15] Note that Floridi considers semantical information to be both an objective and a relational notion, like food. (Floridi, 2010b, pp. 23-24) He denies that semantic information is subjective or relative; for data can have a semantics independently of any informee. (Floridi, 2008a, p. 10) Still it counts as semantic information only with respect to a specific type of informee.

Semantic information can also include non-declarative forms of information, like questions, instructions or orders. Like Floridi does in most of his work, we will focus primarily on declarative forms of information, also described by Floridi as *declarative, objective* and *semantic* information (*DOS-information*). (Floridi, 2005b, p. 352)

It should be remarked that Floridi adds the condition of truthfulness to SDI. The revised SDI (RSDI) and its consequences will be discussed extensively (in the chapters about veridical information). Before that, we must examine data and the consequences of it for the standard definition in detail.

Data: the main constituent of information

Some well-known definitions of data

As mentioned above, SDI requires a definition of data. The word data is the plural of Latin datum, which means "something given". This aspect of data, that it is considered to be "a given", seems to play a role in different definitions, although often it is not made explicit. Again, I will just mention a few definitions to get an impression of the variety of views that are current (no need to explain the notions here):

- Data is a representation of a fact, figure, and idea
- Data has three interpretations: as bits, as hard numbers or as recorded observations. (Ballsun-Stanton & Bunker, 2009)
- Data are numbers, words, images, etc., accepted as they stand (http://en.wikipedia.org/wiki/Data, 20-1 2010)[16]
- Data are things known or assumed as facts, making the basis of reasoning or calculation (Oxford dictionary)
- Data are the lowest level of abstraction from which information and knowledge are derived (Dühr, Colomb, & Nadin, 2010, p. 71)

[16] As a rule, Wikipedia is not to be quoted in academic philosophy, but it can be a an indication or illustration of what ideas can be considered to be common or widespread. Since that is the only thing I am after here, I made the exception that proves the rule.

According to Floridi, none of these descriptions of data will do. To pave the way towards his definition of data, Floridi's recognizes three kinds of (what he calls) interpretations of data and summarizes them (with their problems) as follows. (Floridi, 2008a, pp. 2-4)

According to the *epistemic interpretation*, data are collections of facts. The problems of this interpretation are the following. First, it fails to explain, for example, processes such as data compression. Second, it trades one difficult concept (data) for an equally difficult one (facts), when actually facts are more easily understood as the outcome of some data processing.

According to the *informational interpretation*, data are information. Obviously, in this interpretation one is left with the problem of understanding what data are in themselves and even worse, this would be circular in case the standard (data-based) definition is to be followed, as Floridi intends to do.

According to the *computational interpretation*, data are collections of binary elements (digits, symbols, etc.) processed and transmitted electronically. This interpretation is too restrictive, confusing data with the format in which it may be encoded. For data can also be analogue and continuous.

Since each of these interpretations of data fail to form a definition that is independent of the standard definition of information, Floridi formulates his own definition.

Floridi's Diaphoric Definition of Data

Floridi's definition of data is based on an aspect that is regularly missed in other definitions of data. This is the diaphoric aspect, which was recognized by Bateson in his definition of information as a "difference that makes a difference". Data actually is that difference (or distinction) that, in information, makes a difference (thus that is meaningful). This may be found reminiscent of de Saussures central notion about language, as to be analyzed as a formal system of differential elements.

Floridi makes this point – that data is ultimately reducible to a difference or lack of uniformity – by showing what happens when we erase or loose data step by step. He shows that even if the last sign (for instance a pictogram) is gone, and we are left witch a blank sheet of paper, we still have data as long as there is a difference between the white page and the

page with a sign on it. The white page indicates that there is no sign, and this indication is itself a datum.[17] Thus he argues that the most fundamental nature of data is this diaphoric aspect. (Floridi, 2008a, pp. 4-5)

Another crucial point Floridi makes about data is that data can only be discerned under certain conditions, thus in a certain context and by using a certain *level of abstraction*. The *level of abstraction* predetermines the kind and amount of data that can be extracted from the system the data is considered to be about, by specifying both the features (of the system) that are recorded and the way it is recorded (thus making up the data). In this way, a level of abstraction makes possible an analysis of the system. The distinctions that make up the data should not be thought of as already existing (regardless of any level of abstraction), as if they are merely made significant by some level of abstraction. Instead, these distinctions can only be appreciated or captured as long as the level of abstraction (that "extracts" them from the system they are believed to be about) already is (or has been) applied. We do not have a vast repository of distinctions (that we can treat as givens and need not reflect upon) already available. Floridi's point is that it is thanks to levels of abstraction that we are able to distinguish anything from anything else. It may be a common human experience that we are used to distinguish between things in a certain way so much, that these distinctions (or the objects they "carve out") can look as "givens". But we should not forget that it is only because of the specific way these distinctions are made, that these specific distinctions can come to the fore in the first place.

We will return to this point (that gives rise to the idea that data might be perspectival) later. The above should be enough for now to appreciate Floridi's Diaphoric Definition of Data (DDD). Floridi gives two versions that look quite different, but actually only differ in emphasis of its components.

DDD1: *"A datum is a putative fact regarding some difference or lack of uniformity within some context."* (Floridi, 2005a)

[17] Actually, that the white page indicates that there is no sign is related to the fact that the blank page is interpreted with the possibility of a signed page as an option. These options are determined by the *Level of Abstraction* which will be discussed below.

DDD2: *"the general definition of a datum is:*

> *D) datum = x being distinct from y;*
>
> *where the x and the y are two uninterpreted variables and the domain is left open to further interpretation."* (Floridi, 2008a)

The second version emphasizes the point that data is not yet interpreted. The first definition is much more explicit in the contextuality of the difference by emphasizing that the difference or lack of uniformity is bound to some context. Since Floridi underscores the contextuality of data and information in several articles, there can be no doubt that this is a solid aspect of what he considers to be data. (Floridi, 2010b, p. 12) (Floridi, 2011, p. 25) The first version indicates (although implicitly, by using the term "putative") that the statement (or fact) that there is some difference is hold by some agent. How this is accounted for in the second version will be described when discussing the notion *level of abstraction.*

The diaphoric definition of data, in both its forms, allows for a very wide range of interpretations of data. Floridi makes explicit in what way by positing several sorts of neutrality.

Taxonomic neutrality

The *taxonomic neutrality* states that a datum is a relational entity. By this it is meant that, for instance in the case of a black sign on a white background, neither the black sign or the white background is the datum, but the relation (of being different) between the two. So DDD is neutral to the identification of data with specific relata. (Floridi, 2008a, p. 7)

Typological neutrality

Data can be divided in several typological classifications. Classifications often include *primary data*, for instance that what is stored in a database, *secondary data*, data constituted by the absence of primary data, *metadata*, data about (mostly primary) data, and sometimes a few other types. With *typological neutrality* it is indicated that DDD is neutral with respect to such a typological classification involved; all these types of data are considered data and can constitute information.

Genetic neutrality

The *genetic neutrality* states that data can have a semantics independently of the informee. So DDD is neutral with respect to both possibilities, of data being dependent of an informee and of data being independent of an informee.

Besides these three types of neutrality, Floridi also states that his definition may be applied at three different levels:

- data as diaphora *de re,* as differences or lack of uniformity in the world (Floridi also calls this "dedomena"). Floridi does not consider dedomena to be some form of preschematic or preconceptual empirical content. But a notion like dedomena can be posited as an external anchor of information, or can be seen as required by experience.
- data as diaphora *de signo,* as differences of (perceptions of) states of systems,
- data as diaphora *de dicto,* as differences of symbols of a code or language.

Data is often understood simply as a collection of symbols and as such might be free from epistemological and semantic aspects. However, Floridi's introduction of the notion of (epistemological) *level of abstraction* suggests that the data as defined by Floridi comes with an epistemological aspect. This issue will be discussed later in this paper.

Levels of abstraction

Reality can be studied at different levels, Floridi says, and therefore, forms of levelism – methods that take this idea as an starting point – have been advocated frequently. In his article *The Method of Levels of Abstraction* Floridi defends a version of epistemological levelism, concerning levels of observation or interpretation of a system. (Floridi, 2008b, p. 3) The epistemological notion level of abstraction is central to this method, but it is also central to his conception of data and information in general, as has been shown.

According to Floridi, a level of abstraction is a finite but non-empty set of observables. An observable is not the result of an observation or a record of an observation, but it is a set of possible values, together with the commitment of what aspect (of the thing it is considered to be about) the observable stands for. Or, to stay closer to the terminology Floridi uses, observables are interpreted typed variables. That observables are *interpreted* variables means

that it is specified what feature of the system under consideration the observable is standing for (the choice is made what to represent and in what unit, so to speak). That observables are *typed* variables means that it is made explicit and unambiguous in what values the represented feature of the system is described (the choice is made which values are accepted).

These observables must be understood to be the building blocks that make up and characterize the conceptualization (the model or theory) of the system under examination. (Floridi, 2008b, p. 10) One or more observables taken together, form a level of abstraction, and as such, they predetermine the kind and amount of data and information that can be "extracted" from the system. (Floridi, 2008b, pp. 18-19) Floridi's terminology may not always give the impression that a level of abstraction is to be considered a condition of possibility for data and information. Still it is. The point (made earlier) is, that we cannot consider distinctions as already being given, as if "no work was done" in establishing them. Floridi's point is that we should not forget that we need a specific commitment of what (variable) stands for what aspect of the system it is considered to be about, if our distinctions (and the information based on it) are to make any sense. Therefore, the specifications of these commitments, viz. the level of abstraction, is necessary to be able to appreciate or capture the system under analysis in a specific way. The point is that we apply such commitments all the time without the need to explicate them or to be aware of that. But the fact that that works out quite OK, obviously does not make it irrelevant or acceptable to forget that we apply them in this philosophical context.

So the term *Level of Abstraction* indicates a specific way (of the many possible) in which a system is described. Any piece of content about something is expressed in certain terminology or with a certain legend and with a certain sensitivity, granularity and level of detail etc. These choices, so to speak, make up the level of abstraction at which a model or a piece of information describes a system.

