

Article

Undetachable Concepts in Non-Human Animals

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Abstract: In this paper, I would like to explore the idea that some non-human animals may be incapable of detaching or separating some of their concepts both from other concepts and from the larger thought contents that they are part of. This, in turn, will make it impossible for them to recombine these undetachable concepts with others in every admissible way. I will begin by distinguishing three different ways in which one concept may be undetachable from others, and I will show how each of them leads to specific restrictions in the kinds of conceptual re-combinations that they admit. Finally, I will try to provide some theoretical reasons, as well as some empirical evidence, to give at least initial support to the hypothesis that some non-human animals actually suffer from the limitations previously identified.

Keywords: concepts; animal cognition; the Generality Constraint; conceptual recombination; conceptual detachability

1. Introduction

It is widely accepted in Philosophy that paradigmatic examples of propositional contents involve representing some particular entities as being thus and so or, putting it differently, as having certain properties or characteristics.¹ Thus, having a thought with a propositional content such as *John is tall* involves thinking about John, about the property of being tall, and attributing the latter to the former [2–6]. Once this is accepted, it can also be argued that, when we have thoughts about particular objects, two kinds of concepts, with their own distinctive semantic functions, compose the contents of our thoughts: “concepts of particulars”, or “object concepts”, and “concepts of properties” [2–4,7].² Now, property concepts are usually thought to be *general*, in the sense that they can be attributed to many different particulars. In turn, those who defend the existence of concepts of particulars frequently claim that they involve the capacity to think about individual entities as the *same ones* in our different encounters with them, despite the fact that their properties may change or differ from one encounter to another [2,3,8,9]. If all this is correct, then it seems that the concepts that compose propositional contents should be redeployable in different contexts.

Some philosophers have taken this idea one step further and argued that, besides being capable of generalizing their predicative concepts to different particulars and thinking about particulars as

¹ It seems plausible to think that the most basic cases of propositional contents will refer to physical particular objects. Nevertheless, one may also find propositional contents that refer to other kinds of particular entities, such as abstract objects, instances of properties, or instances of relations. Additionally, there are also propositional contents that do not refer to any propositional entity at all, as happens in the case of a content like “some cabins are red” [1].

² Following Evans [4] and Camp [3], I will understand concepts as amounting to some specific cognitive abilities and I will use the terms “concepts” and “conceptual abilities” interchangeably.

having different properties, genuine thinking creatures must satisfy a strict version of what Evans calls the Generality Constraint (GC)³.

According to Evans' original statement:

“ . . . if a subject can be credited with the thought that *a is F*, then he must have the conceptual resources for entertaining the thought that *a is G*, for every property of being *G* of which he has a conception” [4] (p. 104).

As stated here, GC is a demanding constraint according to which thinking creatures must be capable of recombining each of their concepts of particulars with every property concept in their possession.⁴ In addition, even if he does not state it explicitly in this quote, Evans also requires that they must be capable, inversely, of recombining every property concept with every particular concept in their conceptual baggage. In brief, according to Evans, genuine thinkers must be capable of combining their concepts of properties and particulars in any admissible way.⁵

Some philosophers have suggested that, if we understand GC in this demanding sense, we will have to refrain from ascribing concepts to non-human animals, since empirical evidence indicates that there are limits to the ways in which they can recombine their representations to form new thoughts [3,13,14]. What is more, Camp [3] and Carruthers [14] have pointed out that, if we claim that creatures who are incapable of some conceptual combinations do not possess concepts at all, we may end up having to exclude adult human animals from the realm of concept users.⁶ These philosophers suggest, instead, that we should adopt a more inclusive and gradualist view of concept possession and defend that at least some species of non-human animals have some basic conceptual abilities.

Now, if we accept that there may exist non-human concept users that do not satisfy the full-blown version of GC, we still have much to explore regarding the kinds of limitations that these creatures could suffer when it comes to recombining their concepts in order to form new thought contents. In this paper, I would like to advance in the exploration and charting of this scarcely-known terrain by focusing on how, sometimes, the capacity of different animals to recombine some of their concepts might be affected by another closely related capacity: detaching, or separating, those concepts from the larger thought contents in which they are embedded.

Consider the case of a mental content such as *a is F*, in which a property concept *F* is combined with the concept of a particular *a*. If, in order to think such a thought, animals had to satisfy GC in its full-blown version, they would have to be capable of combining each of these two concepts with every other concept in their repertoires in every admissible way. However, if we admit, following philosophers such as Camp and Carruthers, that animals may entertain such a thought, and possess the concepts *F* and *a*, while only satisfying GC up to a certain grade, then an interesting possibility opens up: they may be capable of combining those concepts with others in *some* ways, but not in *every* way. Thus, a creature *C* may, for example, be capable of combining *a* with *G* and *H*, but not with *J*, and she may be capable of combining *F* with *b* and *c*, but not with *d*.

