

# ARISTOTLE ON PERCEPTION AND UNIVERSALS: AN EXTENSIONAL READING

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## Abstract

This paper offers an extensional account of Aristotle's theory of perceptual content. To do so I make use of an extensional account of Aristotle's notion of universals and related notions. I argue that this view avoids certain problems recently posed by Caston (ms) by showing how it can accept a distinction between intrinsic and extrinsic perception. I also show how perception of individuals is related to knowledge and universals.

Keywords: extension, universals, perception, individuals, definition.

## Resumen

En este texto ofrezco una interpretación extensionista de la teoría del contenido perceptivo de Aristóteles. Para lograrlo hago uso de una explicación igualmente extensionista de la noción aristotélica de universal y otras relacionadas. Argumento que esta interpretación evita ciertos problemas recientemente descritos por Caston (ms) mostrando cómo puede dar lugar a la distinción entre percepción intrínseca y extrínseca. Ofrezco también una descripción de cómo la percepción de individuos se relaciona con el conocimiento y los universales.

Palabras clave: extensión, universales, percepción, individuos, definición.

This is a paper on perceptual content. More specifically, it is about Aristotle's doctrine of perceptual content. It has been discussed (Cashdollar (1973), and Everson (1997) among others) whether it requires intensional elements or not. In a recent paper Victor Caston (ms) possess a challenge against extensional readings, claiming that Aristotle's theory is problematic in a way in which

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only intensional notions can help. My goal in this paper is to argue against this claim.

There are several problems I will have to deal with. Aristotle accepts that animals perceive FOOD and PREDATORS,<sup>1</sup> but he also claims that the intrinsic objects of perception include only things like sounds, smells, colors, and magnitudes. I will need an extensional account of intrinsic and extrinsic perception to sort this out. Aristotle also seems to claim that perception is limited to particulars. Thus, it is not clear how it is that animals perceive something belonging to such a generic category such as PREDATOR. I will need an extensional account of perception according to which ‘perceiving *x*’ is understood in terms ‘perceiving *x* as *F*’ where *x* is an object and ‘*F*’ a predicate. I shall provide both these stories in section 1.

According to Caston (**ms**) we need Aristotle’s universals to play the role of the predicate. I think Caston is correct in claiming that universals take part in the story, although I believe they play a slightly different role (i.e., they appear in the analysis of the content of *thought*, not of perception). The relation between thought and perception is relevant here. Aristotle claims that only human animals can grasp universals, but he takes perception to be common to all animals. I try to make this clear in section 2. Still, universals do have a role to play in the story. In section 3 I try to explain how exactly it is that perception and universals are related.

The central issue of discussion, however, lies elsewhere. Caston believes we must understand the predicate in question and, thus, Aristotelian universals, intensionally. I believe Aristotelian universals are better understood within an extensional framework. I shall argue for this in section 4. Finally, section 5 is dedicated to clear out some doubts that may arise when dealing with extensional accounts.

## 1. Meeting Caston’s Challenge

According to the extensional account I have in mind a color, say RED, is the set or collection of things that have the relevant property in common, e.g., a collection of red things. This notion is particularly amiable with the claim that perception does not involve intensions,<sup>2</sup> and that perception can be of objects as falling under categories, i.e., that it is possible to perceive something

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<sup>1</sup> From now on I will use SMALL CAPS for both universals and concepts.

<sup>2</sup> This is particularly important if you, like me, dislike the ‘Spirit’ interpretation of Aristotle’s Theory of Perception, recently championed by Burnyeat (1992).

as RED. The question of whether universals are the content of perception will be answered in section 2.

Caston [ms] thinks that in order to account for perception as perception of  $x$  as  $F$  we need universals. This is not exactly correct. Aristotle's notion of universal is pretty limited. It does not apply to every category or every concept even.<sup>3</sup> Aristotle does not consider that GRAMMARIAN, for example, is a universal, even though he takes it to be a proprium of man. Something similar goes on with colors, smells, and sounds.

It seems that what we need is a more general idea. Discriminatory notions<sup>4</sup> such as RED, SWEET, and LOUD<sup>5</sup> will do the trick. As we will see, this is enough to account for intrinsic and extrinsic perception, as well as for misperception.

Let us go back to Caston's challenge. (1) We need perception to be closely related to discriminatory notions. What about perceiving individuals that are instances of them (i.e. members of the collection that the notion is)? This should be coupled with the idea that to perceive something, say  $x$  is to perceive it as being an  $F$ . As Caston points out, this account makes reference to the type of thing that is perceived.<sup>6</sup> But, it is still extensional since those types of things are assumed to be nothing but collections of individuals.<sup>7</sup> I shall defend this assumption in section 3. That's the extensional story of perception in terms of 'perceiving  $x$  as  $F$ '.

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<sup>3</sup> See Engmann (1978) and Kung (1977). These issues will be discussed later on (section 3) when I deal with the Intensional-view of universals.

<sup>4</sup> What I mean by 'discriminatory notions' will be clear in the following section.

<sup>5</sup> There are further reasons to think that a proper account of perception need not appeal to universals *in the way in which Caston thinks*. For Aristotle universals are objects of thought, and thought is what distinguishes humans from other animals. The way in which the human/animal divide is drawn suggests that this is a difference in kind. If we connect universals too closely with perception, we will have some trouble accounting for the divide. Caston is aware of this and makes important efforts to account for the divide in terms of other distinctions (e.g., between conceptual and non-conceptual content, or between 'perceiving' and 'perceiving of') that make his account more cumbersome and less convincing.

<sup>6</sup> Caston, [ms], p. 19

<sup>7</sup> Note that this view is not committed to something like Armstrong's (1978) view of universals, according to which a universal is wholly present in each of its instances. On my view, a member of a collection is not the collection, and the collection is certainly not wholly present in any individual member. All I am asking for is that the universal be such that one can perceive one of its members by perceiving a particular. See Irwin (1988) p.78ss for some reasons to think that Armstrong Universals are not Aristotelian.

(2) We need to distinguish proper from incidental cases of perception. Why not follow Caston's reading? Intrinsic objects of perception efficiently cause intrinsic perception, while the extrinsic ones efficiently cause extrinsic perception.<sup>8</sup>

INTRINSIC OBJECT OF PERCEPTION is defined relationally. For instance, an F is an intrinsic object of perception *for some sense modality M* if and only if x can be perceived by a subject S with that sense modality M, x is F, and x is an efficient cause of S's perception *in virtue of* it being an F.

Change the 'in virtue of being an F' part for 'in virtue of being a G' for some  $G \neq F$ , and you get the definition of EXTRINSIC OBJECT OF PERCEPTION. As you can see, there is nothing non-extensional here, for 'being an F' just means the same as 'being a member of a collection of F things'.

Finally, (3) can a purely extensional reading explain misperception? According to Caston, if we want to account for misperception "the structure of perceptual content, as it were, must show how perceptual error is possible."<sup>9</sup> Caston's solution consists in using notions like PERCEIVING AS or TAKING AS. I say we can take these notions and interpret them extensionally. Thus, to perceive something, say a book, as being blue, is for us to perceive it as a member of a collection, say of blue things. That is, roughly, the structure of perceptual content. This does not preclude misperception. One might be mistaken and perceive a member of a collection of green things as a member of a collection of blue things.<sup>10</sup> That is to say, one might perceive something green as blue.

An extensional reading can sort out the seemingly problematic features of Aristotle's theory of perception. It explains how animals, even though they perceive particulars, can perceive them as members of certain types. It also explains how animals perceive food by perceiving sounds, smells, and colors. All animals intrinsically perceive colors, sounds, and movement, but they also perceive food and predators extrinsically. All the extensional story needs is an extensional account of the predicates used in giving the content of perception, coupled with an account of INTRINSIC and EXTRINSIC PERCEPTION. I have borrowed the latter from Caston. The former will appear in section 3.

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<sup>8</sup> Caston (p.c.) objects that content can be more fine-grained on his view that on my view. I deal with this problem in section 4.2 below.

<sup>9</sup> Caston, [ms] p. 22

<sup>10</sup> Caston, [personal communication] objects that on my view animals have "a fairly sophisticated and abstract conceptual repertoire, more than some humans have, especially younger ones, much less animals". I deal with this problem in section 4.4 below.