Levels of abstraction and Davidson's attack on conceptual schemes

As Floridi says, the resemblance between levels of abstraction and *conceptual schemes* is close enough to require further clarification. (Floridi, 2008b, p. 28) Floridi argues that Davidson's famous attack on the notion of conceptual scheme does not affect the notion of

level of abstraction, even if Davidson is considered to be successful in criticizing the concept of conceptual schemes. (Floridi, 2008b, p. 31)

According to Floridi, Davidson argues that conceptual schemes are not intertranslatable and that they are inescapable, in the sense that communities of speakers are entrapped within their conceptual schemes. (Floridi, 2008b, p. 29) But, Floridi argues, because of the differences between levels of abstractions and Davidson's notion of conceptual schemes, such things cannot be said to hold for levels of abstractions and their agents. Unlike agents entrapped in conceptual schemes in a Davidsonian fashion, users of levels of abstraction (or LoAs) are not entrapped in them; they can move from one information space to another, and they can expand their information spaces:

> "So, if we are talking about the agents using or implementing the LoAs, we know that agents can sometimes modify, expand or replace their LoAs, and hence some degree of intertranslatability, understood as the acquisition or evolution of new LoAs, is guaranteed." (Floridi, 2008b, p. 30)

Floridi concludes that Davidson's argument does not affect levels of abstraction because Davidson *"... limits his consideration to information spaces that he assumes, without much reason, to be already linguistically and ontologically delimited."* (Floridi, 2008b, p. 31)

Obviously, Davidson's influential argument deserves a more extensive treatment than given above, but this cannot be provided here. It is clear though that Floridi thinks that his levelism survives Davidson's argument, and, I think, we should take serious the possibility that Floridi is correct in this.[18]

[18] Note that there are several replies to Davidson that argue that his attack is not successful. See, for instance, (Baghramian, 2004) and (Wang, 2009). Xinli Wang shows that non-Quinean notions of a conceptual scheme and non-Kantian forms of scheme-content dualism do not fall prey of Davidson's attack. (Wang, 2009, p. 140) As is illustrated above, Floridi's notion of levels of abstraction is clearly different from the notion of conceptual schemes under attack by Davidson. Also, Floridi's equivalent of a scheme-content dualism seems to be unlike Kant's in many respects, suggesting that Floridi's conclusion that he survives Davidson's attack may very well be correct.

Dedomena and the diaphoric definition of data

The point that data may be interpreted to be differences or lack of uniformity in the world, suggests that DDD allows for a fully realistic interpretation of data as "dedomena". I think though, that in fact, Floridi can't accept this as a correct interpretation of "DDD-data". On several occasions, Floridi argues that dedomena can never be found or identified in the real world. They are the "things" we assume our data or information to be about, but essentially their positing involves making an extra assumption that isn't really provided by Floridi's thinking. Floridi puts it in the following way:

> "Dedomena are not to be confused with environmental data (see section 1.7.1). They are pure data or proto-epistemic data, that is, data before they are epistemically interpreted. As "fractures in the fabric of being" they can only be posited as an external anchor of our information, for dedomena are never accessed or elaborated independently of a level of abstraction." (Floridi, 2005a)

The point is that dedomena can never be accessed, observed or recorded without making use of a certain level of abstraction. The conclusion is that, although all data as they show up in our databases, figures or conceptualizations *may* be interpreted as standing for dedomena, these data themselves never *are* these differences in the world itself. The decisions that make up the level of abstraction both predetermine the kind and amount of data (including zero data), and therefore the very possibility to actually record data (at that level of abstraction). So in fact, Floridi's diaphoric definition of data defines data that is already analyzed at a level of abstraction; the diaphoric definition is not about dedomena. Although DDD does not prohibit to assume dedomena to be there, DDD-data excludes dedomena. Additionally, although dedomena might be seen as being free of epistemological aspects[19], DDD-data cannot, for they are dependent of the epistemologically relevant choices that make up the level of abstraction at which they "live".

[19] As far as it makes sense to do that, since the whole point about them (that we cannot observe or access them) is essentially epistemological.

Are data and information perspectival?

Giere's perspectivism

As indicated before, the point made about data – that it always comes with its level of abstraction – sounds somewhat like perspectivism. Roughly spoken, perspectivism is the idea that there is "no view from nowhere", and a perspectivism of data would state that there is "no data from nowhere", and that seems to come close to Floridi's point about levels of abstraction.[20] Obviously however, there is more to it. The term perspective often is used vaguely, and it can be applied broader and is sometimes associated with only human perspectives etc. But aspects like the chosen terminology, the chosen features to discriminate or level of precision of the description certainly would fall under a description of what is meant by the term perspective. Floridi himself indicates that the notion *level of abstraction* is (at least roughly) comparable though more precise than the notion *perspective*, as can be seen in his following text:

> "The participants view the object under discussion according to their own interests, which teleologically orient their perspectives or, more precisely, their own *levels of abstraction* (LoA)." (Floridi, 2011, p. 20)

It will be clear that observations like these don't justify the conclusion that a level of abstraction is the same as a perspective. But they point out that there are similarities, for instance that they are both the condition of possibility for the data or observation or knowledge that they structure. So without any guarantee about the outcome of the question, it seems justified to investigate if Floridi's notions of data and information actually are perspectival.

If we like to answer this question, we should know what it would take for information to be perspectival; we need an account of perspectivity. To give a more detailed picture of what such a perspectivity might amount to, we make use of Ronald Giere's notion of perspectivism

[20] As indicated in the previous chapter, Floridi thinks of data as being made possible by a level of abstraction. As has been explained earlier, this holds only for data as defined according to DDD, not for dedomena.

as he advanced it in his book *Scientific Perspectivism.* In this book he introduces his version of perspectivism as a serious alternative to constructivism at one side and strong objectivism and hard realism on the other. He wants to do justice to some of the constructivist critique at objectivism and realism, while avoiding the excesses. (Giere, 2006, p. 3) Although sometimes it seems accepted to neglect or avoid this debate, Ronald Giere chooses to go another direction:

> "Rather than simply abandoning or ignoring the issues, however, I seek to change the terms of the debate by developing an alternative view that is more than a minor variant on already existing views." (Giere, 2006, p. 3)

This alternative is his version of perspectivism, which is, as Giere puts it, almost wholly developed within the framework of contemporary science. It aims to show that unconditional declarations of the correctness of scientific theories cannot in any way legitimately be based on the practice of science itself. Instead, *"... the practice of science itself supports a perspectival rather than an objectivist understanding of scientific realism".* (Giere, 2006, p. 6) Starting at color vision as an illuminating example of the perspectivity of scientific observation, Giere argues that human observation, scientific observation as well as scientific theorizing and knowledge are inherently perspectival.

Giere acknowledges that perspectivism has antecedents in the work of philosophers such as Leibniz, Kant and Nietzsche. But he explicitly posits his version of perspectivism as a positive view, developed within the framework of naturalism (not as a doctrine, but as a methodological stance). He also underscores that the claims he makes *"... must be reflexively understood as themselves perspectival."* (Giere, 2006, p. 3)

His term perspective is inspired upon the common term, meaning *"a point of view in the sense that, on any topic, different people can be expected to have different points of view"*. (Giere, 2006, p. 13) This use of the term is usually harmless but, as Giere stresses, *"it can be pushed to the absurd extreme that every perspective is regarded as good as any other".* (Giere, 2006, p. 13) Giere points out that perspectives can differ regarding their status in the sense that one perspective can be better than another, given a certain purpose. Therefore "…*scientific perspectivism does not degenerate into a silly relativism".* (Giere, 2006, p. 13)

A well-known argument against both relativism and perspectivism holds that these views are self-refuting. The version of Steven D. Hales and Rex Welshon is directly directed against perspectivism. It can be formulated as follows: If perspectivism is true, than that is at least one claim that is non-perspectivally true, so then perspectivism is false. And of course, if it is false, than it is false. So perspectivism is false. (Hales & Welshon, 2000) Giere rebuts that the argument simply begs the question: *"It assumes that truth is to be understood in objectivist terms, which is just what perspectivism denies. For a perspectivist, truth claims are always relative to a perspective."* (Giere 2006, 81)

As being said, Giere's notion of perspective applies not only to visual perspectives, but to all kinds of observational and theoretical perspectives. Giere does not provide us with a detailed account of what a perspective in this general sense is. But we can infer an account of the notion as he advances it in his book *Scientific Perspectivism*. My description of such a notion would be that a perspective accounts for the way the observation or theory is considered to be about the aspect of the world that is (considered to be) observed or theorized. The perspective accounts for the specific identification of elements of the observation, theory or information with specific aspects of the world.[21] This notion of perspective is close to that of Floridi's observable (and level of abstraction) in that both highlight the "legend function", as it might be called. The epistemological relation that specifies what aspect of the information stands for what aspect of the world or system (as it is considered to be described by it) seems to be fundamental to both notions.

The aspects of perspectivity as implied by Ronald Giere's *Scientific Perspectivism*

Unsurprisingly, Giere uses some notion of "perspectivity" when he argues for the perspectivity of color vision and scientific observation and knowledge in general. Here again,

[21] Giere is most explicit about the function of identification of specific things in the world with elements of the information when he speaks about deploying models. (Giere, 2006, p. 62) This aspect of deploying models seems to be equally relevant in his view of both observing and theorizing. He thinks for instance of pictures as models of observational data. (Giere, 2006, pp. 49-49) And he considers scientific theories to be model-based, in which some aspect of the model is used to represent some aspect of the world. (Giere, 2006, p. 60) So even though Giere does not make this point explicit, I think it can be argued that this function (this "legend function") can be hold to be the crucial aspect of his notion of perspective.

he does not provide us with a definition, however, and he uses the term "perspective" more often than the term "perspectivity" itself. But his vision on what it means when something is perspectival is clear enough to make possible a satisfactory formulation of its constituting aspects. Such an formulation is needed to be able to make a step by step analysis of how these aspects are handled by Floridi, in order to check if Floridi's notions conform to it.[22] This makes it possible to conclude whether or in what respects information must be considered perspectival or not, without requiring that Floridi's level of abstraction is the same notion as Giere's perspective.

The *first aspect* of perspectivity is that those things that are perspectival according to Giere (for instance human or scientific observations, images, models, theories and knowledge) are considered to be *about* something. It is understood to be about some aspect of the examined system, the world or reality. This standard assumption in science can be found anywhere in Giere's approach but it might have been too obvious for Giere to formulate explicitly.

The *second aspect* can be seen as an elaboration of the first. An observation or theory is not only about some object or examined system, it is actually the *product* of both the examined and the examining system. That what is considered to be perspectival, emerges in the *interaction* of the thing it is about and the specific way it is approached (i.e. the perspective). It is not the property of one kind of thing, of either the object or the subject, but *"it is a feature of both"*. (p31) Giere stresses this point repeatedly.

> "Here again, I claim it is misleading to say simply that here we have an observation of the universe as it was 13 billion years ago. What we have is an image of the early universe *from the perspective of the Hubble ACS system using Abell 1689 as a gravitational lens.* The picture is the product of an *interaction* between light from the early universe and the Hubble telescope system." (Giere, 2006, p. 45) [23]

[22] For matters of convenience, I will name the result of my formulation of these aspects "Giere's notion of perspecitivity", but ultimately, it is my attempt to interpret it correctly.

[23] Although Giere is speaking of observation in this example, he generalizes this point to scientific theorizing later on in his book.

Giere makes clear that such a view differs from both objectivism and subjectivism (and constructivism), and that it sometimes is confused with the latter. He prefers to speak of perspectivism over interactionism because the relation is asymmetric. It is asymmetric in the sense that the examining system examines the examined system and not the other way around. (Giere, 2006, p. 32)

The *third aspect* is the point that things considered perspectival, *only* arise in the context of a perspective.[24] Without some perspective, there will for instance be no observation. Giere speaks of perspectival observing and theorizing as the best we can do when trying to describe systems or aspects of the world; we simply cannot transcend perspectives when observing, describing or theorizing about something (Giere, 2006, p. 15). So the strongest claims a scientist can make are of a qualified, conditional form.