³ Lievers [5] and Dickie [10] reconstruct the main reasons given by Evans [4] and Peacocke [11] in favour of such a distinction.

⁴ Strictly speaking, Evans uses a different terminology: he speaks of “concepts”, to refer to property concepts, and of “Ideas”, to refer to what I am calling here “concepts of particulars”. My terminological choice follows contemporary presentations of the Generality Constraint, which usually refer to all the components of thoughts as concepts (see [3,12–16]).

⁵ The requirement that it should be possible to recombine concepts of particulars and concepts of properties in every admissible way can be interpreted in two different senses. Philosophers like Evans [4], Peacocke [11], and Strawson [17] seem to think that some conceptual combinations are too heterogeneous to form a complete and intelligible thought. According to them, concepts have “categories of appropriate application” and only those thoughts that combine concepts within these categories are intelligible. In other words: there are restrictions on the kinds of categories that can be recombined in an intelligible way. Consequently, GC should only require from concept possessors that they can make categorically appropriate combinations of their concepts. Camp [12] has argued, on the contrary, that we should not impose any categorial restrictions on conceptual significance or on conceptual competence. Consequently, she thinks that GC, in its full-blown sense, should require from concept possessors that they can recombine their concepts in every syntactically admissible way.

⁶ Evans himself seems to endorse a similar idea. See [4] (p. 105).

With these possibilities in mind, what I would like to do here is to explore the following hypothesis: in some occasions, the limitations in a creature's capacity to recombine her concepts will be the result of a different inability: that of *detaching* or *separating* some of her concepts both from other concepts and from the larger thought contents that they are part of.⁷

In the following sections, I will try to elaborate this idea by undertaking two different tasks. I will begin by distinguishing, without pretending to be exhaustive, three different ways in which some creatures' abilities to recombine their concepts could be restricted by distinct kinds of limitations in their capacities to separate some of their concepts from others. The main purpose, here, will be to show that these limitations constitute a coherent conceptual possibility. What is more, as we will see, these different kinds of undetachable concepts will be constituent parts of different sorts of *sui generis*, semi-structured contents, that have not been considered in the literature and deserve further exploration.

My second aim in this paper will be to show, even if in a rough and tentative way, that these conjectures may turn out to be explanatory fruitful. In order to do so, I will try to provide some theoretical reasons, as well as some empirical evidence, to give initial support to the hypothesis that there are non-human animals that do suffer from the limitations previously identified.

Before turning to these two tasks, I think it is worthwhile to spend some time clarifying a bit further three notions—i.e., those of *detachability*, *recombinability* and *redployment*—that will play a central role in the rest of the paper. This preliminary task will be undertaken in the next section.

2. Detachability, Recombinability, and Redeployment of Concepts

Suppose that a creature *C* thinks that *a* is *F*. It seems almost a truism that in order to be able to recombine the concepts *a* and *F* with other concepts in her possession, *C* needs to be previously capable of separating or detaching them from such content. Let us consider now what would happen in the opposite situation: imagine that *C* is capable of having some thoughts with contents composed by some specific concepts, but that she is incapable of separating *some* of these concepts from those contents. In such a case, she will be able to deploy the latter, but only as long as they are embedded in the former. She will not, instead, be capable of recombining these undetachable concepts with other concepts, nor will she be capable of redeploying them in further thoughts.

Even if we accept this picture of the way in which detachability and re-combinability of concepts are related, one may still wonder: what does it mean to say that some concepts can be detached (or not) from others? If we want to avoid circularity, we cannot merely claim that detachable concepts are those that can be freely recombined with others in further contents and, inversely, that undetachable concepts are those that cannot be so recombined. We need to characterize detachability in a way that is different from, and helps to explain, the capacity of some creatures to freely redeploy and recombine their concepts.

What I would like to suggest is that we may gain a better understanding of what is for a concept to be detachable (or not), by thinking about the conditions in which a creature may, or may not, be able to deploy and understand that concept. I will be assuming here that deploying concepts in thoughts is not a blind and brute activity, but an intelligent one. Consequently, deploying a concept involves having some understanding (even if minimal or tenuous) of its meaning. If this is so, we may understand the detachability and undetachability of concepts following terms: *C* has a concept that is undetachable from another one if in order to deploy the former, *C* needs to combine it with the latter. This is so, basically, because it is only when the undetachable concept is thus combined that it can

⁷ The combinatorial limitations of non-human animals may have other sources. Thus, Beck [13] has claimed that some animals are incapable of combining some representations with others as a result of their analogical format. Carruthers [14], in turn, has argued that some insects, like bees, may suffer from combinatorial limitations due to the fact that they use different representational systems and lack a way of integrating the representations from one of those systems with the representations from the other. Clearly, these cases seem to be independent and have different origins than undetachability.

actually mean something to the thinking creature. Thus, if C 's concept F is undetachable from concept a , C simply cannot grasp the meaning of F when it is not combined with a . A thought such as b is F is just unintelligible for her.