This, however, is not enough to have an extensional account of Aristotelian perception. As we will see through this paper, Aristotle claims that, at least in one sense, perception is of universals, that perception supplies the intellect (which has universals as contents) with the necessary materials to operate, and that both perception and thought have analogous discriminatory capacities. Thus, whatever happens with thought, it must be similar to what goes on with perception. The following section is concerned with the relation between universals and perception in Aristotle.

## 2. Perceptual Content and Cognitive Development

On my view the fascinating last chapter of the *Posterior Analytics* deals with the problem of cognitive development.<sup>11</sup> The problem, famously known as Meno's problem, is that of learning. How do we manage to acquire knowledge? According to Aristotle, it must be that: (1) the universals (i.e., principles of knowledge) are not *already* there; and that (2) we do not fully lack them. It must be that we do have 'some principles, but always less detailed and useful than the ones we acquire'. Interestingly enough, Aristotle does think this faculty is common to all animals. 99b33-36 reads:

Necessarily, therefore, we have some capacity, but do not have one of a type which will be more valuable than these in respect of precision.

And *this* evidently belongs to all animals; for they have a connate discriminatory capacity, which is called perception.

De Haas (2005) points out that this discriminatory capacity is meant to play a central role in Aristotle's solution to Meno's problem. Among other features, it is supposed to be an *innate cognitive capacity* that is common to both, perception and thought, and hence, to all animals. Because of this innate capacity, it can be said that we already possess certain knowledge, although not "*in the same way and in the same respect* in which it is learned."<sup>12</sup> Cognitive development consists in refining the ways and respects in which we learn something.

De Haas also points out that this discriminatory capacity of the soul is rarely noted. It is generally accepted that sense perception, as presented in *On*

<sup>11</sup> From now on I will refer to Aristotle's work as it appears in the English translations I will be using. Complete reference to these translations appears in the reference section at the end of the text.

<sup>12</sup> de Haas, 2005, 324

the *Soul* II-III, has a *receptive capacity* (thus, accounting for the objectivity of perception). However, sense perception also has a *discriminatory capacity* (e.g., the eye discriminates red from green, the common sense between a color and a flavor). If this is to be the case, it must be that, say, the eye, is not merely affected by the color, but also that it parses out the information as belonging to a certain category (e.g. as green, and not as red). This same faculty is also able to divide and apprehend differences.<sup>13</sup>

De Haas claims that receiving and discriminating are one and the same event of perception. According to his account, the fact that perception can be destroyed when affected by an excessive input is evidence of this. For it is because no discrimination can be done when the balance, or *logos*, of the sense organ is lost, that perception itself is destroyed. On this view, “the event called perception is a meeting of *lógoi*, in which the received *lógos* is measured against the *lógos* of the organ.”<sup>14</sup>

That this is so is important for my purposes. In section 1, I presented a reading of Aristotle according to which to perceive is to perceive as. To perceive a color, for example, is to perceive as GREEN, RED, or what not. I then argued that GREEN, RED and else are extensions; thus, committing myself to the claim that to perceive something as, say, GREEN is to perceive it as a member of a collection. It is time to refine this account. What I want to claim about perception is that it discriminates the perceived objects by classifying them as members of different extensions. I do not intend to say that it is a process by means of which the animal is *aware* of the fact that the perceived object is a member of a particular extension. That would be tantamount to saying that to perceive as green just *is* to perceive *that* something is a member of the collection GREEN.<sup>15</sup> That is not the view I am defending.

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<sup>13</sup> This process plays a ‘crucial’ role in knowledge and understanding, which, presumably, is part of the discriminatory capacity of the *mind*, as opposed to *sense perception*. De Haas points out that the differentia is ‘the crucial part’ of the definition. See de Haas, 2005, 327-28

<sup>14</sup> *Ibid*, 336

<sup>15</sup> The distinction I want to draw here can be cashed out with the following example. Suppose that something like Gopnik’s theory of causal learning is true. If so, then whenever you perceive, say, as if it is raining, it is the case that your brain includes this information within a Bayesian net, where rain takes a node and is connected with other important pieces of information. For that to be the case, the human brain must be able to “use unconscious inductive procedures that allow them to infer causal representations of the world from patterns of events, including interventions.” Gopnik, et.al, 2004, p 4. Hence, when you perceive you perceive the rain as part of a causal map. This,

All I need is that perception be such that it classifies the objects of perception in different groups. Whether or not the animal is also aware of these groupings is immaterial. The view I defend is consistent with the claim that to perceive differentially just is to *respond differentially* to things in different categories. But it is also consistent with a stronger view according to which some *representational* ability takes place, though one that consists mainly of first-order representations. Thus, even though the animal may represent an object perceptually, it need not represent that it represents an object. There's nothing wrong in a representational mind that uses certain constructs to represent the world without representing those structures themselves (see Margolis and Laurence (1999), for some options here). Once we get this classification we can go on and claim that it is consistent with an extensional account of perception, according to which those groups above are extensions.

Yet, the discriminatory disposition of the sense organs is just the starting point. To get a better idea of the role it plays in the broader cognitive machinery, as well as to properly understand the differences between perceptual and intellectual discrimination,<sup>16</sup> we must take a look at Aristotle's doctrine of cognitive development, which is presented in four steps: first, perceptual discrimination; second, retention of the percept; third, repeated retention and retrieval; and, fourth, knowledge.

We have seen what the initial step is about. An important difference comes about, says *Post. An.* 99b37-100a1,<sup>17</sup> for animals that can in fact retain the discriminated percept. Memory turns out to be central for differentiating perceptual from intellectual cognition.<sup>18</sup> It plays two important roles: it is a storage device and, most importantly, a retrieval device. Memory as storage, however, does not come hand in hand with perceptual discrimination. According to

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however, is far away from claiming that to perceive as if it is raining is to be aware of such causal maps, or probability nets, such that you also perceive that there is such and such probability that you'll get wet.

<sup>16</sup> This is tantamount to understand the difference between human and animal cognition.

<sup>17</sup> "And if perception is present in them, in some animals retention of the percept comes about, there is no knowledge outside perceiving (either none at all, or none with regard to that of which there is no retention); but for some perceivers, it is possible to grasp it in their minds." *Post. An.* 99b37a-100a1.

<sup>18</sup> Thus, memory plays a constitutive part of the nature of thought. In fact, it illuminates how it is that subjects can go from perception to knowledge of universals and, hence, how explanations come to fore. For more on this see pages 8 through 15 and especially footnote 24. I owe this mention to an anonymous referee.

Aristotle some animals may have the latter without the former. That is an initial difference between perception and thought and, thus, between humans and other animals.

The third step presents further differences. The stored perceptual experience, call it ‘a memory’, takes a stand in the mind as primitive form of a universal (*Post. An.* 100a15-16). Several memories (100a3-9) ‘form a single experience’. Thus, the storage capacity gives place to a second important difference: some animals are able to have experience of the environment, others do not. This is an important distinction, given that experience constitutes a position of cognitive strength. The universal in the mind is no longer primitive; even the whole of it (100a5-6) may come to rest in the mind. This allows the animal to retrieve its memories. Retrieval, however, is a voluntary process. If the animal does retrieve its memories, the fourth and final step will be reached.

Once we have enough number of memories to form an experience “there comes a principle of skill and of understanding” (100a7-8). If the animal does in fact retrieve this experience, or principle, it will have either skill – for how things come about – or understanding – for what is the case. Storage, repeated memories, and retrieval give place to knowledge and understanding. All of them, however, are independent of perceptual discrimination.

It is important to note other important differences between thought and perception. Both, intellectual and perceptual discrimination are dispositions for Aristotle. Perceptual dispositions are of the sense organs, and are given or innate. They constitute the logos, or middle point, of each organ. Hence, they cannot be revised, or changed. Intellectual dispositions, however, are not given, nor innate. They also constitute the logos of the mind, but they are acquired, voluntarily exercised and revisable. “Unlike the perceptual mean, the intellectual mean is continuously modified as knowledge increases.”<sup>19</sup> Image retrieval is a voluntary process. One can, in fact, control, exercise, and improve its own intellectual discrimination. Perception, however, is an unconscious, involuntary process (*On the Soul* II.5 417b17-28). And yet intellectual discrimination depends upon perceptual discrimination.<sup>20</sup> Without stored images there is no retrieving, and, thus, no explanation, learning, or knowledge. This should be enough to alleviate my proposal from the charge that, according to it, the hu-

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<sup>19</sup> Ibid, 341.