> "There is no way legitimately to take the further objectivist step and declare unconditionally: 'This theory (or instrument) provides us with a complete and literally correct picture of the world itself" (Giere, 2006, p. 6)

Giere does not suggest that we are entrapped in a specific perspective and can never escape it. Rather, his account shows that science and scientists can hold many perspectives, and that scientific observation and theorizing cannot be from no perspective at all, but instead, is always from some perspective.

It is clear that this point is related to the second aspect. According to this, the observation or theory is the product of both the examined system and the perspective. From this it follows that there will not be that product if one of those (in this case the perspective) is not there. A reply may be that taking many perspectival views and combining it in a higher order theory can lead to objectivity. But, as Giere points out, this is simply mistaken. Adding or combining perspectives will always result in either a set of perspectives, or in a new (composed, maybe higher level) perspective, but never in no perspective at all. (Giere, 2006, p. 93) He also illustrates this with an example:

[24] This is what Stephen Palmquist calls the "principle of perspective" (Palmquist, 1993)

> "Before the seventeenth century, the Milky Way, (…) was perceived using human eyes simply as a broad band of light extending across the night sky. From the perspective of Galileo's roughly thirty power telescopes, it was perceived as being made up of a very large number of individual stars. But this was a change in perspective, not a move from a mere perspective to objectivist truth." (Giere, 2006, p. 58)

A *fourth aspect* is the *partiality* of perspectives and hence of perspectival observations and theories. A perspective is sensitive only to a particular kind of input and blind to all the rest. Therefore, something perspectival is only about certain aspects of the world and never describes all there is to say about it.

A *fifth aspect*, related to the fourth, is that there can be more perspectives on the same thing. Those perspectives can be completely different, but they can also overlap. Aspects of a phenomenon, not discernable from the first perspective, may be discerned from a second. According to Giere, the fact that more perspectives on the same thing can be adopted is an important factor in scientific progress.

The *sixth point* is that these different perspectives are compatible in principle and that the differences in for instance observations are related to the differences in perspectives. Giere brings up this point several times. For instrumental perspectives Giere puts this as follows:

> "Differences in images produced must be due to differences in the makeup of the different visual systems. There is nothing at all contradictory about different systems producing different images with the same input." (Giere, 2006, p. 57)

Giere acknowledges that there is an assumption behind the fifth and sixth aspect. That is the assumption of one (uniquely structured) world. This idea can be regarded simply as a well-entrenched maxim of scientific practice, so it need not be regarded as a metaphysical doctrine. (Giere, 2006, p. 35)

To elaborate on Giere's point may we might say that, via the assumption of perspectives on one uniquely structured world, all different perspectival findings about that world, can be

considered consistent and systematically related to one another. And this seems to be exactly the idea that "make scientists tick".[25]

The *seventh and last aspect* is related to the fact that perspectivism differentiates between the perspective and the agent or subject. The perspectival entity is related primarily to the perspective (and of course the thing it is about), but only secondary to the agent or subject. This terminology allows to speak of different kinds of agents or systems to hold a perspective, as Giere frequently does. He speaks for instance of "the perspective of color science" (Giere, 2006, p. 40), of "the perspective provided by Malin's three-color process" (Giere, 2006, p. 43), of the "Copernican/Newtonian perspective" (Giere, 2006, p. 94) of "a particulary human perspective" (Giere, 2006, p. 32) and of perspectives of humanly produced artifacts (Giere, 2006, p. 116).

To resume, the fact that we can say that for instance a theory is perspectival does mean that it is partial and that there are in principle other ways to theorize about the same thing. But it does not mean that all theories are as good as any other; it does not mean that everything goes. For that there are alternatives has nothing to do with the aptness or fitness of the theory, considering the purpose at hand. It also does not lead to "fragmentism" or the idea that we can only speak in many different tongues that have nothing to do with each other. On the contrary, the methodological maxim as is current in science yields in a view that actually prescribes consistency of the potentially very different views. It also does not lead (at least not necessarily) to anti-realism. In the context of a perspective, there is always some reality given. Above this, if we accept the assumption of one world as constitutive of scientific perspectivism, then Giere's perspectivism clearly leads to a form of realism, to perspectival realism as Giere himself calls it.

[25] Note that such an idea does not entail a form of objective realism. Unlike many scientists, Giere only assumes the unique causal structure as a methodological presumption. (Giere, 2006, p. 34)

The aspects of perspectivity in Floridi's notions of data and information

Now that it is clarified what aspects play a major role in constituting perspectivity in Giere's sense, we are ready to discuss if data and information in Floridi's sense must also be considered perspectival.

As for the *first aspect*, the "aboutness" of the perspectival entity, the case is straightforward. Floridi considers this "aboutness" to be a basic aspect of both data and semantic information: *"Semantic information is primarily understood in terms of* content about a referent*."* (Floridi, 2010b, p. 3)[26]

With respect to the *second aspect*, the aspect of interaction, the case is more complicated. According to this aspect the perspectival entity is understood to be the product of the system under examination and the perspective. Floridi does not (literally) say that data or information is the product of the level of abstraction and the object under examination. But what he does say may come quite close. About models (which are consisting of information) he says for instance:

> "Models are the outcome of an analysis of the system, developed at some LoA(s) for some purpose." (Floridi, 2008b, p. 18)

> "One might think of the input of a LoA as consisting of the system under analysis, comprising a set of data; its output is a model of the system, comprising information." (Floridi, 2008b, p. 18)

In the first citation, Floridi is more specific, speaking of an analysis of the system at a level of abstraction and for some purpose. In the second citation, he speaks just of the system as the input and the model as the output of a level of abstraction. Both wordings are different from Giere's way of putting it, for Giere does not speak of input; he speaks of the perspectival entity as being the product of the system and the perspective. But the consequence of both Floridi's ways of putting it is still the same, in that the model is the product of both the level

[26] Referring to Dretske, Floridi literally speaks of "*this 'aboutness' feature".* (Floridi, 2010b, p. 3)

of abstraction and the system.[27] So Floridi's notion of *model* certainly seems to share this aspect of perspectivity. But what does that mean for information and data? Since *model* is to be understood as comprising information, the most natural interpretation is that information shares this aspect of perspectivity as well. The case for data is even less straightforward, however. To clear it up, we have to look closer to the way Floridi uses the word data in the citation above.

As discussed earlier, Floridi accepts the use of the word *data* for *dedomena*, which he describes as data before they are epistemically interpreted. But these dedomena cannot be accessed or elaborated independently of a level of abstraction. So when Floridi speaks of data, as the input of a level of abstraction, he might have these dedomena in mind. On the other hand, the data we actually work with, the quantifiable differences (about which Shannon's information theory gives us the basic principles), these data are already the result of an application of a level of abstraction to its input. So both uses of the word data stand for very different notions. And therefore I think we should be very careful in our use of the word data for both data as dedomena and data that is already epistemologically interpreted (at some level of abstraction). For that reason, I will discriminate between the two from now on by using the terms *dedomena* and *data* respectively.

As a result of this distinction, the picture becomes much clearer. Dedomena do not share the perspectival aspect of interaction, for they are thought of as not being mediated by a level of abstraction. But data, as being post-epistemic, are the product of the level of abstraction and (the input delivered by) the system. Therefore, data and consequently information do possess this aspect of perspectivity.[28]

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[27] Floridi sometimes is more specific and distinguishes more factors. In his article *Semantic Information and the Correctness Theory of Truth* (Floridi, 2010b) he also speaks of context and purpose. We will return to this point when we discuss his theory of truth.

[28] Note that the conception of dedomena articulated above seems to be vulnerable to the critique of the myth of the given. However, I don't think this need to have an effect on the tenability of Floridi's notion of data. For Floridi does not seem to commit himself to the existence of dedomena. The genetic neutrality – by which he renders an interpretation of data as dedomena as an option – seems to be intended mainly to make his framework acceptable for a broader audience, under which those who prefer a realistic reading of a notion of data. But as I see it, Floridi does not commit himself to such a realistic notion of data. His emphasis on levels of

There is a shorter way to demonstrate that (DDD-)data and (as a consequence) information possess this perspectival aspect. Since the choice of a level of abstraction pre-determines the type and quantity of data that can be considered (with zero data as a possible outcome), the level of abstraction is an indispensible factor in yielding data (and consequently information) as an output. And this corresponds to the scheme that data and information are the product of both the system and the level of abstraction at which it is analyzed.

In the end, the point is quite simple: reality will be modeled according the level of abstraction adopted. (Floridi, 2009, p. 32)

The *third aspect* is the point that the perspectival entity cannot be there without some perspective, as it has to be "produced" by the interaction between the thing under examination and the perspective. As has been said before, this aspect is strongly related to the second one. With the result of our work above, we can conclude right away that this does not hold for dedomena, but it holds for data and for information. Data and information are only accessible at a specific level of abstraction; they are always qualified by their level of abstraction. Floridi is even more pronounced than Giere about attempts to forgo such a qualification or conditioning:

> "… the strive for something unconditioned is equivalent to the natural yet profoundly mistaken attempt to analyse a system (…) independently of any (specification of) the level of abstraction at which the analysis is being conducted, the questions are being posed and the answers are being offered. In other words, trying to overstep the limits set by the LoA leads to a conceptual mess." (Floridi, 2008b, p. 23)

Several pages later, after making roughly the same point, he underscores this again: *"But do not ask absolute questions, for they just create an absolute mess."* (Floridi, 2008b, p. 32) The bottom-line is that perspectives (for Giere) or levels of abstraction (for Floridi) are not to be seen as something we have to get rid of. On the contrary, they make possible the data, information, model or theory. According to Floridi, *"... epistemology is LoA based and no ontology can be LoA-free."* (Floridi, 2009, p. 32)

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abstraction as the condition of possibility for his diaphoric conception of data, shows, in my opinion, that Floridi's is well aware of the problematic status of pre-epistemic givens, and it accounts for it.

The *fourth aspect* of perspectivity is the partiality of perspectives and hence of the perspectival entity. Here the case is straightforward again. Both data and information are partial in this sense. Specific levels of abstraction are needed to describe specific aspects of the system under analysis, and other levels of abstraction are needed to capture other aspects. But reality is never fully captured. (Floridi, 2009, p. 28) For unexplored levels of abstraction might be needed to capture some yet unknown traits of reality.

The *fifth aspect* of perspectivity, that there may be alternatives, seems to apply on data and information as well. A system under examination may be analyzed at different levels of abstraction, yielding different data and information about that system. These different levels may be visual, as with different camera's on the same sports event. Or they may be of different kinds, like Floridi shows in his example about wine. Wine may be analyzed in terms of its taste (its nose, fruit, tannicity etc.) or in terms of its chemical components, or in its market value etc. Floridi advances a terminology including a formal machinery for relating different levels of abstractions (for instance in a so called *gradient of abstraction*). Levels of abstraction can for instance overlap with each other or be completely disjoint or fully nested. (Floridi, 2008b, pp. 15-16) So for Floridi, the idea of different pieces of information about the same system is not only accepted, it is accounted for in a systematical way.

The *sixth aspect* is about the compatibility of perspectives. Differences between for instance different observations of the same thing are not to be interpreted as inconsistencies between observations. Instead, these differences are related to or explained by differences between the perspectives used. Although Floridi doesn't speak about this in terms of compatibility, he thinks along the same lines. The following passage illustrates that.