On the contrary, a concept is detachable for creature C when her capacity to use it, having some understanding of its meaning, does not depend on C 's simultaneously combining it with any other specific concept. C may manifest this capacity to detach her concepts in two different ways. In its full-blown sense, C has a detachable concept, such as F , if she can think about F , grasping the meaning of such a concept, regardless of whether F is combined with any other concept.⁸ However, C may also have a detachable concept F , in a weaker sense, if, even when she must always deploy F combining it with other concepts to form propositional contents, she can still understand or grasp the meaning of F regardless of which specific concepts in C 's repertoire it is combined with. In any of these two cases, I think it can be claimed that C 's concept satisfies what I would like to call the Detachability Condition (DC).

Let us suppose that C possesses a variety of concepts of properties and of particulars, but she cannot deploy some of these concepts with complete independence from some others. Thus, to take just one extreme example, imagine that C can only deploy concept F when she attributes F to one specific particular that C conceptualizes as a . For her, F does not mean anything when it is not combined with a . In such a case—as in others that I will examine below—the Detachability Condition is clearly violated, and it can be stated that F is undetachable from a . What is more, undetachability of concept F from certain concepts of particulars clearly implies that there will be limits to the ways in which it will be possible to recombine F with other concepts, and to redeploy it in further thoughts. If, returning to our previous example, concept F can only acquire its stable meaning when combined with the concept of particular a , it will not be possible to combine it with other concepts of particulars in intelligible ways. Moreover, something similar applies to other kinds of undetachability, as will be argued later on. Thus, detachability, as I have characterized it here, seems to be a necessary pre-condition for full-blown *redeployability and recombining*.

Leaning on these general ideas, in the next section I will distinguish—without aiming to be exhaustive—three different kinds of incapacities that some creatures may suffer to separate or detach some concepts in their possession from others and, consequently, to satisfy the Detachability Condition. In turn, I will also try to show that each of these specific failures to satisfy DC leads to specific limitations in the creatures' capacities to recombine and redeploy their concepts in further thoughts. Once that preliminary task is completed, I will present reasons in favor of the idea that having concepts with these limitations might end up being of adaptive value for some non-human animals, and I will examine several empirical examples of animal behavioral patterns, in order to show how they can be explained by one or other of the limitations to detach and recombine concepts that were previously identified.

Before moving on, however, some preliminary caveats are in order. First, I am not claiming here that the detachability limitations to be presented below constitute a general feature of *all* the concepts and contents of non-human animals. In other words, I am neither claiming that these varieties of conceptual undetachability constitute a general feature of animal cognition, nor that they are a general feature of some species' cognition. I am only defending the much more modest

⁸ It seems to me that having concepts of properties that are detachable in a full-blown sense involves different cognitive capacities than having analogously detachable concepts of particulars. To be capable of detaching property concept F in a full-blown sense involves understanding what *being an F* would consist in for any arbitrary particular. Arguably, this is the kind of capacity that allows a creature to entertain contents with existential quantifiers like: *There is an x such that x is F*. To be capable of detaching the concept of particular a , instead, involves being capable of thinking about a without entertaining any propositional content in which some property is explicitly predicated of a . But this does not necessarily mean that one must think about a *de re*. Another alternative is to defend that there are object-directed mental states—like, for example, *imagining my grandmother*—that are about particular objects, and represent these objects under specific aspects, but are non-propositional [18].

claim that there might be some animals who find it impossible to detach some particular concepts in their possession from others. This will, in turn, preclude them from making specific conceptual combinations. However, the whole problem might be quite local, and only restricted to a few concepts in the creatures' repertoire.

Secondly, many doubts will probably arise when it comes to classifying the kind of undetachable representations that I will be discussing below as *concepts*. The main reason for those doubts is that it is usually assumed, even by those who are willing to defend deflationary notions of concepts and concept-possession, that if a creature C has genuine concepts of properties (e.g., *F*) and of particulars (e.g., *a*), she must be at least capable of combining *a* with a second property concept, different from *F*, and *F* with another concept of particular different from *a*. Otherwise, it might be argued that all C has is a non-decomposable holistic representation of *a-as-being-F* and, moreover, that C lacks a separate understanding of what each of these components means on its own [14,19].

