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Dichotomy or Continuum: Grice's Distinction Between Natural and Nonnatural Meaning

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Abstract

Grice (1957), in his theory of meaning, introduced a distinction between two different types of meaning: nonnatural meaning and natural meaning. Grice's distinction has been put to use in other areas of philosophy as well. Most famously, Dretske (1981, 1986) used Grice's distinction in his naturalized epistemology. Scarantino and Piccinini (2010) offered a probabilistic alternative for semantic theories of information based on Grice's distinction. In both Dretske's and Scarantino and Piccinini's works, Grice's distinction is assumed to form a dichotomy. This dichotomous nature, I claim, is at the root of some of the problems that afflict Dretske's information-based naturalized epistemology and Scarantino and Piccinini's probabilistic approach to information. In this paper, I suggest a revised version of Grice's distinction. In this revised version, instead of a dichotomy, natural and nonnatural meaning categories form a continuity, allowing overlapping and mixed intermediary categories between natural and nonnatural meaning. This continuous version, I further claim, provides more resources for avoiding some of the problems that afflict Dretske's naturalized epistemology and Scarantino and Piccinini's probabilistic approach to information.

Keywords: Naturalized Epistemology, Information, Non-natural meaning, Probability, Factivity principle

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İkililik mi, Süreklilik mi: Grice'in Doğal ve Doğal Olmayan Anlam Arasındaki Ayrımı

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Öz

Grice (1957), anlam teorisinde iki farklı anlam türü arasında bir ayrım ortaya koymuştur: doğal olmayan anlam ve doğal anlam. Grice'in ayrımı felsefenin diğer alanlarında da kullanılmıştır. En ünlüsü, Dretske (1981, 1986) Grice'in ayrımını doğallaştırılmış epistemolojisinde kullanmıştır. Scarantino ve Piccinini (2010), Grice'in ayrımına dayalı olarak bilginin semantik teorileri için olasılıkçı bir alternatif sunmuştur. Hem Dretske'nin hem de Scarantino ve Piccinini'nin çalışmalarında, Grice'in ayrımının bir ikilik oluşturduğu varsayılır. Bu ikilikli doğanın, Dretske'nin bilgiye dayalı doğallaştırılmış epistemolojisini ve Scarantino ve Piccinini'nin bilgiye olasılıkçı yaklaşımını etkileyen bazı sorunların kökeninde olduğunu iddia ediyorum. Bu makalede, Grice'in ayrımının gözden geçirilmiş bir versiyonunu öneriyorum. Bu revize edilmiş versiyonda, bir ikilik yerine, doğal ve doğal olmayan anlam kategorileri bir süreklilik oluşturur ve doğal ve doğal olmayan anlam arasında örtüşen ve karışık ara kategorilere izin verir. Bu sürekli versiyonun, Dretske'nin doğallaştırılmış epistemolojisini ve Scarantino ve Piccinini'nin bilgiye olasılıkçı yaklaşımını etkileyen bazı sorunlardan kaçınmak için daha fazla kaynak sağladığını da iddia ediyorum.

Anahtar Kelimeler: Doğallaştırılmış epistemoloji, Enformasyon, Doğal olmayan anlam, Olasılık, Olgusallık ilkesi

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Introduction

Grice (1957), in his theory of meaning, introduced a distinction between two different types of meaning: nonnatural meaning and natural meaning. In the former type, the meaning of a sign is determined through conventions. The conventional meaning of a sentence is an example of this type. In the latter type, the meaning of a sign is determined by nomic regularities between the sign and the signified. One classic example is the meaningful instance stated by the following sentence: "Those spots mean measles." The spots signify measles not because of a convention, but rather because of a physically reliable correlation between the spots and measles. Such instances of natural meaning are meant to be factual; that is to say, such natural instances have meaning only if they are truthful. Those particular spots mean measles only if measles is present. If not, those spots do not mean measles. This is the fundamental difference between natural and nonnatural meaning instances: the former has to be truthful, whereas the latter does not. The sentence "Julie arrived on Sunday." has conventional nonnatural meaning even when it is false. As a result, Grice understood the distinction between natural and nonnatural meaning as forming a dichotomy: a meaningful instance is either an instance of natural meaning or an instance of nonnatural meaning. Thus, for Grice, no mixed or overlapping intermediary category between natural and nonnatural meaning is allowed.