> "… I have argued that it [the level of abstraction] must be made clear before the properties of the system can be sensibly discussed. In general, it seems that many disagreements might be clarified and resolved if the various 'parties' make explicit their LoA. By structuring the explanandum, LoAs can reconcile the explanans." (Floridi, 2008b, p. 32)

In that last sentence, Floridi suggests that the different models of the system can be reconciled by being explicit about the differences between the levels of abstraction which

(with the system as input) resulted in these models.[29] In a fashion similar to Giere's, Floridi argues against "anything goes relativism" and he argues for the capabilities of thinking in terms of levels of abstraction with respect to for instance avoiding confusion and being more specific or precise about what is "said" with a certain piece of information and what not. Instead of positing the methodological presumption of "one world", Floridi advocates an informational approach to structural realism (Floridi, 2009, p. 2) He speaks of invariant structural properties (as they relate with our levels of abstraction) as what is science is mainly interested in. (Floridi, 2009, p. 28) Although Floridi puts it in different wordings, I conclude that Floridi is on the same record as Giere with respect to this aspect of the compatibility of perspectives as well.

The *seventh aspect* is that several kinds of agents can hold perspectives. Floridi has the following to say about such an idea:

> "Different sorts of empirical or abstract agents – not only human beings but also computers, animals, plants, scientific theories, measurement instruments etc. – operate and deal with the world (…) at some LoAs. By neatly decoupling LoAs from the agents that implement or use them, we avoid confusion between CSs [i.e. conceptual schemes], the languages in which they are formulated or embodied, and the agents that use them." (Floridi, 2008b, p. 29)

So Floridi certainly holds that several kinds of agents can implement or use levels of abstractions. He considers the decoupling of the level of abstraction from its agent to be helpful for avoiding confusions. Because data and information are extracted by the level of abstraction, and not (at least not primarily) by the agent, it explains how data and information can be understood to be objective, while allowing for the (perspectival) effects induced by the use of different levels of abstraction. The same information can be hold by different agents, even of different kinds, as long as the used levels of abstraction are the same. Another effect of the decoupling is that it enables us to speak of the accessibility of levels of abstractions. Some agents might be able to use or implement a specific level of abstraction, while that level of abstraction might not be accessible to other agents. As a consequence, some agents can appreciate or process a specific piece of information, while others cannot.

[29] As we have seen earlier, a model comprises information.

The perspectivity of data & semantic information

I think, the result of this analysis is clear. Both data (not being dedomena) and information conform to all seven aspects of perspectivity, and thus must be understood to be perspectival in Giere's sense. This is a very interesting finding, confirming that (a version of) perspectivity plays an important role at the very heart of Floridi's concept of information.

That being said, there are still significant differences between Giere's scientific perspectivism and Floridi's ideas. We should consider these, before we jump to the conclusion that Floridi's levelism makes him a perspectivist.

First, perspectives in Giere's sense cannot be identified with levels of abstraction. Giere uses the term perspective rather loosely. He doesn't always make a clear difference for instance between the observational system and the perspective of that system. At other times he does not seem to make a clear difference between a scientific theory and the perspective of the scientific theory. Floridi, on the other hand, is quite precise about what he means with a level of abstraction, and gives us the formal machinery to relate levels of abstraction and group them into a gradient of abstraction. On top of this, he discriminates precisely between what is a model, a theory, a level of abstraction etc. Floridi's notion level of abstraction is more clearly delimited has a more restricted meaning than Giere's perspective. In his correctness theory of truth, Floridi discriminates between levels of abstraction, purpose and context. He considers the content of information to be dependent on all three factors. In Giere's analysis, such distinctions are not (consistently) made; Giere's notion of perspective sometimes seems to include purpose and (aspects of) context.

As we have seen, Giere makes the point that the claims he makes must be understood as themselves perspectival as well. This makes him a strong perspectivist.[30] Floridi does not make such a point explicitly. This might mean that Floridi is a weak perspectivist at the most. But it seems to me that, given the way Floridi emphasizes the importance of levels of abstraction and their indispensability for data and information (and for the models and theories build on them), it is highly unlikely that Floridi would deny that his own views involve levels of abstraction. So I think that he accepts that his own views are committed to

[30] See for instance (Baghramian, 2004) for an account of this distinction.

specific levels of abstraction, and then, Floridi's levelism would be strong, just like Giere's perspectivism is.

Floridi does not seem to make a difference between perspectivism and relativism, and he avoids relativism. He defends *"a form of realist ontology that is compatible with a non-relativist and yet LoA-based epistemology".* (Floridi, 2009, p. 33) That being said, the point Floridi attacks in both relativism and perspectivism is exactly the same as the point the perspectivist Giere attacks in relativism. It is the idea that "everything goes", that every perspective is as good as any other that is under attack by both. So the main difference between the two seems to be in their conception of what perspectivism amounts to. Seen from Giere's perspective, Floridi fails to see that Hales and Welshon's attack on perspectivism is unsuccessful, so Giere and Floridi seem to have different interpretations of that argument. But they agree on a much more important point, namely that approaches like "everything goes relativism" are to be refuted.

The (remaining) differences can give the impression that Floridi's approach should not considered to be a perspectivism. But if we look at the points in which his approach actually differs, we have to conclude that most are (relatively minor) refinements rather than structural differences. So the conclusion seems to be justified that Floridi's levelism is an interesting (and in some ways more detailed and promising) elaboration of a more general and vaguely formulated perspectivism.

Concluding, it must be said that Floridi's notions of data and (not necessarily veridical) semantic information are perspectival.[31] On top of that and notwithstanding the differences between Floridi's notion of level of abstraction and Giere's notion of perspective, we can conclude that Floridi's levelism is much closer to perspectivism than he presents it to be.

[31] Note that in this chapter we discussed data and semantic information that is not considered to be necessarily veridical. The case for veridical information and its consequences will be discussed in the next chapter.

Veridical information and Floridi's Correctness Theory of Truth

We have looked closely to both data and (not necessarily veridical) semantic information. We found that both are perspectival in same sense as Giere finds scientific observation and theorizing perspectival. Now it is time to take the next step and discuss in detail what is the case for semantic information that also is veridical.

The veridicality thesis

In *Is Semantic Information Meaningful Data?* Floridi argues that data that is well-formed and meaningful still might not count as semantic information. (Floridi, 2005b) He makes the point that well-formed and meaningful data that additionally can be qualified as true or untrue provide only necessary (but still insufficient) conditions for semantic information. If the information is to qualify as semantic information, it should be veridical as well. This is called the veridicality-thesis. According to it, semantic information is not meaningful data that (additionally) can be assigned truth-values. So it is not a truth bearer, like propositions are. Instead, it is truth-constituted, as Floridi calls this. Information that is not true, is not information at all. Like a "false policemen" is no policemen at all, "false information" (or misinformation) is no information at all. [32] (Floridi, 2007, p. 40) So, instead of calling it truth-constituted, we might also call it true by definition.

In the article Floridi advances a long series of arguments to make this point, and he brings forward a number of issues that can be solved by this approach. It seems that he tries to settle the issue once and for all. Even so, I think that there is a crucial omission in this discussion of Floridi about the veridicality thesis.

[32] Obviously, the reason that semantic information (according to Floridi) does not bear truth values has nothing to do with presupposition failure. In the latter case, sentences cannot have truth values because the presuppositions fail (for instance because the referent does not exist). According to Floridi, semantic information cannot bear truth values because it is redundant; it wouldn't be information if it was not true.

As we have seen, Floridi strongly emphasizes the importance and indispensability of levels of abstraction in several articles about semantic information, data and levels of abstraction. He vigorously warns for the conceptual mess that results when one tries to overstep the limits set by the level of abstraction, striving for something unconditioned using unqualified or absolute formulations. Considering this, it is striking that he never makes such a point in both articles in which he defends the veridicality thesis. The term level of abstraction is not even mentioned once in both articles.[33]

This raises a few questions. Could it be that levels of abstraction aren't important for Floridi after all? Or are they simply irrelevant for a discussion about the veridicality of information? Or is he deliberately separating both aspects of his thinking because they don't go well together? It might even give the impression that there are two Floridi's, one that argues boldly to be fully transparent about the inescapable conditionality in models, information and statements, and another Floridi that, without any qualification, speaks of information being true or not, as if such statements don't involve any specific level of abstraction at all.

The Correctness Theory of Truth of semantical information

Obviously, there is only one Floridi and actually, it is this Floridi who tries to address this very issue in a (much needed) article named *Semantic Information and the Correctness Theory of Truth* (Floridi, 2010b) In the abstract of this article he starts with remarking that, until now, it is left implicit what it means for information to be true. Although this is very true, he does not mention the fact that he himself is one of the more notable authors that can be hold accountable for this omission. Luckily, he comes with a serious attempt to address the issue, using almost forty pages to discuss the complex matters at hand in depth.

As remarked by Floridi himself, the veridicality thesis raises two major questions. The first is how semantic information can turn into knowledge or what the difference is between semantic information and knowledge. This question is discussed after we have dealt with the issue of veridical information.

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[33] These articles are *Is Semantic Information Meaningful Data?* (Floridi, 2005b) and *In Defence of the Veridical Nature of Semantic Information* (Floridi, 2007).

The second question is the question what it means for semantic information to be truthful. Floridi approaches this question by using "reverse engineering", inspired by the so named software engineering technique. This approach consists in assuming the artifact (in this case a piece of veridical semantic information) as given, and then trying to discover the principles governing its properties and workings by analyzing its structure, function and operations. (Floridi, 2010b, p. 8)

In the first step, Floridi shows that all kinds of semantic information are translatable into propositional semantic information. In the second step he shows that propositional semantic information (and therefore all semantic information) can be polarized into a combination of a query and a result. Again, he emphasizes the need to specify the *level of abstraction* (LoA) at which the query is formulated. On top of that he mentions two other parameters that have to be specified. These are the *context* (C), in which, and the *purpose* (P) for which the query is formulated. The context is mentioned separately, for it can reveal aspects that might be left unspecified without it, while they are relevant for interpretation, like who speaks or what is referred to. We will follow Floridi in using the acronym *CLP* to refer to all three parameters at once.[34]

According to Floridi we need to specify these parameters, for many (if not all) pieces of content, like for instance "Where is the beer?", only make sense in a specific context, at a certain level of abstraction and given the purpose at hand.[35] With the emphasis on specifying these parameters he picks up again his habit of arguing for being explicit about the levels of abstraction, as indicated by the following quote: *"It is a bit of a pain, but we need to keep these variables in mind, lest the conceptual mess becomes unmanageable."* (Floridi, 2010b, p. 13)

[34] He follows Austin (Austin, 1950) and Strawson (Strawson, 1964) in adding context and purpose respectively.

[35] Note that we have set our scope to what Floridi calls DOS-information (declarative, objective and semantic information) (Floridi, 2005b, p. 352), which excludes questions. Floridi analyses such information into a combination of a question and an answer, in which both are CLP-parametrized. (Floridi, 2010b, pp. 12-14) So the question "where is the beer?" must be understood here as a piece of content that constitutes a piece of DOS-information.