Even though I feel the force of these arguments, on what follows I will try to show that the kind of undetachable representations that I will be presenting in Section 3 are not holistic representations, and that the contents constituted by them are not entirely devoid of structure either. On the contrary, these representations compose contents that have some kind of structure, admit some (partial) decomposition and, arguably, still fulfill different (and differentiable) semantic functions. All of these are central features that these undetachable representations share with the fully-detachable concepts of properties and of particulars. This is, basically, the reason I will opt to call them "concepts" as well. Nevertheless, if someone prefers to reserve the notion of "concept" strictly for those representational units that can be detached and recombined at least in some ways with others, I have no problem with this more traditional use of the term. All I want to defend here is the possibility, and the heuristic value, of positing contents composed by more basic representational units that suffer from specific kinds of detachability and recombining limitations. A change in the way in which we name these representations is not so relevant—we may, for example, call them "proto-concepts" instead of concepts—as long as we are clear on which their main features are.

Let me briefly introduce one final worry. It seems that, in order to provide empirical evidence in favor of the existence of undetachable concepts, we should carefully select which kind of animal behavior to focus on. Why? Mainly because if we focus on animals that are so cognitively primitive that the attribution of concepts (or even of proto-concepts) to them seems to be out of the question, or highly unlikely, we would be completely unjustified in arguing, from their behavior, that they have *undetachable concepts* (or proto-concepts). This issue is closely related to a second problem: which are the conditions that a creature should satisfy in order to be credited with the possession of concepts? These are both highly controversial topics whose proper treatment would require a thorough discussion on which the requirements that should be imposed on concept possession are and whether the empirical evidence to be presented below satisfies them. Clearly, I cannot undertake such a task here. However, I would like to point out, nevertheless, that I have tried to provide empirical examples of animal behavior that reveal rather complex forms of cognition. In fact, all the behaviors to be examined below involve (relatively) flexible responses to objects in the animals' environments and not merely to specific proximal stimuli. Furthermore, in many of them, the animals are capable of learning new things about those objects that they are interacting with, of extrapolating what has been learnt to new contexts, etc. Arguably, these animals are also capable of improving their ways of discriminating and responding to some objects and its varying properties, etc. Now, the capacity to learn, acquire and integrate new information, the flexibility and versatility of the responses, the possibility of taking some distance (or gaining some independence) from the impinging stimuli, etc., are among the requirements that, according to several philosophers, must be satisfied by non-linguistic animals if we are to credit them with some (basic) conceptual abilities ([3,20,21]). Thus, even though the topic would deserve a more extensive and careful treatment, there are some reasons to conjecture that these could be conceptual (or at least proto-conceptual) creatures and to further explore what kind of concepts and contents are required in order to explain their behavior.

3. Varieties of Undetachability

3.1. The Undetachability of Some Concepts of Particulars from One Specific Property Concept

The first case that I would like to consider is the following one: imagine that there is a creature C who is incapable of thinking about some kind of particulars without thinking of them *as being F*. Provided that **a**, **b** and **c** are the members of the class of particulars in question, each time C deploys her concept of one or another of these particulars, she will not be able to avoid representing them as possessing the property *F*. Thus, each time C deploys a concept such as *a*, *b* or *c*, she will inexorably embed it in a content like: *a is F*, *b is F* or *c is F*. Clearly, such a constraint in C's representational capacities will put a substantive limitation on her abilities to recombine and redeploy concepts. Basically, she will not be capable of thinking about any content which involves representing **a**, **b** or **c**, as having properties different from *F* (like, for example, *a is G*, *b is H*, etc.) at least as long as she does not represent them *as being F* at the same time.⁹ Interestingly, this does not preclude C from detaching her concept *F* from the contents *a is F*, *b is F* and *c is F* and redeploying it in new contexts, attributing it to any other particular entities and forming new thought contents such as *d is F* or *e is F*.

It is important to notice that, despite the fact that C cannot detach concept *a* from concept *F*, when C thinks *a is F*, she is not entertaining an entirely unstructured thought which admits no decomposition into smaller representational units, each with its distinctive and stable representational function. Rather, she seems to be entertaining a thought that has some kind of structure. That is, a thought with a content composed by (at least some) smaller, re-deployable units, with stable representational functions. Basically, this is so for two reasons. Firstly, because it is possible to identify at least one constituent conceptual unit–property concept *F*—that can be detached from this whole content and redeployed in other contents, making always the same stable semantic contribution.¹⁰ However, it is also true that C will not be capable of thinking about **a** without ascribing property *F* to it. In this sense, this is not either a wholly structured content, entirely composed by conceptual units that can be freely detached and fully-recombined.