<sup>20</sup> As de Haas puts it, the discriminatory disposition of the mind “only comes to be after sense perception has supplied images (*φαντασµατα*) on which it can operate.” See de Haas, 2005, 340-342

man/animal distinction, which for Aristotle seems to imply a difference in kind, ends up being a matter of degrees.

The extensional account is committed to the claim that the content of perception is extensionally defined, and that it is sufficiently analogous with the content of thought, which can be of universals. I have assumed that universals are better understood as extensions. Hence, the analogy stands because both, perceptual and intellectual content, are extensionally defined.

'Sufficiently analogous', however, does not mean 'of the same kind'. Perceptual content is *of particulars as falling under general classifications*, whereas intellectual content is of those general notions. You can think of all men and no one in particular, but you cannot but perceive particular men. Furthermore, if the animal lacks the mnemonic capacities above mentioned, its perceptual content cannot constitute anything close to the content of a thought. Intellectual content is not a mere matter of more perceptual experiences. Without storage and retrieval, the animal may keep on receiving the same perceptual input without learning anything. Thus, an important difference arises: universals *actually* are, in some cases at least, the contents of thought; whereas they never *actually* constitute the content of perception.

Let me put it a bit loosely. Perception groups percepts in different extensions. Such is the content of perception. Memory stores these percepts, and thought discriminates among them by revising them. There is knowledge when the human is able to properly discriminate between the stored images by grouping them within the proper extensions and, therefore, grasping what the relevant extension is. This more finely discriminated distribution is the content of thought. This is how, roughly speaking, a universal becomes the content of a thought and, thus, a useful tool for understanding and explanation. Perceptual discrimination is a necessary initial step; but it does not take us far away by itself.<sup>21</sup> The difference is important, for only an adequate discrimination will give place to adequate relations among (extensional) representations thus giving place to knowledge. It's not, then a mere difference of degree. For such a difference in discrimination becomes a qualitative one.

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<sup>21</sup> If you wish to save the elite term 'concept' for thought processes, and so equate universals in terms of concepts, then you can accept that perception is not conceptual, and still keep the extensional account. I doubt, however, that there is something more than a terminological battle between the 'conceptual' and 'non-conceptual' distinctions, at least with respect to Aristotle's theory. After all, perceptual content must be close enough to intellectual content for the latter to be possible. If so, then non-conceptual content ends up being 'close enough' to conceptual content.

So far I have given two reasons to expect perceptual content to be similar to that of thought. Perception is the starting point which supplies thought with the necessary material; and both, perception and thought, are discriminatory faculties. Whether or not we need universals to play a role in the analysis of perceptual content depends on how Aristotle takes perception and universals to be related.

### 3. Perception and Universals

It is commonly believed that, for Aristotle, universals have nothing to do with perception. Even extensionalist interpretations seem to agree on this. Lloyd (1981),<sup>22</sup> for example, claims that Universals are classes or extensions of objects; but he also claims they are objects of thought. He does not say that they are *exclusively* so, although he says close to nothing about universals in relation with perception. I believe this is misguided. Universals play an important role in Aristotle's theory of perception, in so far as perception plays an important role in Aristotle's doctrine of cognitive development.

According to Lloyd, Aristotle's theory of forms claims that "a form of X-without-its-matter is X-thought, which is X-generalized or the class of X. At the same time all these are only X's-thought, modes of awareness of X, or even modes of presentation of X to our awareness."<sup>23</sup> This account is particularly reminiscent of *Metaphysics* Z 1036b3-6, according to which one must abstract the form in order to understand. It also reminds us of Aristotle's own definition of perception. *On the Soul* II 12 tells us that to perceive is to receive the form without the matter. Thus, if *Post. An.* II 19 shows that abstracted forms are universals then it also shows that perception itself must be at least one way in which the animal can grasp the universal.<sup>24</sup> Different passages suggest that this is the case.

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<sup>22</sup> Lloyd (1981) holds a 'conceptualist' interpretation of universals in Aristotle. According to this view, universals are not *in re* but *post re in re fundatio*. Lloyd's main claim is that Aristotle's ontology distinguishes between forms and universals. The former are particulars, the latter are not. This, together with the claim that only particular substances are real, allows him to argue that universals are not real in this sense, but 'creatures of thought'. Aristotelian universals are concepts, according to Lloyd.

<sup>23</sup> *Ibid.*, p.15

<sup>24</sup> This is particularly important, since it explains how it is that animals in fact perceive predators and food, not just colors and movement. Briefly put, if Lloyd (1981) is correct about *Post. An.* II.19, then according to *On the Soul* II.12 animals perceive objects as falling under universals, by definition.

*Post. An.* I.31, for example, claims that all perception is of particulars, not of universals; and that no knowledge is achieved only by means of perception. The chapter, however, can be confusing. Aristotle also accepts that one can grasp a universal by ‘observing repeated instances’ of it [*Post. An.* I.31 88a3-57] because ‘it is from the repetition of particular experiences that we obtain our view of the universal.’

When read carefully, however, the passage is quite clear. In claiming that one obtains the universals through perception, Aristotle is *not* accepting that universals are perceived. Rather, he is claiming something weaker; i.e., that perception has something to do with the acquisition of universals. If you take universals as extensions, as I propose, things get clearer. You cannot perceive the extension of all red objects. Nonetheless, you can in fact perceive each one of the members individually. After perceiving many red particulars, storing and retrieving the relevant images, you get an idea of the extension of all red objects.<sup>25</sup> And yet, perception is of *particulars* as RED, not of the universal RED.

So what is the relation with knowledge, then? There is no knowledge through perception, because knowledge requires explanation, and no explanation can be exclusively derived from any *particular* case. For Aristotle *universals* go hand in hand with definitions, since they reveal the essence of particulars. Not surprisingly, they have explanatory power; therefore becoming necessary for knowledge. The doctor knows that this beverage will cure Callias from that malady, because she knows that *in general* drinking the beverage cures the malady. Even though we may grasp a universal *by means of* perception, that only makes of perception a necessary element in the equation. Perception itself does not give us an explanation of the perceptual experience. For that we need thought, which presupposes perception and employs universals.

Nonetheless, Aristotle considers that these features of perception might be said to be limitations or failures. It is not difficult to conceive cases where one can perceive what happens, or see the explanation. According to *Post. An.* I.31 88a13-15 ‘it is not that we know by seeing, but rather that we have [or possess] the universal from seeing.’<sup>26</sup> Given what the previous passage says,

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<sup>25</sup> A fair question arises: If universals are just collections, how do we grasp universals without having in mind *all* the members of the extension? Two important resources seem to pave the road here: memory and imagination. The former allows us to have in mind and retrieve the perceived instances, imagination allows us to complete the picture based on the retrieved information.

<sup>26</sup> Here I follow Caston’s translation. Tredennick’s version reads: ‘not because we know a thing by seeing it, but because seeing it enables us to grasp the universal.’

it makes sense to think that by ‘having or possessing a universal from perception’ Aristotle means that we can possess a universal from repeated perceptual experiences. That this is so is clarified by the example.<sup>27</sup>

If we could see the channels of the burning glass and the light passing through, it would also be obvious why it burns; because we should see the effect severally in each particular instance, and appreciate at the same time that this is what happens in every case. *Post. An.* I.3188a15-18

The passage does not state that by seeing one single case, one can *ipso facto* grasp a universal or gain knowledge. Rather, it says that we could gain knowledge through perception if only we could see why all instances are such and such, by merely seeing this particular instance. We would thereby gain knowledge not in virtue of this particular instance alone, but because this should allow us to see how every particular instance goes.

There is no knowledge of a single particular, just like there is no grasp of a universal if all you can perceive is one single instance. Thus, even though we perceive particulars, we can grasp universals *through* perception in so far as we *can* perceive each particular instance. As Aristotle says, the repetition of particular perceptual experiences gives us a *view* of the universal. That is how perception plays a role in the acquisition of knowledge.<sup>28</sup> Very roughly, this is one way in which perception and universals relate to each other.

This suggests that it is the universal, and not the particulars, that explains why, for example, the glass is burning. But things are more complex. Universals are needed for knowledge, but also particulars. Caston (**ms**) claims that, at some points Aristotle appears to be inconsistent. In *Post. An.* I.18 [81b6] he claims that “of particulars there is perception”, but not of universals. In *Post An* I.31 [87b29-30] he claims “perception is of what is such and such, and not of individuals.” Further more, in *Post. An.* II.19 [100a16-b1] he says, “even though one perceives the particular perception is of the universal – e.g., of man but not of Callias the man).” Caston takes these claims to suggest a differen-

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<sup>27</sup> If one can grasp a universal without encountering the whole extension, couldn't one also grasp it without having to encounter more than one member? The answer is no, and the reason is simple: the mind cannot (to put it somehow) *generalize* from a single encounter for a single encounter does not exhibit what is to be in common among the members of the extension.