In what he calls the third step he translates the combinations of query and result such that all content is shifted to the side of the queries, by normalizing them into yes/no questions. These steps transformed "The beer is in the fridge" into: "Is the beer in the fridge?"(CLP-parameterized) + "yes". The first part can be thought of as the content and the second (the response) is meant to saturate the information deficit brought about by the query.

Floridi continues by explaining that the saturation consists of two components. The query first must be verified and then validated (in the Software Verification and Validation sense of these terms[36]) for it will be saturated. The verification comes down to verifying the CLP parameters of the query. Only if those are verified, one speaks of the same referent on the same level of abstraction etc. If this verification is successful, the content can be validated. This makes us arrive at the core of the analysis of the correctness of semantic information, or at what Floridi calls "the heart of the problem".

Floridi chooses not to analyze the correctness of the validation in terms of a known concept of truth, for he wants to provide a non-circular way of showing what it means for semantic information to be true. He thinks of his approach as leaving semantics and epistemology, and as entering into the realm of pragmatics, the realm of actual interactions (between an agent and a system) This can provide some exogenous grounding for evaluation of the quality of the model, as the test of correctness is done in this realm of pragmatics. Simplifying, the idea is that if the model of the system is adequate, that then an agent holding it gains access to that system in a pragmatic sense. In Floridi's vocabulary, the model of the system is adequate if and only if the agents *proximal access* to the model *commutes* with this agents *distal access* to that system. Thus the information "The beer is in the fridge" is correct if and only if holding it entails the distal access to the beer in the fridge, by which Floridi (in this example) means that the informee can actually see it in the fridge or take it out the fridge. Hereby an explicit reference to the agent or informee is introduced. The agent has two ways to access the system, one via the information or model to be tested, and the other via the "actual

[36] Software Verification and Validation is the overall process of checking the so-called "fitness for purpose" of an artifact, by ensuring that the software being developed complies with the given specifications and accomplisches its intended purpose, meeting its requirements. For an explanation see (Floridi, 2010b, p. 19).

interaction to the system" that is accepted to constitute the test of the adequateness of the model under test.

Although Floridi presents "the actual interaction with the system" as forming an exogenous grounding, living in another (the pragmatic) realm, he makes clear that in the end both the model under test and the system are models, themselves constituted by information and thus by data sets that came extracted by their levels of abstraction. So ultimately, his correctness theory of truth is about testing of models against models. Floridi points this out on several occasions (referring to his Correctness Theory of Truth by abbreviating it as *CTT*):

> "The reader may recognize here a Kantian point: CTT analyses truth as a relation between models and never shifts from talking about semantic information to talking about systems in themselves (…)". (Floridi, 2010b, p. 29)

> "in CTT we never speak about the ultimate, real nature of the world in itself, but compare data sets (the model) to data sets (the system)" (Floridi, 2010b, p. 30)

> "CTT (…) requires truth to be only a semantic relation between models." (Floridi, 2010b, p. 31)

The Kantian point Floridi refers to is that the way we experience or describe the phenomena or objects, depends on the way our mind actively, according to its own a priori rules, processes the sensory input. The system, about which Floridi speaks in CTT, is not the "system in itself", but it is itself "an appearance". It stays within the boundaries of such a priori rules, which is expressed by Floridi by calling it a model or sometimes a data set (that is extracted by the corresponding levels of abstraction).

Floridi considers CTT to be able to avoid the problems associated with a correspondence theory of truth. He also makes clear that CTT can be compatible with coherentist approaches to truth, but is far from being one. According to Floridi, CTT is compliant with some ideas from deflationalist theories of truth. And CTT is capable of handling semantic paradoxes as well. It is not possible go into any detail about these issues here, but I suggest to read (Floridi, 2010b, pp. 30-38) for Floridi's discussion of these matters.

To end, it must be said that, in the idea that CTT requires truth to be *"only a semantic relation between models"*, there is an obvious similarity between CTT and a "Tarskian"

approach. Immediately after Floridi points this out himself, he continues: *"according to CTT 'snow is white' is true if and only if 'yes' is the correct answer to 'is snow white?'"*. (Floridi, 2010b, p. 31) This similarity may suggest that CTT is providing a purely semantic definition of truth. But even if it would, it would not make veridical information a purely semantic, non-epistemological notion. For veridical information is made of data and we already found that data is made possible by making choices (or selections) that are epistemological substantial.

The perspectivity of (veridical) semantic information

Now the question should be asked if the addition of the requirement of veridicality does change the perspectival nature of semantic information. It may seem obvious that Floridi's CTT does not change anything with respect to central notion of semantic information. For none of the seven recognized aspects of perspectivity are changed or altered by the correctness theory of truth. Veridical information still is about something (a system), cannot be brought about without a level of abstraction but instead needs both the system and a level of abstraction, it is partial, allows other accounts of that system, those accounts are consistent which each other in principle, and might be hold by different (types of) agents.

But what is added is a test of correctness. That word alone suggests that something like a (possibly absolute) criterion (or set of criteria) plays a role in qualifying information. So what should be looked after is the question whether the addition of the criterion involves adding non-perspectival elements to the conception of semantic information.

Giere's account on testing

Again we can look at Giere's perspectivism to get an idea what a perspectival account on testing for correctness (in research in science) may amount to. Giere describes that a scientific theory is tested against the observations. These observations themselves are the product of the observational perspective and the system under examination. Thus at the one hand the system under examination is described in the proposed model (the model that has to be tested). And on the other hand, that same system is examined from well-known observational perspectives. Those perspectives (and the model of the system they yield) are part of accepted science and therefore granted to form the test. (Giere, 2006, pp. 89-90)

The similarity with Floridi's CTT is obvious: scientific models also are tested by two-way access to the system under examination. This suggests that Floridi's approach to testing correctness also is perspectival in Giere's sense. But there are more ways to approach this issue and more potential problems to account for.

Correctness as dependent of the CLP-settings

Floridi makes clear that it is only possible to speak of veridical information given the CLP-parameters. Without the CLP parameters it cannot be decided what referent the semantic information is about and what level of precision or detail is involved. This means that the CLP-parameters also have an influence on what model can be accepted to judge the correctness of the content, for that model must conform to (that aspect of) the CLP-parameters. So the settling of the issue what criterion can be accepted to determine the correctness of the model, is (at least partly) dependent on the CLP-parameters. And this means that the truth "constitutedness" of veridical information is itself CLP-constituted and thereby perspectival at the heart. The bottom-line is that the correctness Floridi speaks about is not correctness *simpliciter*, but it is correctness given the associated level of abstraction, context and purpose. Thus in this sense, this account of correctness is perspectival.

Perspectivism allows for hierarchy between perspectives

Until now we have seen that veridical information seems to be fully perspectival. Yet it is clear that in Floridi's CTT there can be a hierarchy between models. For the agent, the model under test is associated with the so called "system", which is the reference model that is granted the authority to constitute the test for the model under test. As we have seen, Giere also accepts hierarchy between perspectives, for he accepts that certain perspectives are granted to form a test for other perspectives that still are to be tested.

But perspectivism often is associated with the idea that there are no privileged perspectives.[37] So it may be wondered whether the acknowledgement of hierarchy between perspectives may make CTT non-perspectival.

[37] As, for instance, Maudemarie Clark observes in (Clark, 1990, p. 142).

I would say, on the contrary. I think it can even be argued that a perspectivism that doesn't allow for hierarchy between perspectives might not be consistent. The point is that the conclusion that perspectives are of equal standing itself is a judgment of the value of perspectives. And the idea that it is possible to judge something (for instance the value of perspectives) without using any specific criterion, is in contradiction with the core idea perspectivism is about. Perspectivism is about the acknowledgement that the actually used perspective both effects what is discerned and is necessary to be able to discern at all. So if a purpose is given, a certain perspective can be (far) superior to another. If for instance the purpose is to check whether the ball in a soccer game is driven into the goal, a view at the goal from the goal line is superior from a view from the center spot. But without any purpose or interest given, the conditions that are needed to value a perspective are not met. And then it is not possible to speak in a sensible way about value at all, which also implies that it is not possible to (sensibly) say that the perspectives are of equal value.

So from a perspectivist point of view, Floridi seems to make a perfectly acceptable step, by acknowledging purpose by specifying the CPL-parameters. And given those parameters, a certain perspective can be superior or privileged. Obviously, this general conclusion does not justify any specific choice for a reference model. It only shows that within perspectivism there is room for a construction as we find in CTT by showing that there can be privileged models or perspectives, given the CLP-parameters.

Veridical information is perspectival

The conclusion to be drawn from above arguments is that the test of correctness is itself perspectival. Since "pre-veridical" semantic information (i.e. semantic information that is not necessarily true) is perspectival as well, we can now conclude that veridical information is perspectival. Further, the veridicality thesis as accounted for in CTT, did not provide any reason to argue that Floridi's approach differs structurally from a "Gierean" form of perspectivism. On the contrary, Floridi's account of testing for correctness has shown to be fully in accordance with Giere's approach. This may be taken to be another reason for understand Floridi's views as a form of perspectivism.

With this sorted out, there remains still a lot to discuss about the particular construction and formulations chosen by Floridi. Before we will discuss those, we will first cover the issue of the relation between veridical information and knowledge.

Veridical information, justification and knowledge

Now we have seen that veridical information is perspectival as well, it is time to consider the relation between veridical information and knowledge.

Floridi's definition of veridical (semantic) information[38] requires data to be well-formed, meaningful and veridical. This raises the question after the difference between veridical information and knowledge. For, to speak with Floridi, this *"nests semantic information into knowledge so closely that one is naturally led to wonder whether anything else might be missing".* (Floridi, 2010b, p. 7) In everyday life, there may be little reason to distinguish between the propositional attitudes of *being informed* versus *knowing*. Normally it is far more interesting to know that the content concerned is correct. But philosophically there are still important differences, for it is possible to be informed about something without actually knowing it.

First, as the widespread definition of knowledge as "justified true belief" clearly points out, what is missing to upgrade veridical information to knowledge is some account of justification.[39] Also, as shown in (Gettier, 1963), a definition of knowledge as justified true belief does not provide sufficient conditions for someone's knowing a given proposition. A correct guess, for instance, cannot be accepted to be knowledge. Therefore, epistemic luck must be banned out if the process is to deliver knowledge. On the other hand, epistemic luck does not affect the state of being informed. Thus if someone holds information by epistemic luck, that information still qualifies as information. Further, it seems acceptable for the state of being informed that this is not necessarily a reflective state (the agent might not be informed that he is informed) and that it might be opaque (the agent might not understand the

[38] Note that Floridi often speaks of semantic information when he refers to what we call veridical information or veridical semantic information because he thinks we should always think of semantic information as being veridical.

[39] In (Floridi, 2004a), Floridi expresses this definition the tripartite account of propositional and fallibilist knowledge that *p*, according to which an epistemic agent *S* knows that *p* if and only if: *p* is true, *S* believes that *p*, and *S* is justified in believing that *p*. (Floridi, 2004a, p. 61).

information), while this might not be acceptable for the state of *knowing that*. (Floridi, Forthcoming, pp. 6-7) So actually, there is quite a lot that makes that veridical information is not (yet) knowledge.