Besides his theory of meaning, Grice's distinction has been put to use in other areas of philosophy as well. Most famously, Dretske (1981, 1986) used Grice's distinction in his naturalized epistemology. Dretske constructed a semantic theory of information in which information is understood along the lines of Grice's natural meaning. He then used this notion of information for naturalizing mental content, belief, and knowledge. The notion of information that Dretske uses in his theory encapsulates truth. That is to say, information has to be truthful, because otherwise it is not information at all. Thus, information without truth is not allowed in his naturalized epistemology. This is a direct result of the factual nature of Grice's natural meaning. Since Dretske's notion of information is based on Grice's natural meaning, the factual nature of natural meaning transfers to Dretske's information as truth encapsulation.

In a *Metaphilosophy* article, Scarantino and Piccinini (2010) offered a probabilistic alternative for semantic theories of information. In their probabilistic alternative, they distinguish two types of information: natural information and nonnatural information. The former is understood along the

lines of Grice's natural meaning and the latter along the lines of Grice's nonnatural meaning. Contrary to mainstream semantic theories of information such as Dretske's, in Scarantino and Piccinini's probabilistic approach, information without truth is allowed. In other words, a signal may carry information that p even when p is false. Scarantino and Piccinini's probabilistic alternative is important because, as they rightly claim in their article, the main notions of information used in cognitive science and computer science require a probabilistic connection between information and truth.

In both Dretske's and Scarantino and Piccinini's works, the dichotomous nature of Grice's distinction is assumed without a close scrutiny. This dichotomous nature, I claim, is at the root of some of the problems that afflict Dretske's information-based naturalized epistemology and Scarantino and Piccinini's probabilistic approach to information. In this paper, I suggest a revised version of Grice's distinction. In this revised version, instead of a dichotomy, natural and nonnatural meaning categories form a continuity, allowing overlapping and mixed intermediary categories between natural and nonnatural meaning. This continuous version, I further claim, provides more resources for avoiding some of the problems that afflict Dretske's naturalized epistemology and Scarantino and Piccinini's probabilistic approach to information.

1. Dretske and the Gricean Distinction:

In his *Knowledge and the Flow of Information* (1981), Dretske attempts to provide an objective and naturalistic account of mental content and knowledge by explaining perceptual content, belief, and knowledge in terms of informational content. For this purpose, he defines the informational content of a signal and uses that definition to explain representational notions like 'seeing that,' 'believing that,' and 'knowing that.' His definition is as follows:

Informational Content: A signal r carries the information that s is F if and only if the conditional probability of s 's being F , given r (and k), is 1 (but, given k alone, less than 1) [k refers to background knowledge] (1981, s. 65).

Assigning unity to the conditional probability in the definition means that information has to be truthful. Any signal or message that is not truthful does not count as information. For Dretske, "false information and misinformation are not kinds of information—any more than decoy ducks and rubber ducks are kinds of ducks" (1981, s. 45). Many philosophers find this truth encapsulation requirement too demanding. Moreover, the truth encapsulation, i.e. the assigning of unity to the conditional probability in the defi-

dition, makes it impossible to explain false mental content. More often than not, our mental states misrepresent the external environment. Any theory of mental content should be able to explain such misrepresentation cases, but because of the truth encapsulation requirement, Dretske's framework fails to do so (Cummins 1991; Fodor 1992, 1994).

In an attempt to justify his truth encapsulation requirement, Dretske appeals to Paul Grice's distinction between natural meaning and nonnatural meaning. Natural meaning instances are factual, i.e. they refer to facts and are thus truthful. Dretske analyzes his informational content along the lines of Grice's natural meaning; he considers mental content and contents of propositional attitudes as similar to nonnatural meaning instances and tries to naturalize contents of mental states by reducing them to natural meaning instances. Since Grice's distinction serves an important function for Dretske's theory, especially for his truth encapsulation claim, a close scrutiny of the distinction is necessary.