<sup>28</sup> According to Modrak (2001), perception plays a central role in supplying thought and knowledge with the necessary materials.

tiated treatment of the expression “perceiving x”.<sup>29</sup> If we take “perceiving” to be used in the same way, then perception cannot be both of particulars and of universals.

Now, if Caston is correct then there is more trouble than this apparent inconsistency. For if Aristotle admits that one perceives universals in the same way as particulars then the extensional account seems to be off-place. Otherwise Aristotle would be claiming that when we perceive, say red, we perceive the whole collection of red things. This is certainly odd, if not just mistaken. I think, however, that Aristotle is not being inconsistent; that the sense in which it is said that universals and particulars are perceived is different in each case; and that this distinction fits better within the extensional account.

In *Metaphysics* M Aristotle claims that universals must be both, different and not-separate, from particulars. This view is consistent with the existential dependence of universals upon particulars that Aristotle presents in the *Categories*.<sup>30</sup> His complaint is that, if one separates universals from particulars, like Platonic ideas, there is no available account of knowledge. For knowledge is of universals and all we actually perceive are particulars. Thus, no knowledge would be attained. Needless to say, this view fits within the extensional account.

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<sup>29</sup> Caston’s solution consists in distinguishing between ‘perceiving x’ and ‘perceiving of x’. I think we do need some such solution, but I doubt that this one is well motivated. For Caston also seems to think that the difference between *Post. An.* I.31 and *Post. An.* II.19 is just a matter of emphasis. I think this is not well supported by the text.

First, Aristotle does seem to use ‘perceiving x’ and ‘perceiving of x’ indifferently in these passages. At least, that is what the passage in 81b6 suggests. Thus, the distinction that Caston is trying to draw between perception of particulars and perception of universals does not seem to be anywhere.

Second, the claim that the difference between 87b29-30 and 100a16-b1 is a merely a matter of emphasis, does not seem to have support. According to Caston, the passages only differ in their argumentative goals. *Post. An.* I.31 intends to show that perception is not sufficient for knowledge, while *Post. An.* II.19 intends to show that it is necessary. I doubt, however, that the latter is the argumentative goal of *Post. An.* II.19. In *Post. An.* I.18 we already have an argument that shows that perception is necessary for knowledge. Aristotle does not need to settle the necessity of perception once more. That would make of *Post. An.* II.19 a redundant chapter. In Caston’s reading, the latter has the extra function of “explaining in detail” the necessity of perception. This may take out some redundancy but it wouldn’t explain why *Post. An.* II.19 seems to be concerned with a fairly different goal: the problem of cognitive development. It seems clear that Aristotle’s goal here is an explanation of how knowledge develops.

<sup>30</sup> For more on this see section 4.

A class is not identical with any of its members, and yet there is no class apart from its members.<sup>31</sup>

That said, Aristotle goes on to give us a solution to our problems. *Metaphysics* M 1087a6-28 states that the claim that knowledge is of universals is said in two senses.

For knowledge, like knowing, is spoken of in two ways – as potential and as actual. The potentiality, being, as matter, universal and indefinite, deals with the universal and indefinite; but the actuality, being definite, deals with a definite object, - being a ‘this’, it deals with a ‘this’. But *per accidens* sight sees universal colour, because this individual colour which it sees is colour; and this individual a which the grammarian investigates is an a. [1087 12-25]

Similarly, we should say that, in actuality, perception is of particulars and not of universals (e.g., when I see a blue book I do not see the set of all blue things or the set of all books). This is the sense used in *Post. An.* I.31. However, in potentiality, perception is of universals. I am *able* to perceive all blue things and, since universals are classes, I am able to perceive the universal blue. Furthermore, when I perceive a blue book, what I perceive is *per accidens* a blue thing, i.e., a member of the universal BLUE. This is the sense of *Post. An.* II.19. If this is so, then there is no inconsistency in saying that perception is (actually) of particulars and (potentially and *per accidens*) of universals.

This distinction between types of knowledge associated to universals and particulars offers a better interpretation of the passage in *Post. An.* I.3188a15-18 (see page 14). The explanation of why this glass is burning corresponds to actual knowledge (and thus is associated with the perception of that particular instance), whereas the appreciation of the generality that covers all cases seems to correspond to potential knowledge (and thus is associated with the understanding of universals). It is important to notice, however, that one cannot get one without the other.<sup>32</sup>

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<sup>31</sup> There is no need to worry about singleton cases. Apparently, Aristotle accepts that even though the actual sun is a particular and so indefinable (*Z* 15, 1040a28-29) it nevertheless instantiates a type, which is general. This only makes sense once we, like Aristotle, accept that there *could* be another sun and, hence, that in *potentiality* there is more than one sun. As I will show later on, a proper understanding of universals includes actual and potential members.

<sup>32</sup> This helps explain why even if, as I will argue in the following section, universals are not an efficient cause they are still relevant to explain, for example, why a particular

One might think that a similar story is also available for opposing views. However, I think that the distinction between potential and actual senses of ‘perceiving something’ is not so helpful for them. The property-view, on the one hand, is committed to the existence of universals within particulars. If that is true then one should be able to actually perceive a universal (i.e., an object’s property) by actually perceiving a particular.<sup>33</sup> But this is just what Aristotle denies. The intensional view, on the other hand, is committed to the separate existence of the intension. Hence, the distinction between actually perceiving some members of the extension and potentially perceiving all of them is not useful. All one would need to perceive the universal would be to perceive the intension (whatever that might be). If so, then Aristotle would be claiming that perception of intensions is only potential. What I am wondering now is, how are we supposed to (even potentially) perceive intensions? It seems that the intensional view owes us, at least, a bit of a story here.

This seems like a fairly detailed account of perception and its relation with universals. It is also explicitly consistent with an extensional account of perceptual content. However, life is never that easy. If what I say is to be of any use, there better be good reasons to think that Aristotle would buy my assumption according to which universals are extensionally understood. If universals (i.e., the contents of thought) are not extensions, then it is not clear why perceptual content should be. This is difficult, especially given that there is no ancient set theory, and (according to Caston [*pers. comm.*]) there is, allegedly, no explicit claim of Aristotle’s whereby he presents universals as collections. This is unfortunate.

But life is also never that difficult. There seems to be no agreement among scholars<sup>34</sup> as to what Aristotle explicitly means by ‘universal’. All that scholars seem to agree on (i.e., that universals are not particulars) is inconclusive for my purposes (i.e., whether universals can be extensionally understood). So there

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glass is burning. It is particulars that constitute an efficient cause and the explanation is associated with actual knowledge. But there is no actual knowledge without an understanding of universals. Thanks to an anonymous referee for underscoring this point.

<sup>33</sup> The property view cannot simply claim that what one perceives is not the universal itself, but a particular as being a certain sort of thing or exemplifying a kind. The reason is simple: the claim that the universal *is present* in the particular (the defining claim of the property view) will be true depending on how true it is that the universal is what one perceives. If one doesn’t perceive the universal itself, then the universal itself is not present. If one perceives, say, a thing that exemplifies a kind then it is that exemplification of the kind that is present, not the kind.

<sup>34</sup> See Cohen (2003) especially section 10, and Gill (2005)

seems to be room for my claims. I shall be satisfied if I can show that my view is compatible with what Aristotle has to say on universals. This, I take it, is enough to show that one need not appeal to non-extensional notions, like intensions, to have Aristotle proper. This is fortunate.

In the following section I shall provide an extensional reading of Aristotle on universals.

#### 4. Notes on Universals in Aristotle

I support my claim that Aristotelian universals are extensions upon five different characteristics that Aristotle takes them to have. According to Aristotle, universals are predicates, their existence depends upon that of particulars, they require actual instantiation, they are *not* causally efficacious, and, last but not least, they contain particulars (like extensions contain their members).

The evidence comes from *On Interpretation*, *Categories*, and *Metaphysics*.<sup>35</sup> I am fully aware that there is more evidence to consider and that the evidence I present might be controversial. But there is no way around this when dealing with Aristotle. There are many battlefields within Aristotelian scholarship. That of universals is one of the muddiest ones, according to some. Allow me then to first present my weapons, if only to see, later on, how well can I scuffle by means of them.