Veridical information and the upgrade to knowledge

According to Floridi, the Gettier-type problems (for defining conditions sufficient for someone's knowing a given proposition) are logically unsolvable. (Floridi, 2004a) The root of the problem is that *"... the tripartite definition presupposes the possibility of coordinating two resources, the objective truth of p and the subjective justification of the knowing subject S, which, by hypothesis, can always be de-coupled."* (Floridi, Forthcoming, p. 24) Therefore, it is always possible that the truth of *p* and the reasons that justify the agent in holding that *p* cannot be successful coordinated, so Gettier-type counterexamples cannot be banned out.

This all does not prevent Floridi from trying to find a way to upgrade veridical information to knowledge. Although this is not at the core of our discussion, I will discuss Floridi's attempt briefly here, primarily with the aim to illustrate how to perceive of the position of veridical semantic information, relative to knowledge and not so much as to address the problem of getting to a satisfactory account of knowledge itself.

Floridi takes the abovementioned difficulties as a reason to stop attempting to define knowledge doxastically and he opts for an "informational definition of knowledge" instead.[40]

> "So the constructive strategy consists in breaking away from the constraints that make the problem unsolvable: we no longer try to define knowledge doxastically and by relying on a logic of subjective justification, but informationally, and by using a logic of objective accounting." (Floridi, Forthcoming, p. 25)[41]

[40] A doxastic account of knowledge is an account in terms of (subjective) belief, an informational account is an account in terms of information.

[41] The logic of objective accounting cannot be explained here. Please see (Floridi, Forthcoming) for Floridi's account of it.

This "informational definition of knowledge" is (roughly) as follows. Agent *S* knows that *t* if and only if *t* is a piece of (veridical) semantic information, which is correctly accounted for, and *S* is informed both that *t* and that *t* is correctly accounted for. What this "being correctly accounted for" means cannot be explained in full detail here. But for our discussion, the following (hint at an) explanation should suffice. The idea is that what (veridical) semantic information *t* lacks to become knowledge, is the necessary structure of relations that allow different packets of information to account for each other.[42] If on the other hand, *t* is embedded in such a structure of relations (in such a network of relevant questions and corresponding correct answers) this can (and will) provide the necessary account. Thus "being correctly accounted for" refers to being embedded in such a network.[43]

In order to upgrade from veridical information to knowledge, what is added is a network of mutual relations with other pieces of veridical information. Since all these pieces are veridical information and thus are themselves perspectival, it seems obvious that also in this step of upgrading, the perspectival character will be retained, so that we might say that knowledge (in such an informational account) is perspectival too. But it would take too much to make the full argument here. This holds even more for the (more problematic) doxastical notion of knowledge. I will not pursue an analysis after what consequences of the extra requirements in (like the requirements of being non-aleatoric, reflexive and transparent) might have for the potential perspectivity of the knowledge involved. It might seem natural or even logical to draw the conclusion that also such an account of knowledge must perspectival as well. But here I cannot go any further than saying that all components that knowledge shares with veridical information must be considered perspectival.

So much about the knowledge and how it is related to information. We will now return to the core subject of this paper: information, and how we must conceive of it.

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[42] That such a structure of relations is necessary is highlighted by epistemic luck, for epistemic luck dismantles these mutual relations with only a pile of truths or a random list of pieces of semantic information as a result. (Floridi, Forthcoming, p. 16)

[43] For the justification of this approach and details (including the more formal details about Floridi's implementation of *network theory*) please see (Floridi, Forthcoming).

Veridical information, epistemic neutrality and normativity

One of the questions to answer in this paper is whether veridical information, like knowledge, must be understood to be normative in nature, requiring justification. Or that it can be hold to be neutral with respect to an epistemological position instead. As far as I have seen, Floridi does not provide us with a direct answer to this question. Therefore I will try to infer the answer based on the articles treated and on the analysis above.

The foregoing discussions made clear that veridical information does not require justification like knowledge does. But that does not make it neutral yet.

Non-neutrality in extracting data

As we have already seen, (DDD-)data and hence, semantic information are already epistemically loaded notions, for the data that constitute semantic information is dependent of the epistemologically relevant choices that make up the level of abstraction at which they are extracted. As Floridi says, these choices determine the ontological commitment of the theory (and of the analysis, model or observation). (Floridi, 2008b, pp. 19-20) This ontological commitment is incorporated in the data or semantic information. In this sense there obviously is epistemological "non-neutrality" in the step of extracting data or information from the system it is considered to be about.

Whether this epistemological non-neutrality must be considered to give rise to normativity is a question that still remains to be answered. But I think there are related issues that make this "non-neutrality" stand out even more, probably so strongly that it may be called normative indeed. To make that point, we have to examine Floridi's definition of information once more and investigate some of its consequences.

Semantic information and its locally privileged level of abstraction

According to Floridi's correctness theory of truth, a piece of semantic information comes with its accompanying CLP-settings; only with these CLP-variables set, it is determined what referent the information is about. (Floridi, 2010b, pp. 12-13) In this way Floridi expresses that there is just one level of abstraction associated with the piece of semantic information (besides context and purpose).

To get an impression of what this means, let us look in a more general fashion to interpretation of information. It seems natural to assume that the interpreter first recognizes a piece of information (he starts with holding something for a piece of information). And then he tries to interpret (or process) it some more, in order to unfold the meaning it seems to have; he tries to find a suitable or correct level of abstraction to apply. So we might say that in general, the interpreter has to answer the question at what level of abstraction the recognized piece of information is to be processed. But as we see in the case of semantic information, this question is considered to have a fixed answer. Semantic information is information that is considered to have one (fixed) appropriate level of abstraction[44]. The interpreter should use that level of abstraction or otherwise, his interpretation will be wrong.

We could also say that semantic information comes with a "locally privileged" level of abstraction. It is local because the level of abstraction is not meant to fit all possible pieces of information. Instead, it is associated with a particular piece of information (other pieces of semantic information can come with another level of abstraction). This level of abstraction is privileged because it is considered to be the uniquely appropriate one (for that particular piece of information). Because it is held to be the uniquely appropriate one, there is no discussion about which one to use, which makes it possible to simply speak of our interpretation as being correct or not.

So not only when extracting data or information, but also when interpreting or processing data or information, semantic information is not neutral, since it incorporates the "choice" for the accompanying level of abstraction that has been made (although one may not be aware of that). Note that when the levels of abstraction in both steps are the same, those two instances of non-neutrality might collapse into one. But since this need not be so in general (especially when also context and purpose are taken into consideration), it cannot be concluded that they always collapse into one source of non-neutrality.

[44] For matters of convenience, I won't mention the other parameters (context and purpose) each time, but this does not mean that they cannot be relevant.

The choice what model is granted the authority to ground correctness

I think that there is another sense in which veridical information cannot be considered to be neutral. To appreciate that, we have to take a look at Floridi's correctness theory of truth to understand better what it is that makes possible to test whether the information is correct.

For Floridi, the correctness of the information or "model under test" is grounded by testing it at the reference model. There are several paragraphs in his paper in which Floridi associates the testing (at the reference model) with "actual interaction to the system". At those occasions Floridi spends effort to emphasize that this forms an exogenous grounding for the model under test, and that this grounding "lives" in another (namely, the pragmatic) realm. (Floridi, 2010b, pp. 22, 24) In these occasions he seems to associate the role the model can play (as being under test or as being the reference model) with more or less fixed realms; as if semantic information can only be tested and thereby grounded by actual (pragmatic) interaction to the system, by which it might come suggested that there is no choice for grounding involved that has to be reflected upon.

But as we already have seen, in the end the grounding is done using another model or data set that is *granted* the authority to form the test. In his example of the beer in the fridge, Floridi's speaks about this point as taking the model under test as less fundamental than the reference model:

> "In our example, we take a propositional model ("the beer is in the fridge") as less fundamental than a perceptual model (e.g., the observable presence of beer in the fridge, or the grasping of some beer once the fridge is opened)." (Floridi, 2010b, p. 28)

This suggests that ultimately, it is not the type or even the difference in realm, but the acceptance of the authority of the reference model that makes it possible to consider the model under test as being grounded. In some passages, Floridi more directly suggests this. *"In CTT, truth is ultimately a matter of assessment of what is claimed to be the case against what is taken to be the case, (…)."* (Floridi, 2010b, p. 29) So given certain views on what can count as the most fundamental, the fact that the reference model can be associated with the pragmatic realm can count as a reason or justification for granting that reference model the authority to function as the oracle. But the crucial choice to make is about what model is

granted what authority. It is by virtue of that choice, that the model under test can be considered to be tested at all.

I could not extract from Floridi's article about CTT whether this choice (of which model is granted the authority to function as the reference model) can be derived from the specific values of the CLP-parameters that accompany the semantic information, or if it must be seen as an extra assumption that is external to the semantic information itself. Depending on that, this instance of non-neutrality might collapse with the one we encountered in interpreting information. Either way, this choice plays a crucial role in the constitution of correctness of information and therefore contributes to the normativity of veridical information. Simplifying, we can say that in the end veridicality entails a norm of correctness. In that sense, veridical information cannot be other than normative.

Altogether, the conclusion must be that, although veridical information need not be justified, it is always normative since it involves or presupposes a notion of correctness. Whether this must be seen as problematic or not will be treated in the next chapter.

Discussion

If we look at Floridi's approach to information from a distance, two main elements stand out. One main element is his epistemological levelism which is strongly tied to his diaphoric notion of data. The other main element is his data-based approach to semantic information and knowledge.

We have seen that Floridi's levelism is in many ways similar to Giere's perspectivism and that data, "standard" semantic information and veridical semantic information are perspectival in Giere's sense, and that knowledge might be perspectival too. Of the (various) issues that are raised by such an account, here a few of the most important will be discussed.

Normativity in semantic information

We have seen that semantic information cannot be considered to be epistemologically neutral. Instead, it is epistemologically substantial and normative, somewhat like knowledge, but it cannot be considered justified like knowledge. Expressed this way, as "unjustified normativity", it may sound suspect, but it need not be problematic. Floridi's notion of semantic information occupies the position in-between (justified) knowledge and "empty" propositions that we want from it. But at the same time, it does raise questions.

Floridi does not provide us with a story why or when it is acceptable for a level of abstraction to be accepted as the locally privileged one (with respect to a certain piece of information). Note that this is not provided by his informational account of (justification of) knowledge, because in that account, the different pieces of (veridical) semantic information account for each other while, on the other hand, the correctness of each individual piece of information itself is constituted by the locally privileged level of abstraction that seems to be "chosen" without explicit justification. This choice (what level of abstraction is the locally privileged one) is critical to the constitution of the correctness of semantic information, but it is not itself problematized. A similar point is that the choice what model is granted the authority to constitute a test of correctness, is not made explicit or reflected upon. This choice is not problematized in Floridi's framework either.

These conclusions can give rise to the idea that such a vision leads to a relativism or subjectivism, for it sounds as if the truth of veridical information depends on subjective choices. It could also be that the word "choice" I used above is unfortunate, and that it should be seen as a factor that will never turn out to be problematic. One way or the other, the fact that this "choice" or "factor" is critical to the constitution of the correctness of information means that we need a (philosophical) account of it, if we are to understand what it means that the information is true. Floridi's correctness theory of truth neither provides an explicit acknowledgement of the issues nor an attempt to address them, so he does not deliver us the needed account.