The idea of natural meaning arises from natural signs. Natural signs have their meaning without any assistance from human beings. For example, the existence of an oasis means that there is water around, the direction of a shadow means that the sun is in the other direction, and so on. The main motivation of introducing natural meaning is to differentiate naturally occurring signs, which do not require any assistance from us, from nonnatural signs, which are formed through some sort of convention. Any natural language or any code of human communication is a good example of nonnatural signs and nonnatural meaning.

In Grice's original distinction, natural meaning instances imply the truth of the signified. To put it differently, if an occurrence means that p in a natural sense, then it is the case that p . This is called *the factivity principle* in Grice's terminology. A very commonly used example of the principle is the indicative relationship between 'red spots on the face' and 'having measles.' There is a lawful relation between red spots on the face and having measles. This lawful relationship is what constitutes the natural meaning of red spots. However, in some instances, red spots might be caused by other factors. In such situations, according to Grice, the symptom of having red spots loses its natural meaning. In other words, the red spots on Tommy's face mean_N that Tommy has measles only if Tommy really has measles (mean_N = means in a natural sense). In natural meaning instances, the relationship between a sign and the entity that is signified is one of indication.

Nonnatural meaning instances arise from nonnatural signs, to wit, signs that are created via some sort of convention. For example, the commonly known hand gesture made by forming a V with two fingers means 'peace,' and this meaning is acquired by convention. The conventional meaning of such a sign can change from one context to another. Besides such hand gestures, any natural language is also a result of conventions. The main characteristics of those nonnatural meaning instances is that they can go wrong; when one sees the V sign formed by two fingers, the sign may refer to something other than peace. In other words, nonnatural meaning instances do not obey the factivity principle. The relationship between a sign and the signified, in the case of nonnatural meaning, is one of representation.

Naturally, it is not enough to just propose the distinction between natural and nonnatural meaning instances; one also needs to offer a set of criteria by which the naturalness and nonnaturalness of a meaningful instance can be identified. For this purpose, Grice offers a twofold recognition test. For a sign X to mean r in a natural sense, the following two criteria must be satisfied (1989, s. 349):

- It should be the case that 'X means that r ' implies that r (the factivity principle).
- It should be possible to rephrase the assertion of meaning in the form 'The fact that X means that r ' (the quotability principle).

If a meaningful instance does not satisfy either one or both of these criteria, then it is a case of nonnatural meaning. The details of Grice's recognition test are not our main concern here. The only point is that such a test leads to a dichotomy. That is to say, a meaningful instance either falls under the category of natural meaning or it is a case of nonnatural meaning. This dichotomy of meaning is what Dretske borrowed from Grice, besides the original distinction itself.

The overarching goal of Dretske's project is to naturalize mental content. So, applying Grice's dichotomous distinction, he starts with the notion of natural meaning for defining his informational content. Since natural meaning instances obey the factivity principle, he puts the strong constraint of implying truth on this notion. This is the fundamental motivation behind assigning unity to conditional probabilities. Dretske then tries to explain mental content, which obviously falls under the category of nonnatural meaning since it does not obey the factivity principle, in terms of informational content that lacks any intermediary category (or any overlapping category for that matter). This is the biggest handicap, the lack of any intermediary or

overlapping category between natural and nonnatural meaning, that Dretske creates for himself.

The dichotomous analysis of meaningful instances proves to be crucial for Dretske's project, so it is only natural to ask whether it is satisfactory. A close scrutiny shows that there are two odd consequences of this dichotomy. The first is that it provides only particular natural meaning instances, to wit, it lacks a type-level meaning for natural signs. Secondly, the distinction is not exhaustive. The dichotomous natural versus nonnatural distinction is not capable of capturing some essential meaningful instances. Let me delve into these two consequences individually.