If these ideas are correct, it seems that what we have here are contents that occupy some sort of previously unexplored middle-ground between holistic unstructured contents and fully-structured ones. These are, if we want to give them a name, “semi-structured” contents, composed by some smaller parts that can be freely decomposed and re-deployed, and other parts that remain irrevocably embedded in the larger contents that they constitute. As it will become clear later on, the same is true, *mutatis mutandis*, for contents constituted by the other kinds of undetachable concepts to be examined below.

Now, what kind of behavior should be expected from a creature when she is deploying these sorts of undetachable concepts of particulars? In addition, do we have any evidence suggesting that there are, indeed, creatures that entertain contents composed by such undetachable concepts?

⁹ This point is tricky. Strictly speaking, in the kind of cases I am thinking about, nothing precludes C from representing **a** as having other properties different from *F*, but only if, at the same time, she also thinks that *a is F*. What she cannot do is to think about **a** as having a different property from *F*, while not thinking about it as also *being F*. This is important since, as some empirical examples below will illustrate, even if some animals seem to be incapable of representing some particulars without simultaneously attributing certain properties to them, they can still represent them as having other properties as well. Thus, assuming that gazelles always represent lions as dangerous, they also seem to be capable, at the same time, of detecting and integrating other relevant properties of lions (as their sizes, how far away they are from them, etc.). My main point here, then, is only that if gazelles are indeed incapable of detaching their representations of lions from their representations of danger, they will be also incapable of entertaining some contents: those in which lions are represented as having other properties while they are not simultaneously represented as being dangerous.

¹⁰ Interestingly, this will allow us, at least in principle, to single out the semantic contribution of concept *a*, even despite *a*'s undetachability from *F*. Why? Because *a* will be making the specific semantic contribution that is absent from all those other contents in which *F* appears combined with other concepts. At least in the case of a simple thought like *a is F*, all we need to do is somehow isolate the semantic information that this content bears, which is both different from the semantic contribution of *F* and absent in all other contents in which *F* is redeployed in combination with other concepts of particulars.

Regarding the first question, one thing that should be expected from creatures that, when thinking about particulars **a**, **b** or **c**, can only think of them as *being F*, is a very specific kind of *cognitive or representational rigidity*. Since these creatures cannot help thinking, for example, of **a** as *F*, one may expect that they will not be capable of changing their way of characterizing **a**, attributing to it different properties from *F*—while at the same time refraining from thinking about it *as an F*—even if they should rationally do so, in light of their other beliefs or available evidence. In other words: these kinds of contents should be irresponsive to disconfirming evidence. Furthermore, since these creatures cannot entertain contents in which *a* is combined with *G*, or *H* (but not *F*), one may expect them to be also incapable of having any other kind of psychological states with such contents. They will not only be incapable of believing that *a is G*. They will be neither capable of imagining, conjecturing, doubting that *a is G*, etc., (and, of course, the same applies to *b* and *c*).

This *cognitive rigidity* will likely have, as one of its consequences, a specific kind of *behavioral rigidity*. Let us assume that believing that *a is F* typically guides *C*'s behaviors in some specific ways, and that, if *C* deploys concept *a* at all, then she is compelled to combine it with property concept *F*. In such a case, we may expect that, each time *C* conceptualizes particular **a** as *a*, the same content—i.e., *a is F*—will be making the same contribution to influence her behavior. Of course, this does not mean that *C* will necessarily act in the exact same way each time she thinks the content *a is F*. Her behavior may still change as a result of her other mental states, of her moods, situation, etc. Nevertheless, her responses to the particular entity **a** will still be much more rigid than those of another creature *C**, capable of representing **a** in other ways, different from *being F*. An example may help to clarify this point: imagine that whenever *C* represents **a**, she must inexorably represent it as *a menace*. Clearly, her behavior towards **a** may still suffer many variations, depending on her other beliefs, desires, fears, etc. Thus, if she believes that *a is a menace* but she also believes that *one should try to avoid menaces as long as possible*, she will presumably behave very differently than how she would act if she believed that *one should face menaces as soon as possible*. Nevertheless, her behavioral dispositions will still be less flexible and varied than those of a creature *C** that is capable of representing **a** as being *harmless, useful, desirable* (and not representing **a** as *a menace* at the same time).

It seems quite clear that this kind of cognitive and behavioral rigidity will have its costs. For example, creatures suffering from it will retain irrational beliefs about some particulars having certain properties, even when evidence should lead them to think otherwise. Besides, they will find it difficult (or even impossible) to adapt to those situations in which the particulars in question have lost the property that they rigidly attribute to them, since they will be incapable of representing such a fact. In addition, they may not be capable of responding adequately in certain situations, as a result of their incapacity to conjecture counterfactual scenarios in which any of these particulars loses the aforementioned property, etc.