Aristotle's grammatical definition of universals is perhaps the most widely accepted one.

Now of actual things some are universal, others particular (I call universal that which is by its nature predicated of a number of things, and particular that which is not; man, for instance, is a universal, Callias a particular). So it must sometimes be of a universal that one states that something holds or does not, sometimes of a particular. *De Interpretatione* 17a37-17b3

There are many different claims in this passage. First, we have the universal/particular distinction. We then get universals as predicates, something which is 'by nature predicated of a number of things'. This does not mean, however, that everything that is a subject will be a particular. Universals are

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<sup>35</sup> This is not to say, obviously, that there is no more evidence to analyze. As we will see in further sections, other substantial evidence is to be found in *On the Soul* and *Posterior Analytics*.

grammatical predicates of singular propositions (e.g., Callias is a man) and grammatical subjects of generics (e.g. 'Every man is white' 17b6, and 'a man is white' 17a10). Aristotle seems to adhere to this account in *Metaphysics* Z.10 1035b-27-28.

This much is consistent with my view that universals are classes. But it is also consistent with other incompatible views, such as the property-view, and the intensional-view. Predicates might be extensionally, or intensionally defined. And, since this quote makes no specific metaphysical or ontological claims, we still do not know whether they refer to properties of particulars or to collections of them. So this weapon seems harmless.

Luckily, Aristotle does make more decisive claims. Two passages from the *Categories* give us what I call 'the existential dependence' of universals, and the 'actual instantiation' requirement for universals. The former goes:

In fine, then, all things whatsoever, save what we call primary substances, are predicates of primary substances or present in such as their subjects. And where there no primary substance, nought else could so much as exist. *Categories* 2b3-6

The claim seems obvious here. The existence of a universal (i.e., something predicated of a primary substance) depends on the existence of the particulars that it is true of. This is consistent with the extensionalist view of universals. In so far as particulars are the extension, and the universal is the collection of these, there will be no universal where nothing falls in its extension. Furthermore, in order to make this consistent with the grammatical feature of universals, the extensional view can easily claim that universals are non-unit classes.<sup>36</sup> However, as I will try to show later on, these claims are inconsistent with non-extensional accounts of universals.

Something similar goes on with what I dub 'the actual instantiation' feature of universals.

It does not of necessity follow that, if one of the contraries exists, then the other must also exist. For suppose that all things became healthy. There then would be health, not disease. Or suppose that all things became white. There would then be white only, not black. *Categories* 14a6-10

Aristotle seems to be claiming, implicitly, that universals require actual instantiation. If no thing is (actually) white, then there is no WHITE. Once again,

<sup>36</sup> I take this detailed suggestion from Irwin (1988) p. 79-80.

the extensional view has no problem accepting this claim, unlike the other opposing view.

So far we have seen three properties of universals, all of which seem to be amiable with an extensional account. I have claimed that two of them (i.e., existential dependence and actual instantiation) are not consistent with other views. There is more to be said on this direction. In *Metaphysics*  $\Lambda$  Aristotle presents the ‘causal inefficacy of universals’.

Further, one must observe that some causes can be expressed in universal terms, and some cannot. The primary principles of all things are the actual primary ‘this’ and another thing which exists potentially. The universal causes, then, of which we spoke do not *exist*. For the *individual* is the source of the individuals. For while man is the cause of man universally, there *is* no universal man; but Peleus is the cause of Achilles, and your father of you, and this particular *b* of this particular *ba*, though *b* in general is the cause of *ba* taken without qualification. *Metaphysics*  $\Lambda$  1071a16-24

The passage speaks for itself. Whatever it is that universals are, they are not causally efficacious, *because* it is only particulars that cause particulars. Needless to say, this is consistent with the extensional view; and it may also be claimed to be consistent with the intensional proposal. Nonetheless, it seems to be the end of the road for the property-view. Or so I will argue.

Finally, we reach my favorite piece of support. *Metaphysics*  $\Delta$  26 gives a clear account of universals in terms of containment, one that “is evidently a universal as a class or set.”<sup>37</sup>

We call a WHOLE both that of which no part is absent out of those of which we call it a whole naturally; and what contains its content in such a manner that they are one thing, and this in two ways, either as *each* being one thing or as *making up* one thing. For what is universal and what is said to be as a whole, implying that it is a certain whole, is a universal as containing several things, by being predicated of each of them and by their all – each one – being one thing; as for instances man, horse, god, because they are all animals. But what is continuous and limited [is a whole] when it is some one thing made up of more than one

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<sup>37</sup> Lloyd, (1981), 8.

thing, especially when these are potential constituents of it but, if not, when they are actual. Among all these, what is naturally of such a kind is more [a whole] than what is artificially, as we said in the case of what is one [6. 1016a4]; wholeness being a kind of oneness. *Metaphysics* Δ, 26, 1023b26-37<sup>38</sup>

Aristotle claims that universals contain the particulars that they are predicated of, and that they are made up of more than one of them. It is difficult to see how else one should understand this, if not in extensional terms. Furthermore, and before jumping into a much required *têt-à-têt*, I should note that Aristotle does consider both potential and actual particulars as part of the extension of a universal. This will be terribly important when I defend my view against the fineness-of-grain objection.

So universals are predicates of multiple particulars. They are existentially dependent on them, and require multiple instantiation (whether actual or potential). They are causally inefficacious and are better understood as containing the particulars (actual or potential) of which they are predicated. That much is my evidence on behalf of the extensional view.

Allow me now to defend my view against my opponents. I will try to face as many of them as possible. Some will deserve pages, some only footnotes,<sup>39</sup> and some an appendix.<sup>40</sup> I do not intend this to be an exhaustive review of the positions. That would be foolish. Rather, I intend to show that my position is tenable. I do so by comparing it against views that have been taken to be so.

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<sup>38</sup> Lloyd points out that the Greek word ‘*Ólou*’ translated as ‘Whole’ at the beginning of the passage, is a variant of ‘*Kathólou*’ which is translated for ‘universal’. Ross who, unlike Kirwan, translates ‘*kathólou*’ in 1023b29, for ‘class’ and not ‘universal’, seems to recognize that something in the vicinity of classes is going on here. Caston (*pers. comm.*) however, points that the greek transcription of *ólou*’ has a rough breathing, which suggests ‘*hólou*’ is a better transcription.

<sup>39</sup> Actually, only the Nominalists. According to Irwin (1988), some (e.g., Sachs (1948) and Hartman (1977)) wish to deny that Aristotelian universals are real things. If they do so, their position is easily refuted. Aristotle defines universals as *being* among the categories of *things* that exist. That is just how the ‘predicate’ account defines them. And, in so far as they are not their members, they are something else (e.g., the collection of them). For a better reply to Sachs (1948), see Mure (1949). For more information on Hartman (1977) see Irwin (1988), Chapter 4, 78-79, and specially footnote 11.

<sup>40</sup> See Appendix A, for an extensional solution to the Zeta Controversy.

## Against the Property view

Jones (1975) argues against the extensional reading. He is concerned with *Categories* 2b3-6, where Aristotle seems to state the priority of primary over secondary substance. As we have seen, Aristotle makes a conditional claim whereby he makes the existence of predicates (i.e., universals) dependent upon that of primary substance. Briefly put, Jones claims that there is more than just the extensional reading of the priority thesis, that there are reasons to reject the extensional reading and, thus, that there are reasons to accept the alternative non-extensional reading.

I have claimed that the priority thesis is especially amiable with the extensional story. In so far as extensions are collections of particulars (i.e., primary substances), it trivially follows that no such extension exists where there are no members of it. Jones points out that there is at least one alternative reading that is consistent with the priority thesis, namely, the property account. If universals are properties of particulars, then they do not exist where there is no particular to be a property of. The existential dependence is quite clear.

Jones points out three important differences between these views. First, a non-unit extension “must have a plurality of members to exist, a property can exist with only one instance.”<sup>41</sup> Second, according to the property-view a universal is present *in* the particular of which it is a property. Third, the property-view is concerned with “that in virtue of which each individual is what it is”, whereas the extension – what he calls “aggregate-view” – is concerned with “the aggregate of such individuals.”<sup>42</sup> The extensional account does not take universals to be *in* the particulars and it does not take universals to be the cause of any particular.

Jones offers some textual evidence intended to go against the extensional reading.