Following in Grice's footsteps, Dretske endorses the factivity principle of natural meaning, and this leads him to a particularistic account of meaning. Natural meaning is accepted only in particular instances. Let's take the example of red spots and measles. The particularistic account of meaning implies that there is no type-associated meaning of the symptom of having red spots on the face. We cannot talk about the meaning of having red spots on the face in a general sense. Whenever we talk about this symptom and its relation to measles, we should be talking about particular instances in which the person really has measles. Dretske clearly mentions this in his article "Misrepresentation."

In speaking of ... natural meaning I should always be understood as referring to particular events, states or conditions: this truck, those clouds, and that smoke (1986, s. 19).

Now imagine that you are looking at two people, Tommy and Alice. They both have red spots on their faces, but only Tommy has measles. The following three statements about this situation are compatible in Grice's dichotomous distinction, which Dretske endorses:

1. The red spots on Alice's face do not mean that she has measles.
2. The red spots on Tommy's face mean that he has measles.
3. Although the red spots on Tommy's face mean measles, having red spots as such does not mean measles.

Since one cannot speak of natural meaning instances in a general sense, there is no way of mentioning the connection between having red spots on the face and having measles in Tommy's case, unless one wants to claim that the connection between red spots and measles is a result of nonnatural mea-

ning, i.e. some sort of convention. Not only is this an odd result, but to accept all these three statements together, to say the least, is counter intuitive.

The second unacceptable result of the dualism of meaning is that some important cases of meanings are left out because they neither qualify for the category of natural meaning nor for the nonnatural meaning category. Denkel, in his *Reality & Meaning*, examines several examples that the Gricean dichotomous distinction fails to capture. The following three examples that I borrow from Denkel are sufficient to prove the point (1995, s. 186-190):

- A) That she has these spots on her skin means that she has the measles.
- B) The hair erection of this cat means that the animal is scared.
- C) The bark of that vervet monkey means that an eagle is approaching.

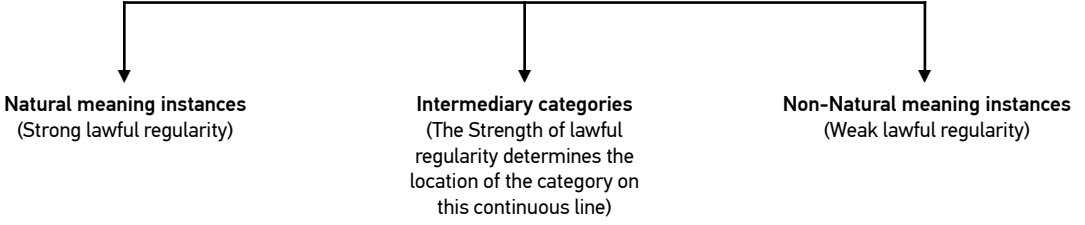
Intuitively, we are inclined to consider these three cases as cases of natural meaning. However, once Grice's twofold recognition test is applied to these cases, the situation becomes problematic because none of these meaningful statements satisfies the factivity principle. As mentioned above, in the Gricean framework and thereby in Dretske's understanding of natural meaning, it seems perfectly acceptable to say that "These spots mean measles, but actually she does not have measles." In a similar manner, the following are also acceptable: "The hair erection of this cat means that the animal is scared, but she is actually not scared since the erection is caused by the vet's chemical shot," and "The bark of that vervet monkey means that an eagle is approaching, but there is no eagle in the vicinity since the monkey is barking for the purpose of play with her friends."

Since the above examples fail to pass the recognition test for natural meaning, they will have to be categorized as nonnatural meaning instances. This option, however, is not acceptable, either, since there is no conventional apparatus involved in any of them. The result is that Grice's dichotomy is not capable of explaining these three meaningful instances. Moreover, the list of such examples could be increased by using examples from other areas, such as instinctive human communication. Hence, the dichotomous distinction is impoverished in terms of explaining meaningful instances.

These two unacceptable consequences are sufficient for the rejection of the dichotomous nature of the Gricean distinction, but they do not discredit the original distinction itself. The original distinction between natural and nonnatural meaning instances points out an essential difference between two types of meaning. So, the original distinction must be preserved by rejecting the dichotomy. A continuum between natural meaning instances and

nonnatural ones, which allows for the existence of intermediary and overlapping categories, seems to be a natural solution for the problem at hand. Such a continuous reading will keep the valuable distinction without falling into the trap of the dichotomy of two mutually exclusive poles.