Nevertheless, it may still be of adaptive value, for some species, to have a rigid disposition to always represent certain particulars as having some specific property, especially when they live in environments in which it is frequent for these particulars to have the property in question, and when registering such a fact is relevant for their survival. Thus, some animals might, for example, tend to rigidly represent different individual predators as dangerous, no matter which contexts they find them in, or they may always perceive food as desirable, etc. This would allow them to respond in a fast and usually adequate way to the presence of those entities, without wasting valuable time and cognitive resources on representing them as having other properties that may be less relevant, highly unlikely, absurd, etc. Additionally, it may free them from the complex task of having to determine on which properties of a particular to focus on in a given context, which properties this particular actually has in the present moment, etc.

However, are there animals that actually suffer from this incapacity to detach some concepts of particulars from certain property concepts? It seems to me that, in order to answer this question, it is useful to distinguish between two kinds of evidence that might be offered in favor of this hypothesis.

Firstly, one could have evidence that, for all one knows, there are non-human animals that always represent some particular entities as having some specific property. This would be the case, for example, if all the evidence that we had about a species *S* were consistent with members of *S* always treating some particular entities as having property *F*, and nothing indicated that, on the contrary, in some contexts or situations, members of *S* do not represent these particulars as *being F*, but as having other properties. What I would like to suggest is that this would give us some initial, although admittedly rather weak, reasons to conjecture that members of *S* have the kind of detachability and combinatorial limitations that I have described so far. In fact, such a hypothesis would provide an explanation of the fact that they always represent these particular entities *as being F*: because it is impossible for them to do something different. If we endorse this line of thinking, we can turn to the behaviors of many non-human species that uniformly respond to certain particulars in the same way in different contexts and treat them as initial evidence suggesting that these animals suffer from the specific kind of conceptual undetachability that I am describing here.

Let us consider just one example of this kind of evidence: California ground squirrels' abilities to recognize snakes as predators. According to researchers, these squirrels do not require experience with snakes during development in order to recognize their danger. Pups born and reared in the lab without previous contact with snakes distinguish them from novel animate objects. Moreover, they behave in the complex ways adults do towards snakes, that is, flagging their tails, approaching cautiously, investigating in elongated postures, and jumping back [22]. In brief: their behavior shows that very early on, and without previous learning, they consistently behave towards snakes by treating them as dangerous predators.

This does not mean, of course, that the behavior of squirrels towards snakes cannot change with experience and context. As researchers remark, experience is indeed important in the development of subtler aspects of anti-snake cognition. Squirrels learn to distinguish, for example, changes in the body temperature of a snake as a sign of the amount of their dangerousness (as the body of the snakes heat up, the biochemical processes that support their behavior speed up, and they deliver strikes with greater velocity, less hesitation and greater accuracy) [22]. They also respond differently to snakes depending on where they discover them. If, for example, the rattlesnake is found near their burrow, squirrels are more confrontational than when they detect it near someone else's burrow [23].

Nevertheless, the fact that ground squirrels always react towards snakes, even from their first encounter, in a cautious, inquisitive, and evasive/aggressive way, suggests that they always represent them as predators, or as some kind of menace, rather than, for example, as friends, preys, tools, etc. One could further hypothesize that this is due to the fact that they cannot detach the representation of the particular snakes that they interact with from the predicate "predator" (or some other similar concept) that always comes associated with it. If such were the case, this could be a plausible empirical example of the kind of content that I have just described.¹¹

However, from the fact that some animals always think about some particulars as having certain properties it does not necessarily follow that, whenever they think about these particular, they *cannot help* representing them in such a way. Yet, the latter was, precisely, the hypothesis to be tested. Then, it still seems that in order to obtain a stronger support for the claim that some animals, such as California ground squirrels, suffer from the kind of conceptual undetachability sketched here, we would need to acquire evidence that these animals are incapable of changing their way of representing snakes, even when confronted with relevant evidence against it. If, for example, we could arrange an experimental scenario in which squirrels were confronted with harmless snakes, they were shown other creatures playing with them, etc., but they still reacted in a fearful way towards these

¹¹ It should be noted, though, that since squirrels learn new things about snakes, and react differently to them in different contexts, they must also be capable of having thoughts in which snakes are represented as having other properties besides that of being a predator (like being hot, or cold). As seen above, nothing in my proposal precludes that alternative, as long as these more complex contents always include the "threat" or "predator" predicate as well.

predators, this would give us additional reasons to think that they are incapable of detaching their representation of each particular snake that they encounter from a property concept such as *threatening* or *dangerous*.