About the tenability of a data-based definition of information

Another issue with Floridi's approach is that the two main elements it is built upon – his epistemological levelism and his data-based approach to information – don't go well with each other. For if his epistemological levelism is not to be compromised, there are reasons that make his data-based approach to information seem problematic. To show why, we will dive in these issues in some more detail.

Data and semantic information are not fundamentally different

As we have seen, the notion dedomena – as the "true raw data" that some might want to assume as being the unmediated input of a perspective or a level of abstraction – is clearly different from the notions data and information. Unlike dedomena, both data and information already are a product of an analysis at a level of abstraction. This raises the question after the difference between data and semantic information. Is this difference fundamental enough to support a definition of information in terms of data?

According to the standard definition of information, the difference is that the data constituting semantic information is well-formed and meaningful while "bare DDD-data" is not. This looks clear enough, but if we discuss an example in some detail, we can see that there is more to it.

Let us consider a piece of data, residing on a hard disk, of which we only know it is named LUM and its size is 592KB. If we would be able to interpret it using the relevant format,

resolving the referent, we would be able to appreciate the London underground map, a nice example of semantic information. But we don't have the means to do that now. So we only stare at the characters "LUM" and "592KB" and we think that here we have a piece of data.

The interesting point now is that if we are to consider such a piece of data, we cannot go beyond the recognition of it being data (instead of being something other or nothing at all). And by only recognizing it to be data, we already have applied some level of abstraction that makes it possible to distinguish between data and other things (or to recognize data to be something at all). In fact, this is a piece of semantic information at a very "coarse" level of abstraction (only discriminating between data and not data).

This piece of semantic information seems uninteresting at best, but it shows that in practice, we cannot work with only data; at least two levels of abstraction are involved. The first level of abstraction may normally be taken for granted and neglected, but nevertheless, it enables us to recognize it as being data. At the same time, with that recognition, the expectation is settled that it will be possible to analyze the data at another level of abstraction such that the "full meaning" can be accessed, so that, for instance, we can find our way in the London tube system. Earlier we found that data, like semantic information, cannot be considered to be free of epistemic aspects. Now we find that data, like semantic information, is not free of semantic aspects either.

What this all shows, I think, is that the difference between data and semantic information is not fundamental. The difference can be reduced to the effects of analyzing it at different levels of abstraction. If this conclusion is correct, it means that there are serious problems with Floridi's data-based approach of information. For it means that data is both well-formed and meaningful, just like semantic information, only at another level of abstraction.

In both cases, in the recognition of something being data as well as in the appreciation of the "full semantic content", the very same thing seems to happen. A level of abstraction makes possible to discern contents according to it.

The level of abstraction is fundamental for data and information

The argument above shows, I think, not only that the difference between data and information is not fundamental, but also that the level of abstraction *is*. The level of abstraction is

fundamental for both data and information. Without it, we cannot speak of semantic information or (DDD-)data. Thanks to Floridi, the notion level of abstraction became emphasized in the literature about information. But both the standard definition of information and Floridi's revised version of it, completely ignore it in their formulation. There is no hint at the term "level of abstraction" in them. It is only via Floridi's conception of data that this point gets into the picture. But even then, it is not in both formulations of the Diaphoric Definition of Data itself. It is in his explanation of his notion of data that Floridi makes his point about levels of abstraction.[45]

Both the standard definition of information and the revised version are only about data and what must be added to get semantic information. The choice for such a structure suggests that the assumption is made that it is possible to account for data as something fundamentally different from semantic information. But, as a consequence of Floridi's levelism, this seems simply false. Instead, the notion *level of abstraction* is fundamental for both.

A data-based definition of information is not tenable as a philosophical notion of information

I believe that, given this epistemological levelism, a data-based account of information – even though it has proven to be convenient in various information system building practices – can, philosophically, not be considered tenable in its current form. For it suggests that information is built upon data, while data cannot be defined in different terms than information; there is no independent account of data. Instead, both depend on something else. And that is the level of abstraction, which happens to be fundamental for both but is not even mentioned in the data-based definition of information.

Simplifying, there are two solutions to this problem. Either the levelism can be dropped, or the data-based approach to information can be abandoned. With respect to the first option, it can be questioned whether it is possible to come up with a good alternative. Floridi's account of data (which is strongly tied to his levelism) seems to be the strongest up to date. To name a few of its plusses: it is generic (incorporating the informational, epistemic and computational interpretations of data), it is consistent with Shannon's theory of information (explaining the "laws" of data compression) and it accounts for at least some of the critique on naïve realist

[45] And obviously in the treatise on the method of levels of abstraction itself/ (Floridi, 2008b)

positions towards data. It is not easy to see how a completely different account can do better than this.

I think we should not forget that the data-based notion of information originated not from philosophical discussions, but rather from computer science. Seen in that light it may not come as a surprise that it cannot be used straight away as a philosophical notion, without thorough revision.

For all these reasons, I believe the second option – abandoning or at least thoroughly revising the data-based approach – must be considered the viable one.[46]

A sketch of a reinterpretation of data and information

If it is correct that there is no fundamental difference between data and semantic information, it might be better to use a more generic notion that can be considered to be fundamental to both. Here I will advance a preliminary sketch of such a notion, to get an impression of what it may amount to. I will call the notion simply *info*, to make it distinguishable from the other notions of information.

This notion *info* must be thought of as the core of DDD-data, environmental information and semantic information (in both "standard" and revised forms). In all these sorts of info, something is recognized by some agent as holding some content (consisting of distinctions) about some referent at some level(s) of abstraction (in some context for some purpose). Crucial concepts in such an approach are the notions info itself, the level of abstraction, the receiving (info processing) agent and the referent the info is considered to be about.

In such an approach, interpreting info (or receiving or processing info) always takes place at some level of abstraction. If no level of abstraction is considered to be privileged, one cannot speak of correct or incorrect interpretations; then there is simply "some" interpretation (or processing) of info. If some level of abstraction is considered to be (uniquely) privileged, as

[46] Obviously, it takes a lot more to substantiate such a claim. But I think it is enough to show that, within the scope of this paper, it is a valid choice to discuss options for solutions, while we continue to accept Floridi's levelism.

might be the case in semantic information, we can speak of correct or incorrect interpretations. If there are levels of abstractions that are considered to be more suitable with respect to a certain purpose, than we may speak of better or worse interpretations, as might be the case in environmental information in general, or in scientific information.

If communication is involved, one may add a (possibly intentional) sender to the picture and in some cases we might also speak of an intended level of abstraction (to be associated with the sent info). DDD-data can be understood to be info of which it is expected that more info can be appreciated if it will be interpreted using another (suitable) level of abstraction. Environmental information is info that comes without an intended level of abstraction, but for which a more or less suitable level of abstraction can be construed (depending on context and purpose). Finally, semantic information can be seen as information that comes with an (intended) privileged level of abstraction. If communication is involved and is to succeed, the levels of abstraction on both sides should conform.

This is what a preliminary, incomplete and rough sketch of a perspectival reinterpretation of data, information and communication might look like. I consider this view a form of perspectivism, with the idea that all info is perspectival as its central thesis. Nevertheless, I did not speak of perspectives here, for three reasons. First, by using Floridi's notion *level of abstraction*, both the differences and similarities with Floridi's view can be appreciated easier. Second, an analysis in terms of perspectives needs an account of the notion perspective and an explanation why that term is to be preferred over Floridi's level of abstraction. Both do not fall in the scope of this paper. Third, for this sketch, Floridi's level of abstraction is sufficiently close to the notion *perspective* I like to advance, so in this context it is possible to use it instead.

It will be clear that the approach sketched above needs considerable substantiation, which cannot be provided here. But bringing it up gives an idea in what direction we can find a solution for the problems with Floridi's notion of information. It gives some indications as to what such a solution amounts to. I think it has both major advantages and considerable challenges.

An obvious advantage is that the problems of data-based definitions of information are avoided while the advantages of Floridi's diaphoric definition of data and his

epistemological levelism are retained. Another advantage is that it is very general; it has the potential to explain what, for instance, data, environmental information and semantic information have in common. Further, using perspectives or levels of abstraction to explain these differences seems to be an interesting and fruitful approach, that can potentially yield new insights, which may be applicable in several fields. For instance, such an approach can describe (seemingly) very different processes in the same terms. One can think of both "fully subjective" impressions as well as objective truths as being perspectival, but the first are related to non-reproducible perspectives that occur only once to a single agent, while the second are related to widely shared, reproducible and (for many agents) proven to be useful perspectives.[47] Finally, even though a notion like semantic information is analyzed in other terms, it still can be rendered as a useful construct. It does not throw away insights, but it analyses it at another, arguably more fundamental, level.

Among the issues one may consider such a vision as being too close to relativism. Everything depends on what level of abstraction or perspective the analysis is conducted. And this idea is often taken to lead to the idea that we cannot arrive at universal truths, that every perspective (or level of abstraction) is as good as any other, that such a perspectivism refutes itself or that it should be considered untenable in the sense shown by Davidson's attack on conceptual schemes.

But in seeming vulnerable to objections like these, such a systematic perspectivism doesn't actually differ from, for instance, Giere's approach. And if my interpretation of Floridi's levelism is correct, it doesn't really differ in this respect from Floridi's approach either. In this paper, we have seen that both Giere and Floridi argue against "everything goes"

[47] Analyses in terms of info and with agents disjoint from their perspectives, thus yield many interesting possibilities. Differences in believes and knowledge of agents may for instance be analyzed in terms of the accessibility (and the reliability of the accessibility) of perspectives and also in terms of suitability of perspectives given some purpose and thus in terms of differences between the purposes agents (accept themselves to) have. Not only the information, but also the relation between the suitability of a perspective and a specific purpose can be understood to be objective because the agent and the perspective are decoupled. The approach also makes it possible to advance a very dynamic approach to interpretation, in which it is acknowledged that for instance human agents change perspectives all the time, but still hold roughly the same believes, because perspectives are revisited often and certain type of conclusions are drawn from some a specific (regularly revisited) perspective.

relativism or perspectivism. We have seen that Giere has pointed out that the self-refutation argument as formulated by Hales and Welshon (Hales & Welshon, 2000) begs the question, and does not harm his perspectivism. We have seen that there are good reasons to think that Floridi might be correct in arguing that his levelism is not harmed by Davidson's attack on conceptual schemes. And we have seen that, by decoupling agents from perspectives, it is possible to render information as being objective and in that sense universal, even though they are strictly bound to the associated perspective or level of abstraction.

Obviously, by making these points I don't want to suggest that these issues are now sorted out. Given the thorny nature of the problems and the fact that many, if not all, great thinkers have reached different conclusions about them, such a statement cannot be taken serious. But what I do want to suggest is that there is much to say in favor of such a levelistic or perspectivistic approach. Therefore, I think it cannot be considered acceptable to think of them as proven to be untenable or as simply nonproductive.

So although my preliminary reinterpretation of data and information may be considered controversial indeed, it nevertheless indicates an approach that seems to be a serious option in the debate and that seems to be capable of yielding many interesting insights.