It is clearly true that there are some natural signs that do their job, i.e. refer to their signified, without any human interference, and, moreover, they obey the factivity principle. It is also true that there are some communication systems in which the relationship between a sign and its signified is determined completely by conventions. However, it is equally true that there are several instances where neither the former nor the latter category seems to be a perfect fit. Such instances seem to be more of a mix of these two categories. The bark of a vervet monkey is a good example for such a mix. The meaning of the bark is nowhere close to being a result of convention, but on the other hand, it does not fully qualify as an instance of natural meaning, either. Hence, it seems very intuitive to claim that it is a mix of natural and nonnatural meaning types. The difference between the bark of a vervet monkey and a natural meaning instance seems to be the weak causal link between the bark and the existence of an eagle in the vicinity compared to the causal link between a natural sign and its signification, for example, the causal link between an oasis and the existence of water in the vicinity. On the other hand, the causal link between the vervet monkey's bark and its signification, i.e. the existence of an eagle in the vicinity, seems to be much stronger than the causal link between the V sign and the idea of peace. Thus, in terms of the strength of the causal link between a sign and its signification, natural meaning instances have the strongest ones, whereas nonnatural meaning instances have the weakest ones. This difference gives us a criterion by which one can identify the location of a meaningful instance on the continuous line between natural and nonnatural meaning instances. This idea could also be expressed in terms of the strength of the lawful regularity between a sign and its signification, instead of appealing to causality. The strongest lawful regularity happens in the case of fully natural meaning instances, whereas the weakest ones happen between fully nonnatural meaning instances. The Figure below summarizes this continuous reading of the original Gricean distinction.



As shown in the figure, there could be several different intermediary categories, since the strength of lawful regularity between a sign and its signification can vary along a wide range. Some examples of the intermediary categories are functions based on natural mechanisms and animal communicative behavior. This continuous version seems to be better than the original dichotomous version that led Dretske to the trap of assigning unity to conditional probabilities. Within the continuous reading, the conditional probability of a signified given the sign varies depending on the location of the meaningful instance between two ends of the line of meaning. In the case of strict natural meaning instances, the conditional probability of the signified given a sign is one. One example is helpful here:

$$P(\text{'the presence of water in the vicinity'} \mid \text{'an oasis'}) = 1.$$

It is clear that Dretske has such instances in mind for the definition of informational content. The value of conditional probabilities starts decreasing as soon as one leaves the strict cases of natural meaning instances. One example from the literature on biological functions is the following:

$$P(\text{'the presence of a fly'} \mid \text{'a frog's sticking out its tongue'}) < 1.$$

It is less than one, because, as it is well known by now, frogs stick out their tongues even when they see fly-like black dots.

It seems that the Dretskean framework would have more resources to deal with problems like misrepresentation if a continuous reading were accepted. Moreover, the continuous reading does not lead to unacceptable consequences, as in the case of the dualistic reading.

2. Scarantino and Piccinini and the Gricean Distinction

That information encapsulates truth has been a more or less generally accepted dictum since the early uses of information theoretic concepts in philosophy. Dretske's 1981 framework, discussed above, is the first example of this dictum being clearly formulated and defended as a fundamental thesis.

Floridi (2005, 2007), among several others, more or less followed the same reasoning and formulated the Veridicality Thesis:

(Veridicality Thesis) If a signal s being F carries natural information about an object o being G , then o is G .

The thesis implies that any nontruthful signal (or message) does not carry information, and thus, partial information, false information, and misinformation are not types of information at all. Because of the necessary connection between information and truth, such phrases refer to nothing but semantic junk. According to Scarantino and Piccinini (2010), such a consequence is at odds with the way the notion of information is used in empirical disciplines such as cognitive science and computer science. In these fields, they rightly claim, it is legitimate to allow a system to have information about the obtaining of p even when it is not the case that p . Thus, in their article "Information without Truth," they offer an alternative thesis for the relation between information and truth.