Every substance seems to signify ‘this something’. As regards the primary substances, it is indisputably true that each of them signifies ‘this something’; for the thing revealed is an individual and one thing in number. But as regards the secondary substances, though it appears from the form of calling – when one speaks of a man or an animal – that a secondary substance signifies ‘this something’, this is not really true; rather it signifies what like something; for the subject is not, as the primary substance

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<sup>41</sup> Jones, (1975), p. 161

<sup>42</sup> *Ibidem*.

is, one thing, but man and animal are said of many things... The species and the genus mark off what like concerning substance – for they signify what like a substance. *Categories* 3b10-16 and 20-21<sup>43</sup>

Jones argues that only the property-view can make sense of this passage. Aristotle clearly says that it is because of the form of calling particular individuals (e.g., calling Callias ‘a man’) that it seems as if universals refer to individual things (i.e., ‘this man’). In other words, Aristotle accepts that particulars can be referred to by means of universal terms. It is not true, however, that the extension of all men can also be called ‘a man’. Jones thinks that this cancels the extensional reading because the reason why many things can be called ‘a man’ is *not because* the extension can be called like that. “Rather the point would seem to be that (...) each particular man is ‘this man’ but a man is not necessarily this man – there are other men, each of which is equally (3b 33-4 a9) a man, and can just as well be called “a man”.”<sup>44</sup>

I am not sure if I understand Jones here. What follows is my reconstruction of his claims. (P1) Universal terms are said of many things. (P2) If universals are extensions, then universal terms are said of many things *because* they are said of the extension itself. (P3) However, the universal term is not used to refer to the extension. Rather universals are said of many things *because* each thing is properly called like that on its own right. (C)Therefore, the extensional reading is not true.

If this is Jones’ argument then I believe there are good reasons to reject it. There appears to be a confusion here concerning the extension-member relation. All through his paper it seems as if Jones takes an extension, or a collection, as if it were a distinct, separate, thing from its members. Otherwise it makes no sense to say that a term applies to a member of the extension but not to the extension. The extension, or collection, is defined by its members. If each and every particular man is properly called ‘a man’, then the extension itself is being called ‘a man’. It is not as if we can put the members on one side and the extension on the other. An extensional reading can easily adopt Jones’ reading of the problematic passage. ‘Man’ is said of many things not because the collection of men is a man, but because many particular individuals are, by

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<sup>43</sup> This is Jones’ translation of the fragment. See Jones, (1975), p. 162.

<sup>44</sup> *Ibid.*, p. 163

their own right, a man. The extensionalist need only add that the extension is nothing over and above those particular men.<sup>45</sup>

Let me now try to point out the reasons I have to reject the property reading of the priority claim. There are two important features, besides from the existential dependence (i.e., priority of primary substance) of universals, which Jones seems to forget. First, universals *require* multiple instantiation. However, properties only depend upon the existence of one single individual. Properties can exist even if they are true of only one individual, not multiple ones.

As Irwin (1988) points out, whether or not this is a successful criticism of the property-view depends on whether we take Aristotle's definition to say that universals *must* be true of multiple individuals. The mere fact that it is a definition of universals, speaks on behalf of it. Aristotle explicitly says that 'being true of multiple things' is part of the *nature* of a universal. However, as Irwin (1988) says, 'being in the nature of a universal' is ambiguous between 'must by nature be' and 'can by nature be'. The property-view is consistent only with the latter. But, then we have the passage in *Categories* 14a6-10 to sort things out. Here Aristotle demands actual instantiation for universals. If there are no black things, then there is no BLACK.

A second feature of universals that speaks against the property-view is their causal inefficacy. According to *Metaphysics* Λ 1071a16-24, universals are *not* causes of particulars. If so, then they are not among the things *in virtue of which* particulars are what they are. This directly contradicts the way in which Jones presents the property view; i.e., as "concerned itself with that in virtue of which each individual is what it is". Jones might be right in claiming that there are at least two possible readings of the priority claim. We have now seen good reasons to reject one of them, namely, the property-view.

### Against the In-Particulars view

Owen (1965) claims that the grammatical account of universals is just one of at least two given in the *Categories*. He claims that Aristotle also distinguishes universals as 'belonging to something'. He wants to argue against the predominance of the grammatical account by giving a different proposal.<sup>46</sup>

He claims that non-substantial individuals (e.g., like a shade of a color, call it 'vink') can be present in multiple individuals, although they cannot be

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<sup>45</sup> A similar problem underlies Jones' second argument extensional reading; according to him it is inconvenient for matters of counting. For matters of space I will not deal with this objection here.

<sup>46</sup> See Heinaman (1981) for a detailed argument against it.

predicated of multiple things. “To say that vink is a particular colour is to say that it, or its name, cannot be predicated: it is not to say that it cannot be found in more than one subject.” Owen’s thesis is that such individuals that are present-in can be present in multiple objects and, so, are taken to be universals. Like MAN, which “cannot exist separately from *that of which it is the substance*”, vink cannot exist “without something to contain it.”<sup>47</sup> I doubt, however, that this analogy is good enough to make of vink a universal.

Vink can exist without existing in multiple individuals. Owen notices this problem, and retorts that to claim the existential dependence of universals over particulars is “to say that its existence requires (indeed consists in) the existence of at least one individual falling under the classification.”<sup>48</sup> I have already argued that this way of putting things goes against several features that Aristotle takes universals to have, like multiple and *actual* instantiation.

It is convenient to support my criticism upon the grammatical definition that Owen wants to reject. Luckily, there are further problems. Owen’s view is explicitly inconsistent with the ‘containment’ view of universals that Aristotle delivers in *Metaphysics* Δ 26. Owen says vink *is contained* in substantial individuals. Aristotle says universals *contain* their particulars. So objects that can be present-in multiple objects and still not be predicated of them cannot be a universal according to Aristotle.

### Against the Intensional view

It is a common intensionalist objection against extensional views that extensions are not fine-grained enough. If all there is to a universal is its extension, then terms of coextensive universals should be synonymous, or otherwise substitutable *salva veritate*. But surely this is not the case. For, say, RENATE and CHORDATE have the same extension, but one is about kidneyed-creatures and the other about hearted-creatures. Usually the best way to cash out the detailed distinctions that extensions miss is in modal terms. The sentence ‘necessarily all renates are renates’ is true, while the sentence ‘necessarily all renates are chordates’ is false.

While I agree that this is generally a problem for extensional proposals, I doubt that it is so for Aristotelian universals extensionally understood. Aristotle does distinguish between potential and actual extensions, members, or instances of universals. This appears in *Metaphysics* Δ.26, where Aristotle presents uni-

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<sup>47</sup> Owen, (1965), p.104.

<sup>48</sup> Ibid, p.105

versals as collections of particulars. It is easy to see how this is going to work.<sup>49</sup> If ‘necessarily all renates are chordates’ is false, it *must* be that not *all* actual and potential chordates are either actual or potential renates. Otherwise, there would be a necessary connection between being a chordate and being a renate; and the sentence ‘necessarily all renates are chordates’ would be true, not false. So, it must be that CHORDATE and RENATE have the same actual extension, but not the same potential extension. The terms are not synonymous *because* they are not coextensive.

This solution, of course, depends on Aristotle’s account of what ‘actual’ and ‘potential’ means. Contemporary philosophers like to talk about ‘possibility’ and ‘actuality’ instead, the analysis of which often leads to possible worlds.<sup>50</sup> It might be that possible world semantics requires intensions. However, I am pretty sure that nothing like this is going on with Aristotle’s potential/actual distinction.<sup>51</sup>

That said, Irwin ((1988), p. 79) seems to have a stronger objection. He argues that Aristotle distinguishes even between necessarily coextensive universals. GRAMMARIAN and MAN are the examples. On his view, even though the sentence ‘Necessarily every grammarian is a man’ is true, ‘grammarian’ and ‘man’ have different meanings. So, the terms cannot be extensionally defined for they have the same actual and potential extensions. For this to be so there must be some context where the terms are not interchangeable *salva veritate*. Let us see what Aristotle says.