As far as I know, we lack relevant studies on the capacity or incapacity ground squirrels to stop representing snakes as dangerous in light of relevant evidence. Consequently, we do not have yet strong evidence that whenever these animals face a particular snake they are incapable of detaching their representations of that particular from some specific property concept like: *dangerous*! Still, I would like to suggest that this is the evidence that we should be looking for if we are interested in basing the conjecture that they are incapable of detaching some of their concepts of particulars from specific property concepts on stronger ground.

There is, still, an additional point to consider. Let us suppose that an animal is, at present, incapable of detaching her concept *a* from her concept *F*. Must it be also impossible for her to overcome this limit in order for us to conclude that she suffers from the kind of undetachability that is being discussed here? It seems to me that we do not need to demand so much. Let me roughly explain why.

There are reasons to think that, at least on some occasions, an animal's rigid disposition to think about some particulars as having a specific property might have been acquired, for example, after a process of associative learning.¹² In such a case, one could go on arguing that the rigid link between the creatures' concepts may break after another conditioning process. Arguably, this is what happens even in cases of extremely rigid associations, such as phobias, after behaviorist desensitization therapy. Now, let us focus, to take just one toy example, on a hypothetical subject *S* suffering from a phobia to spiders at a period of time T_1 . It seems reasonable to claim, in such a case, that in T_1 , *S* has a rigid tendency to represent spiders as being, say, *extremely dangerous*. Furthermore, her disposition may be so strong that she is simply incapable of thinking about spiders without thinking about them as *extremely dangerous*, she cannot spontaneously negate that thought, she does not respond to evidence against it, etc. Let us also suppose that, later on, *S*'s situation changes through a conditioning process that puts an end to her phobia. It still seems to me that if during a given period of time T_1 , *S* was incapable of detaching her representations of spiders from the predicate *extremely dangerous* in the way previously described, one may legitimately claim that, despite later changes, during T_1 , she suffered from the kind of undetachability and combinatorial limitations described here. Thus, what this case suggests is that the incapacity of a creature to detach some of her concepts from others, and the limits to recombine the concepts following from it, may be only temporary, but still genuine. *Mutatis mutandis*, this idea can be extended to the other kinds of undetachability described in Section 3.2. and Section 3.3.

Let us now turn to one final objection that I would like to consider. Someone might wonder why I am interpreting these empirical evidence as showing that squirrels' defensive responses to snakes are actually guided by a mental state with a content composed by two different concepts: a concept of the particular snake in question and a concept of a property like: *dangerous* or *threatening*. Why shouldn't one think, instead, that our squirrels are merely forming a simpler holistic representation of a specific kind of danger instead?

Roughly, there are two reasons in favor of thinking that ground squirrels are forming complex mental contents composed by two different kinds of concepts instead of an unstructured representation of a specific kind of danger. On the one hand, squirrels seem capable of treating other animals—like hawks, dogs, golden eagles, etc.,—as dangerous. Since, presumably, their behavior is flexibly guided, in all these situations, by some representation of these different animals' dangerousness, it does seem plausible (and economic) to conjecture that, in fact, they are attributing the same property concept to

¹² Some may doubt that the semi-structured contents described so far could be acquired by a process of associative learning. This kind of skepticism probably stems from an inclination to think that associative learning must necessarily produce associative structures—merely composed by a sequence of concatenated representations and involving no attribution of properties to particulars. However, as Mandelbaum [24] has argued, logically speaking, there are no reasons to bar the possibility that any kind of representational structure may arise from a process of associative learning.

these different particulars (instead of having a separate specific representation of the danger generated by snakes). On the other hand, as mentioned above, they are capable of learning new things about snakes and integrating this new information when dealing with them. In a sense, then, they do not seem, either, to be merely detecting the property of a specific kind of danger out there. Rather, they are detecting and tracking a particular entity: an entity that they always represent as dangerous, but which is also something more than a mere kind of danger to them.

3.2. The Undetachability of a Specific Property Concept from Some Concepts of Particulars

What I will examine now is the inverse incapacity from the one presented in Section 3.1. What happens in this second situation is that a creature *C* is incapable of putting to use a property concept *F* without representing *F* as a property of a specific particular such as *a*. In this case, each time our creature deploys property concept *F*, she must necessarily do it by combining *F* with concept *a*. Thus, *C* will not be capable of detaching *F* from *a* at all and, consequently, she will not be capable of entertaining concepts such as *b is F* or *c is F*. However, of course, she will still be able to combine her concept *a* with other property concepts in all kinds of ways.