For Scarantino and Piccinini, the allure of the Veridicality Thesis is partly due to the lack of a distinction between two different notions of information: natural information and nonnatural information. The former is understood along the lines of Grice's natural meaning and the latter is understood along the lines of Grice's nonnatural meaning. If the informational content of a sign is a result of physical correlations, then it carries information naturally, and if the informational content is conventionally determined, then it is a case of nonnatural information. After establishing this fundamental distinction, Scarantino and Piccinini formulate a probabilistic thesis for each type of information separately. Their thesis for natural information is as follows:

(Probabilistic Thesis) If a signal s being F carries natural information about an object o being G , then $P(o \text{ is } G | s \text{ is } F)$ is greater than $P(o \text{ is } G | \text{not } (s \text{ is } F))$.

According to this thesis, a signal s in state F can carry information about an object being G even when the object is not G . It is sufficient for the signal s to increase the probability of the object being G compared to the probability of the object being not G . Scarantino and Piccinini formulate the same idea for nonnatural information as a separate thesis. The need for a separate thesis arises because natural and nonnatural information is sharply distinguished in Scarantino and Piccinini's approach. This sharp distinction is a result of the dichotomous nature of Grice's distinction.

According to Scarantino and Piccinini, the theory probabilistic notion of information is better suited for the way the notion of information is used in computer science and cognitive science. Their explanation of this rather pragmatic justification is quite satisfactory. Moreover, they successfully reject two main arguments offered in favor of the Veridicality Thesis by Floridi. Both the pragmatic justification and the successful rejection of two main arguments are good reasons for thinking that Scarantino and Piccinini's probabilistic approach is a step in the right direction. Understandably, their probabilistic approach is a first step, still in need of further improvement. Diagnosing the potential problems that may afflict the probabilistic approach and exploring the ways of overcoming such potential problems is essential for improving their probabilistic alternative. There are at least two potential problems that may afflict the probabilistic approach. I claim that these potential problems stem from the fact Scarantino and Piccinini's probabilistic approach is based on the dichotomous reading of the Gricean distinction. Once this dichotomous reading is replaced with the continuous reading explained above, it becomes easier to overcome those potential problems. Let me now explain those two potential problems.

The first problem is related to their notion of natural information, which is understood along the lines of Grice's natural meaning. As explained in the previous section, natural meaning instances that pass Grice's twofold recognition test are factual, and thus they are truthful. They cannot go wrong. Thus, Scarantino and Piccinini's claim of information without truth is not consistent with Grice's natural meaning. Given that Scarantino and Piccinini's natural information is based on Grice's natural meaning, their probabilistic thesis for natural information does not seem to hold ground. Another way of seeing this problem is through their interpretation of the notion of nonnatural information as used in cognitive science. They rightly state that "the notion of nonnatural information used in cognitive science is best interpreted as the notion of *representation*" (2010, s. 324). Since the notion of representation admits misrepresentation cases, their claim of information without truth is consistent with representation. The problem, however, is that they do not specify a corresponding cognitive science concept for their natural information. True, representation is the best interpretation of nonnatural information, but what is the corresponding notion for natural information? A close reading of the literature on philosophy of cognitive science would reveal that the notion that corresponds to natural information used in cognitive science is the notion of indication. That's why Dretske's framework, which is based on Grice's natural meaning, is called "indicator

semantics" (Dretske 1988; Hardcastle 1994; Slater 1994.) But if this is the case, then Scarantino and Piccinini's probabilistic thesis becomes false for natural information, because indication relations cannot go wrong. There are misrepresentation cases, but there are no "misindication" cases.