A *property (ídiōn)* is something which does not show the essence of a thing but belongs to it alone and is predicated convertibly of it. For example, it is a property of man to be capable of learning grammar; for if a certain being is a man, he is capable

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<sup>49</sup> In fact it is very similar to way in which Lewis (1986), for example, deals with this problem. See Lewis (1986), p. 50-53

<sup>50</sup> Lewis (1986) is perhaps the paradigmatic example. He explicitly defends an extensional account of properties. This, however, is owed to his endorsement of possible worlds as *concreta*. Many shy away from this and define properties as intensionally defined extensions (see Jackson (1998) and Chalmers (2006)). There is a lack of concrete instances when you are not a modal realist. Aristotle, however, does not hold any of these views. For him, potential and actual instances are both concrete and actual. So, in a sense, we can have more concrete instances than just the actual ones, without a plurality of worlds. This, of course, is not an account of the actual/potential distinction in Aristotle.

<sup>51</sup> And so does Charles (2000), see Introduction and Chapter 13

of learning grammar, and if he is capable of learning grammar, he is a man. For no one calls anything a property which can possibly belong to something else. *Topics*, I.5 102a 18-25

The passage states a biconditional claim. X is a grammarian if and only if X is a man. If so, then everything that is true of any grammarian is *ipso facto* true of a man, and vice versa. Yet, ‘man’ and ‘grammarian’ are not interchangeable *inter alia* and *salva veritate*. For this to be so there must be an opaque context (i.e., a context where the reference of the terms is not what is at stake) where ‘man’ and ‘grammarian’ are not substitutable. According to Irwin, “Aristotle must assume that ‘F reveals the essence of G’ does not allow the substitution of coreferential terms for ‘F’.”<sup>52</sup> So, what does ‘revealing the essence’ mean?

The passage in question is part of a larger section where Aristotle distinguishes between definition ‘*hóros*’, property ‘*ídion*’, genus ‘*génos*’, and accident ‘*sumbebêkòs*’. Of definitions he says that they “indicate the essence.” [101b37-38] and in *Metaphysics* Z.11 Aristotle claims that definitions are of the universal. So, if properties do not indicate the essence – if they don’t do the explanatory work – then they must not be universals *strictu sensu*.<sup>53</sup> So we get one initial difference between ‘man’ and ‘grammarian’; the former is a universal, the latter is not.

It follows that, as Kung (1977) and Charles (2000) point out, Aristotle distinguishes NECESSITY from ESSENTIALITY. Gill (2005) and Kung (1977) agree that this difference has to do with explanation: A is an essential predicate of x iff A explains what it is to be x. But we keep passing the buck. What does it mean ‘to explain what it is to be x’? Gill and Kung offer slightly different accounts,<sup>54</sup> but neither is concerned with content or reference.<sup>55</sup>

Kung (1977) argues that in *Post. An.*, Aristotle “seems to have in mind some sort of axiomatic system” [p. 370] concerning scientific theories. Scien-

<sup>52</sup> Irwin, 1988, 79

<sup>53</sup> Engmann (1978) argues that this requirement (i.e., that universals are restricted to essential predication) is central to Aristotelian universals.

<sup>54</sup> Gill (2005) argues that Aristotle’s account of essence in *Metaphysics* Z.4 relies on a distinction from *Post. An.* I.4 73a350b5 concerning *kath’ hautó* predicate. “Y belongs to X *kath’ hautó* in one way, if Y is predicated of X, and Y must be mentioned in the account of what X is (call Y an essential predicate of X, since Y must belong to X if X is to be what it is) [...] Thus, the essence of something is limited to properties predicated of that thing which must be mentioned in the account of what it is.” Gill, (2005), p. 238.

<sup>55</sup> Charles (2000) claims that, for Aristotle, ESSENTIALITY is not a matter of thought nor language, but metaphysics. This suggests, on my behalf, that indicating essence, or not, need not map on to differences in terms of meaning or content.

tific theories “begin with basic principles and definitions” [p.365] of the genus to be studied. Other properties are to be derived or demonstrated by means of these. As for the basic principles and definition, they are given in terms of “what is unqualifiedly prior and more knowable” [p.369]. All these, according to Kung, are features of an essential property: essential properties are distinct because of their explanatory power. To have explanatory power implies that the concept of that universal constitutes a starting point in the inquiry from which others are derived. To be a starting point is owed to its relational properties (i.e., being more evident or more knowable to a theorist).

If this is true, then the difference between GRAMMARIAN and MAN is relational. So it is true that the terms have the same extension and yet differ. What is not true is that they have the same relations. The question boils down, then, to how far does the extensionalist want to go. One might want to distinguish between referential and relational extensions. If so, then the main question is whether or not one can make sense of relations by purely extensional means. And the answer is positive. As Lewis (1986) has taught us,<sup>56</sup> we can account for relations in terms of collections of ordered pairs, triples, and what not. Aristotle gives us the required materials to do so: we have actual and potential men just like we have actual and potential grammarians, and they can *all* be members of the collections we need them to be members of.

I should not be read as claiming that Aristotle has anything close to a logic of relations. All that I claim is that, following Kung (1977) and Gill (2005), Aristotle’s distinction between essential and necessary properties is in terms of relations; and that this distinction in turn *can* be cashed out in purely extensional terms given the resources of potential and actual instances that Aristotle *does* have.

If this is not enough, here is another reason to think that the extensional account is Aristotle’s. If the extensional account does not work, neither will the intensional one. Irwin mentions what seems to be the view he favors: “a non-unit class, intensionally conceived.”<sup>57</sup> Irwin does not say, however, how we are supposed to understand intensions. Suppose we do it in the traditional way, and take intensions to be functions from worlds to sets of objects. Hence, the non-unit class of grammarians is defined as the set of objects that the function GRAMMARIAN spits out once you give a world to it.

The problem is this, if GRAMMARIAN and MAN are necessarily coextensive, it does not matter what world you pick, both functions will always give

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<sup>56</sup> See Lewis (1986), 51-55.

<sup>57</sup> Irwin, *Op. Cit.*, 80.

you the same class of objects as a result. That is unless, of course, we want to include relational properties.<sup>58</sup> This would give us different functions for each universal. But then we would have all we need for the extensional account to work. So Irwin's case of necessarily coextensive yet distinct terms is, at the most, neutral between the extensional and intensional views.

I believe, nonetheless, that there is a way to decide between the two. The intensional-view faces some problems that the extensional one saves. The former is inconsistent with the actual instantiation requirement and the existential dependence that universals have upon particulars. Intensions simply do not depend upon the values they give. Even with no actual white thing falling in the extension of 'White' there is still an intension defining the term. Intensionally defined terms simply do not require actual instances. For similar reasons, intensionally defined universals simply do not existentially depend upon their instances. Irwin is aware of the latter problem and dismisses it by claiming that Aristotle does not argue adequately for the dependence claim.<sup>59</sup> He recognizes that this existential dependence is argued for in *Categories* 2a34b6, but takes the passage to claim that universals are dependent on particulars either because they are predicated of them, or because they inhere in them. Irwin then goes on to reject the second option. If we were Platonic, we will simply "reject Aristotle's claim about inherence."<sup>60</sup>

So inherence goes, but what about predication? Why does Irwin think that the relation 'being predicated of' does not entail existential dependence? Perhaps he is assuming that predication is defined intensionally precluding, thus, the existential dependence. However, if we consider the extensional account I have been arguing for, existential dependence becomes a live option. On this view, universals are nothing but the class of things that they are predicated of. If there is nothing to be predicated of, there is no predicate. Of course, this is an option that Irwin is not considering, though perhaps he should; for it not only makes sense of the existential dependence of universals, but also of all the other requirements that I have here mentioned. In any case, it is clear that intensional

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<sup>58</sup> Of course, the intensionalist may want to go hyperintensional here and claim that there are intensions determining intensions. So that, perhaps in some contexts, the hyperintension of GRAMMARIAN delivers a different intension than the one it delivers for MAN. That is all fine with me, but if we can allow for hyperintensions to do the work, I don't see why we cannot allow as well for relational properties extensionally defined.

<sup>59</sup> I am not convinced by Irwin's argument, but even if it were successful, it would not show that Aristotle did not take universals to be existentially dependent; and that seems to be what is at issue here.

<sup>60</sup> *Ibid.*, p.82

views have problems explaining – or getting rid of – the actual instantiation requirement and existential dependence of universals over particulars. Irwin, at least, is not successful.

Aristotle takes universals to be predicable of multiple individuals, causally inefficacious, existentially dependent upon the things they are predicated of, and which they contain, regardless of whether they are potential or actual instances. All these features strongly suggest that Aristotle's universals are better understood as extensions or classes of objects, not as properties, intensionally defined extensions, or inherent features of particulars. Furthermore, the fact that potential and actual members are considered allows the account to be fine-grained enough.