The suitability of Floridi's notion of information as a fundament for the philosophy of information

The conclusion that Floridi's data-based notion of semantic information is not tenable as a philosophical notion can have profound consequences for his project of the philosophy of information. As we have seen, it leads to a reinterpretation of the notion of semantic information and consequently, it should lead to reinterpretation of (received) analyses that depend on the notion of semantic information. We cannot conduct such reinterpretations in the scope of this paper, but I think it is clear that the consequences for debates and subjects within the philosophy of information will be substantial.

An interesting question is if our findings also affect the scope of the philosophy of information. Floridi not only calls the question "What is information" the hardest and most central question in the philosophy of information. (Floridi, 2004b, p. 560) He also makes clear that the answer to this question demarcates the area of research of the field. (Floridi,

2002, p. 137) Regarding this question, Floridi spends the biggest effort in developing and advancing his notion of semantic information.[48] This might suggest that he takes his notion of semantic information as the demarcating notion for the philosophy of information. In that case, the conclusion that his notion of semantic information is not tenable, might have consequences for the scope of the field of the philosophy of information as well.

However, notwithstanding his emphasis on semantic information, he did not take that as the demarcating notion for the field. The scope he proposes is much wider than one based on semantic information alone, as can be seen in the questions he formulates as the fundamental and interesting open problems of the philosophy of information.[49] Floridi discerns several approaches to answer the question after the nature of information. The one that results in the data-based definition of semantic information (the semantic approach) is only one of them.

So the scope was broad already. Hence the consequences seem to be limited "only" to the various debates and subjects within the philosophy of information.

[48] Many of the articles in which Floridi does this are cited in this paper. There are others, in which Floridi's uses the results of these analyses. An example is his account of the logic of being informed, which is also based on his notion of (veridical) semantic information. (Floridi, 2006).

[49] See for instance the "data grounding problem" and the question whether an informational approach can solve the mind-body problem (Floridi, 2004b, pp. 564, 568)

Conclusion

We have seen that both data and "standard" semantic information are perspectival in Giere's sense. We found that the test that constitutes the correctness of semantic information is itself perspectival, and therefore veridical semantic information is perspectival as well. Altogether, the conclusion is that Floridi's levelism is similar to Giere's perspectivism in most aspects. The aspects in which Floridi's levelism differs, seem to be (worthy) refinements rather than structural disagreements.

We have also seen that veridical information is not neutral but that decisions play a role on several levels; decisions that are epistemologically substantial and determine ontological commitment. We found that veridical information is normative in character; it inevitably presupposes a notion and a norm of correctness. Floridi does not provide us with a philosophical account of this issue. I think this is an omission, for we need such an account if we are to understand what it entails to hold information to be true.[50]

Probably the most profound conclusion is that, given Floridi's epistemological levelism, his data-based definition of information is not tenable as a philosophical notion. This conclusion has significant consequences for the field of the philosophy of information. For it means that received analyses in the field should be reinterpreted in terms that do not suffer from the problems we found. Since we have also concluded that a notion of information is philosophically relevant indeed, we nevertheless should not give up Floridi's project of trying to establish a philosophical notion of information. Instead, the problems with Floridi's conception of information should be considered a reason to reopen the debate about such a conception and it should be considered a motivation to develop options that account for these problems.

We have seen that it is possible to advance an interesting option along the lines of Floridi's levelism and that takes the more general notion of *info* as fundamental and that still manages

[50] Note that the normativity of veridical information differs from that of knowledge in that only the latter entails a norm and account of when a belief or piece of information is considered to be justified.

to save the notion semantic information as a useful notion. This approach that I like to call a "systematic perspectivism", has several advantages. One obviously is that it conforms to all conclusions drawn above. Another is that it is very generic and seems to be quite powerful in that it is able to account for both subjective impressions as well as objective (but perspectival) truths in terms of the same notions. But it also faces a major challenge. For views like these are often attacked hard for they would lead to harmful relativism. Therefore I think it has to be shown in more detail how it manages to cope with the "threat of relativism". Giere's reply in which he shows that the self-refutation argument[51] doesn't pose problems for perspectivism, and Floridi's account in which he shows that Davidsons attack on conceptual schemes does not harm his levelism, should be substantiated and elaborated upon, to convince a larger part of the readers that an approach along these lines may be viable, consistent and fruitful. Although this work still has to be done, we have already seen several reasons that suggest that such an approach might be able to withstand these and also other often expressed objections.[52]

Altogether, I think that since Floridi's levelistic data-based conception of information is untenable, we should start a new chapter in the philosophical conceptualization of information. In that chapter, an approach like systematic perspectivism, to be developed along the lines of Floridi's levelism, seems to be ready to play a serious role. With respect to this, I think it should be noted that the "projects" of both Giere and Floridi are clearly not intended to make science look worse or to promote literature or poetry over science. Instead, they are meant to encourage being correct and precise (or scientific if you will), by trying to avoid the unconditionalized generalizations that lead to absolutistic claims. As Floridi says (when speaking about what counts as correct as dependent on the level of abstraction), *"This is not relativism, it is, for want of a better word, 'preciseism'."* (Floridi, 2010b, p. 33)

In this vein, Floridi's and Giere's work should be interpreted. It is about being aware of – and transparent about – the relevant conditions, commitments or assumptions, in order to enhance communication and avoid creating conceptual mess. As I see it, acknowledging that all

[51] as formulated by Hales and Welshon (Hales & Welshon, 2000)

[52] Other objections include the idea that perspectivism might lead to the idea that everything goes and the idea that it is not possible to claim objective or universal truth.

information is perspectival, is a very strong way (if not the strongest) to stay aware of this, and therefore, to commit oneself to contribute to enhancing communication, in both science and philosophy, and in personal life.

Bibliography

Austin, J. L. (1950). Truth. In J. O. Urmson, & G. J. Warnock, *Philosophical Papers* (pp. 117-133). Oxford: Oxford University Press.

Baghramian, M. (2004). *Relativism.* New York: Routledge.

Ballsun-Stanton, B., & Bunker, D. (2009). Philosophy of Data (PoD) and its Importance to the Discipline of Information Systems. *AMCIS Americas Conference on Information Systems.* AIS Electronic Library.

Bateson, G. (1979). *Mind and nature: A necessary unity.* New York: Dutton.

Bynum, T. W. (2005). Norbert Wiener's Vision: The Impact of the "Automatic Age" on OurMoral Lives. In R. J. Cavalier, *The Impact of the Internet on our Moral Lives* (pp. 11-26). New York: State University of New York.

Bynum, T. W. (2010). Philosophy in the Information Age. *Metaphilosophy*, 420-442.

Clark, M. (1990). *Nietzsche on Truth and Philosophy.* Cambridge: Cambridge University Press.

Dühr, S., Colomb, C., & Nadin, V. (2010). *European Spatial Planning and Territorial Cooperation.* New York: Routledge.

Dummett, M. (1993). *Origins of Analytical Philosophy.* London: Duckworth.

Dunn, J. M. (2008). Information in computer science. In J. Van Benthem, & P. Adriaans, *Handbook of the philosophy of information.* Amsterdam: Elsevier.

Floridi, L. (2002). What is the Philosophy of Information? *Metaphilosophy, 33*(1/2), 123-145.

Floridi, L. (2004a). On the Logical Insolvability of the Gettier Problem. *Synthese*, 61-79.

Floridi, L. (2004b). Open Problems in the Philosophy of Information. *Metaphilosophy, 35*(4), 554-582.

Floridi, L. (2005a). Semantic Conceptions of Information. In E. N. Zalta, *The Stanford Encyclopedia of Philosophy (Winter 2010 Edition).* URL = <http://plato.stanford.edu/archives/win2010/entries/information-semantic/>.

Floridi, L. (2005b). Is Semantic Information Meaningful Data? *Philosophy and Phenomenological Research, 70*(2), 351-370.

Floridi, L. (2006). The Logic of Being Informed. *Logique & Analyse, 49.196,* 433-460.

Floridi, L. (2007). In Defence of the Veridical Nature of Semantic Information. *European Journal of Technology and Human Interaction, 3*(3), 1-11.

Floridi, L. (2008a). Data. In W. A. Darity, *International Encyclopedia of the Social Sciences* (2 ed.). Detroit: Macmillan. Also available at: http://www.philosophyofinformation.net/publications/pdf/data.pdf, 2-14 (last accessed date: 2011/7/11).

Floridi, L. (2008b). The Method of Levels of Abstraction. *Minds and Machines, 18*(3), 303-329. Also available at: http://www.philosophyofinformation.net/publications/pdf/tmoa.pdf, 2-40 (last accessed date: 2011/7/11).

Floridi, L. (2009). Against Digital Ontology. *Synthese,* 151-178. Also available at: http://www.philosophyofinformation.net/publications/pdf/ado.pdf, 2-39 (last accessed date: 2011/7/11).

Floridi, L. (2010a). *Information: A Very Short Introduction.* Oxford: Oxford University Press.

Floridi, L. (2010b). Semantic Information and the Correctness Theory of Truth. *Erkenntnis,* 147-175. Also available at: http://www.philosophyofinformation.net/publications/pdf/siatctot.pdf, 2-43 (last accessed date: 2011/7/11).

Floridi, L. (2011). A Defence of Constructionism: Philosophy as Conceptual Engineering. *Metaphilosophy,* 282-304. Also available at: http://www.philosophyofinformation.net/publications/pdf/adofpace.pdf, 2-30 (last accessed date: 2011/7/11).

Floridi, L. (Forthcoming). Semantic Information and the Network Theory of Account. *Synthese,* Available at: http://www.philosophyofinformation.net/publications/pdf/siatntoa.pdf, 2-31 (last accessed date: 2011/7/11).

Gettier, E. (1963). Is Justified True Belief Knowledge? *Analysis, 23*, 121-123.

Giere, R. (1999). Using Models to Represent Reality. In L. Magnani, N. J. Nersessian, & P. Thagard, *Model-Based Reasoning in Scientific Discovery.* Dordrecht: Kluwer.

Giere, R. (2006). *Scientific Perspectivism.* Chicago: The University of Chicago Press.

Hales, S. D., & Welshon, R. (2000). *Nietzsche's Perspectivism.* Urbana: University of Illinois Press.

Lenski, W. (2010). Information: A Conceptual Investigation. *Information, 2010*(1), 74-118.

Palmquist, S. R. (1993). *Kant's system of perspectives: an architectonic interpretation of the critical philosophy.* New York: University Press of America.

Shannon, C. E., & Weaver, W. (1949). *The Mathematical Theory of Communication.* Urbana: University of Illinois Press.

Stalnaker, R. (1998). What Might Nonconceptual Content Be? *Philosophical Issues, 9*, 339-352.

Strawson, P. (1964). Identifying Reference and Truth-Value. *Theoria, 30*, 96-118.

Swoyer, C. (2008). Relativism. In E. N. Zalta, *The Stanford Encyclopedia of Philosophy (Winter 2008 Edition).* URL = <http://plato.stanford.edu/archives/win2008/entries/rlativism/>.

Wang, X. (2009). On Davidson's Refutation of Conceptual Schemes and Conceptual Relativism. *Pacific Philosophical Quaterly*, 140-164.