The second problem is related to their notion of nonnatural information. As they discuss in their paper, one may object that they already presuppose intentional content in their notion of nonnatural information. But the whole motivation behind using Grice's natural and nonnatural meaning in philosophy of mind and epistemology is to be able to naturalize intentional content, and presuming intentional content at the outset is not consistent with this motivation. Scarantino and Piccinini admit this; they say that the naturalization of intentional content needs to be done separately, and this is not their aim. Moreover, they also accept that their notion of nonnatural information is in need of naturalization: "...we explicitly distinguish between a notion of information that can help naturalize intentionality (natural information) and a notion of information that itself needs to be naturalized (nonnatural information)" (2010, 315). With this claim, which may seem harmless at first glance, we end up having two different naturalization projects, one for intentional content and one for Scarantino and Piccinini's nonnatural information. For the former naturalization, they suggest natural information as a helpful starting point, but for the latter, they say nothing. Needless to say, it is desirable to avoid this inflation in the number of naturalization projects, if possible.

These two problems do not stem from their probabilistic approach to information; rather, they stem from the dichotomy between natural and nonnatural information. Although Scarantino and Piccinini do not explicitly discuss the dichotomous nature of their distinction, the above discussion, as well as the following quote, strongly suggests that their distinction is dichotomous.

To make sense of natural and nonnatural information, we need different theories of information. We need a theory of the conditions under which signals carry natural information. We also need a theory of the conditions under which signals carry nonnatural information (2010, s. 327).

Scarantino and Piccinini's distinction inherits the dichotomous nature of Grice's dichotomy between natural and nonnatural meaning. Thus, if they adopt the continuous version of the Gricean distinction, explained above, their approach will have more resources to avoid the two aforementioned

problems. There would be no need to formulate a probabilistic thesis for natural information in such a framework. One probabilistic thesis for all information types, natural or nonnatural information, would be sufficient. Some cases of information will accept the truth encapsulation requirement, and these will be the ones that pass Grice's factivity test. The others will not require truth encapsulation because of the decrease in the lawful regularity between the sign and the signified, and Scarantino and Piccinini's claim of information without truth will be true for such cases. Moreover, because of the continuum between natural and nonnatural meaning, the naturalization of intentional content will also bring the naturalization of Scarantino and Piccinini's nonnatural information. Thus, the inflation of the naturalization projects mentioned above would be avoided.

Conclusion and Future Research

There is no doubt that Grice's distinction between natural meaning and non-natural is valuable in the quest for the naturalization of intentional content and meaning. It is also useful for clarifying and perhaps resolving debates about the relationship between information and truth. Accepting the distinction as a dichotomy, however, has problematic and unacceptable consequences. As I have shown above, in the contexts of Dretske's and Scarantino and Piccinini's works, instead of a dichotomy, a continuum between natural and nonnatural meaning provides more resources for dealing with associated problems. In such a continuum, mixed and overlapping instances of natural and nonnatural meaning are allowed, and the gradation among such instances is determined by the strength of the lawful regularity between the sign and the signified. As the strength of the regularity increases, meaningful instances get closer to natural meaning, which is the limit at one end where instances are factual and based on strict physical correlations. As the strength of the regularity decreases, meaningful instances get closer to nonnatural meaning, which is the limit at the other end where instances are not factual and are based on pure conventions.

The explanation that I have provided for the continuous version of the Gricean distinction is a qualitative one. Although this qualitative explanation portrays a clear picture of the continuous version of the distinction, a quantitative explanation, in which the categories of natural and nonnatural meaning are formally characterized, will definitely be better for understanding the dynamics of the continuum between these two categories. Such a formal analysis and explanation of the continuum is the next task that needs to be accomplished. In the literature on the Veridicality Thesis, a formal

analysis is provided for the conditions under which the thesis is true. This formal analysis goes as follows. As mentioned above, natural information, understood along the lines of purely natural meaning instances, obey the Veridicality Thesis (information encapsulates truth). For all the other instances, Scarantino and Piccinini's probabilistic thesis holds where information without truth is allowed. In the literature, it is proven that information carrying relations obey the Veridicality Thesis only if the informational chain has the Markov property. Informational chains that do not have this property do not lead to the truth encapsulation of information. This formal analysis may shed light on the dynamics of the continuum between natural and nonnatural meaning; it could give us the formal conditions by which purely natural meaning instances can be identified and distinguished from other meaningful instances. To combine these two different threads of discussion in the literature seems to have good potential for future research.

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