We now have the elements required for an extensional account of perceptual content in Aristotle's theory of perception. Aristotle claims that, at least in one sense, perception is of universals, that perception supplies the intellect (which has universals as contents) with the necessary materials to operate, and that both perception and thought have analogous discriminatory capacities. Thus, I claimed that whatever happens with thought, it must be similar to what goes on with perception. I gave two reasons to expect perceptual content to be similar to that of thought. Perception is the starting point which supplies thought with the necessary material; and both, perception and thought, are discriminatory faculties. We have seen how Aristotle takes perception and universals to be related, so we know how universals affect perceptual content and how perception affects the content of thought. Based on this, in sections 2 and 3 I argued that perceptual content can be understood extensionally if we could successfully defend an extensional account of universals. I hope to have shown how this is possible.

## 5. Problems with the Extensional Story?

Caston [p.c.] objects that it is not clear why it is that universals are capable of being defined and known, but particulars are not. After all, universals are collections of particulars. Furthermore, if a universal is the extension of all, potential and actual, members, it seems rather difficult that we will ever grasp a universal. Let me attend to these objections in brief.

### 5.1. If universals are extensions, what makes them so (definition-knowledge) special?

It is important to note that, even though they are collections of particulars (e.g., single, pairs, triples, etc.) universals are importantly different from particulars. There are several differences in between that make universals, to put it somehow, epistemically special.

Recall the characteristics of universals that I have already presented. They are, to begin with, causally inefficacious; this points to the idea that, unlike particulars, universals are not made out of matter. Nonetheless, their existence depends upon that of things that are made out of form and matter. Furthermore, if what I have argued is correct, universals need not limit themselves to single particulars. A universal can, and must, include ordered pairs, triples, and what not, in order to account for relations. This, as we saw, is important to account for Aristotle's distinction between necessary and essential properties and, hence, between a concept that defines a particular, and one that does not. So universals seem to be collections of objects and relations among objects following a certain logical structure. It would not be too wild to say that universals are logical entities, not material entities. That should be enough to tell us in what sense universals are capable of being defined (i.e., reveal the essence of their members), but not particulars.<sup>61</sup>

There are further differences. As the grammatical definition tells us, universals are true of multiple particulars, which are contained by them. This feature, being true of multiple particulars, is what allows thought to draw proofs and demonstrations, which in turn yield explanations and, hence, understanding. Particulars, however, lack this important property. No demonstration follows from particulars and so does no explanation nor understanding.

According to *Post. An.* I.18, one can learn either by induction or demonstration; the former proceeds from particulars, the latter from universals (or extensions). Furthermore, the latter is dependent on the former in a way that mimics the existential dependence of universals upon particulars. There is no deduction without induction. Inductions, however, are not explanations. They are powerful enough to give us the view we need of the universal (i.e., the extension) in order to make deductions, give proofs, and explanations (e.g. if all men are mortal, then Socrates is mortal if he is a man).

Even within the extensional interpretation there are good reasons to think that knowledge, and definitions, are of universals and not of particulars.

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<sup>61</sup> See section 4, pages 27-31 of this text, and Kung (1977).

## 5.2. How to Grasp an Extensional Universal

In sections 2 and 3 I claimed that repeated instances of the same perceptual experience yield, according to *Post. An.* I.31, “a view of the universal.” *Post. An.* II.19 confirms this by claiming that some universals are acquired by perception. After presenting the four-step developmental process, Aristotle concludes: “it is necessary for us to become familiar with the primitives by induction; for perception too instills the universal in this way.” [*Post. An.* II.19 100b4-5].

This, I think, is Aristotle’s solution to Meno’s problem. Even if universals, as extensions, include particulars that we will not perceive, that is no hindrance for us to *grasp* them. All we need is a relevant number of perceptual experiences from which we can discriminate and, by induction, infer the truth of the universal. Nothing magical stands behind the phrase ‘by induction’. We certainly do not need to see all possible crows to claim that all crows are black. A good number of them are enough. Aristotle seems to think that something similar goes on with universals. Provided that we can discriminate among the perceptual experiences that we can retrieve, universals can be grasped or entertained by induction. At least that is the case of the concepts (i.e., primitives) with which learning gets started.

However, Caston thinks, this repeated-perceptions requirement is at odds with *Post. An.* I.31. Here Aristotle seems to be claiming that “in some cases” we can come to know a universal from a single perceptual experience. I have mentioned this passage [*Post. An.* I.31 88a13-15] before.<sup>62</sup> I believe that the passage does not suggest *that* but, rather, that a single perceptual experience may put us in place to gain understanding, *only if* we are able to conceive what goes on with other multiple instances.

According to Caston’s own translation, what Aristotle says of certain abnormal perceptual experiences is that ‘it is not that we know by seeing, but rather that we have [or possess] the universal from seeing.’ The passage seems to go against the claim that we may know a universal from a single perceptual experience. It admits that, in these cases, one may come to have the universal. The question is, then, what Aristotle means by ‘having the universal’. We know it cannot be something like ‘knowing the universal’. The subsequent lines make things clearer.

If we could see the channels of the burning glass and the light passing through, it would also be obvious why it burns; because

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<sup>62</sup> See section 3, page 13, and footnote 23.

we should see the effect severally in each particular instance, and appreciate at the same time that this is what happens in every case. *Post. An.* I.3188a15-18

The passage suggests, against Caston's reading, that 'having a universal' means something like 'being able to see the effect in each particular instance'. This, however, does not seem to contradict the repeated-perceptions requirement. Aristotle is equating certain abnormal, single, perceptual experiences with multiple ones not because they allow us to grasp the universal but because both allow us to see what happens in multiple cases.<sup>63</sup> Grasping a universal has to do with being acquainted with *multiple particular instances*. And this does not seem to be at odds with the extensional account of universals, the doctrine of cognitive development above mentioned, or with the account of learning (i.e. acquiring universals) in terms of induction.

## Conclusions

In this paper I have defended an extensional account of perceptual content in Aristotle's theory of perception. I have argued that it can account for the role of predicates and universals by defending an extensional account perceptual content (section 2 and 3) and of Aristotelian universals (section 4).

In section 1 I offered an extensional account of intrinsic and extrinsic perception, and misperception. This is basically a translation of Caston's [ms] non-extensional proposal into extensional language.

I have argued (section 2 and 3) that perception is importantly related with universals and knowledge. For Aristotle, perception supplies the intellect (*noûs*) with the images (*phantásmata*) necessary for it to operate. Cognitive development (or learning) takes place when the intellect retrieves those images and discriminates among them, allowing the mind to understand or grasp a universal. For this to be the case the content of perception must share something in common with the content of thought. This, I have claimed, is accounted for by the discriminatory capacity of perception. Aristotle takes all animals to have

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<sup>63</sup> To my mind, this is far from suggesting that universals may be grasped from particular cases. In the extreme case, this may be read as claiming that *abnormal* instances of perception may take the place of multiple perceptual instances in our way to grasp the universal. This is far from claiming that it is possible to grasp the universal from individual cases. It would be tantamount to claim that, since abnormal members of the species grow wings, it is possible for humans to grow wings.

a common cognitive capacity; i.e., perceptual discrimination. Such capacity allows them to parse the information received and classify it (e.g., as a color, as a smell, as red, as sweet, etc.). This gives place to the claim that the content of perception is understood analogously to that of thought (i.e., extensionally).

Even more, Aristotle takes both, perception and thought to have analogous discriminatory capacities. Hence, if universals are extensions and constitute the content of thought, there are good reasons to think that the content of perception is extensionally understood as well.

Still, I have kept the proper distinction in place. The claim that both, perceptual and intellectual content are extensionally understood does not allow us to think that they are of the same kind. Perception is, in actuality, of particulars, while thought is of universals. The gap in between is bridged by mnemonic capacities (i.e., mainly storage and retrieval) that only some animals have. That is how thought differs from perception, and why humans differ from animals.

The discussion concerning the distinction between necessarily coextensive yet distinct concepts (section 4) should be enough to show that the extensional account can be as fine-grained as needed.

Last, but not least: it might be said that my proposal is anachronistic. Against such objection all I have to say is that the same goes for opposing proposals. It might as well be that the notion of an extension is not within Aristotle's notions; but the same goes for intensions, according to Sorabji (1991) & (1992). If using notions that are foreign to an author in order to interpret him is a sin, then all interpretations should be considered heresy.

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