Once again, it seems that these are semi-structured contents in which it is possible to identify two basic components—*a* and *F*—with different semantic functions. Basically, this is so because one (and only one) of these constitutive elements (concept *a*) can be freely detached and recombined, while the other (concept *F*) remains embedded in the original larger content *a is F*. In addition, one may also expect to find here a representational and behavioral rigidity similar to the one described in Section 3.1. In this case, creature *C* will not be capable of attributing property *F* to any particular different from *a*, even when she should do so, given the available evidence. In turn, since each time she deploys concept *F* she will do it by entertaining a content such as *a is F*, her behavior will always be influenced by such a content, and never by contents such as *b is F*, *c is F*, etc. Presumably, this should have a restrictive impact on the kind of behaviors that she may manifest.

What about the explanatory credentials of positing this second kind of detachability limitations? It seems to me that, in general, this rigid disposition to combine a given property concept with a specific concept of a particular could be useful when the following conditions are met. Firstly, when there is a reliable correlation between the presence of property *F* and the presence of particular *a* as the bearer of *F*. Secondly, when in order to deal with their environments, it is particularly relevant, for some animals, not only to register the presence of property *F*, but also to be prepared to deal with the situations in which a specific particular, such as *a*, is *F*.

Thus, for example, a certain noise *N* may indicate many disparate things, in different counterfactual scenarios. Now, it may also be true that, in the environment of creature *C*, this noise is usually produced by a particular animal *e*, an enemy of *C*. In addition, it might be especially relevant for *C* to get prepared, whenever she detects *N*, for the possible presence of that specific enemy. In such a situation, having a rigid disposition, when detecting *N*, to think that *e is producing N*, might result a valuable tool for *C*.

This kind of undetachability may help us to explain some empirical evidence on the way in which some animals keep track of specific individuals in their environments. It might be useful, for example, to explain extant evidence of signature vocalizations that allow animals from different species to communicate information about their individual identities to other members of their group. Among these individually distinctive signals, one may include the squeaks of adult timber wolves [25], the calls of sub-Antarctic fur seal pups [26], the calls of bank and cliff swallow chicks [27], etc.

According to researchers, signature vocalizations fulfill a variety of functions. In some animals, they allow the mutual recognition of parents and offspring. To focus on just one example, after giving birth, sea fur seal mothers must go to the sea to feed and to build nutrient reserves for lactation. Once they return to land, they need to reunite with their pups. However, in order to be able to do this, both the mother and the pup must be capable of recognizing each other among their conspecifics. That seems to be the evolutionary reason they both develop their own signature vocalizations [26,28].

What I would like to suggest, in addition, is that one way to explain how these signature vocalizations accomplish their function is by claiming that the receptors of such signals have a rigid and automatic tendency to link them to one and only one individual. Consequently, when hearing, for example, the signature vocalization of her mother, the pup cannot avoid entertaining a content such as *mum is calling*₁.¹³ This rigid link between the representation of a specific signature vocalization and a particular individual would explain the effective way in which the former fulfills its singularizing function.¹⁴

Of course, a skeptic may legitimately ask, at this point, why should one attribute to these animals a complex content such as *mum is calling*₁, composed by a concept of a particular and a property concept, instead of attributing to them a simpler unstructured representation such as “mum”? In a nutshell, the answer is that we may presume that the pups will also be capable of tracking and recognizing their mothers as the same individuals even when they are not calling them but, instead, behaving in other ways. If this is indeed the case, such a capacity will be manifested in two features of their response to these different situations. On the one hand, they must show (in the familiarity of their behavior towards their mothers, in the way in which they integrate different information acquired in the past about them, etc.), that they recognize or re-identify their mothers in their different encounters with them. On the other hand, they must also show, in the versatility and variances of their responses to these same individuals in these different situations, that they are sensitive to the fact that they have different properties, act in different ways, etc. Now, if pups do have this capacity, it seems that what we need, in order to explain the variances and invariances of their responses to their mothers in all these situations, is to attribute to them different contents in which the same mother is represented as having different properties (like *mum is calling*, *mum is asleep*, *mum is eating*, etc.).

Now, strictly speaking, what this evidence suggests is that, when animals such as seals hear certain sounds, they always associate them with a particular individual, even when they have no perceptual access to that individual at the time. However, once again, this only gives us weak evidence in favor of the existence of a specific conceptual undetachability of certain properties from certain concepts of particulars. One can interpret the empirical evidence as indicating that these animals have a strong tendency to link some representations of properties with specific representations of particulars. However, as happened in Section 3.1., it can be argued that what we need to have is a different kind of evidence: evidence not only that, for all we know, certain animals always think about some properties as the properties of the same particulars, but also evidence that they are not capable of combining these property concepts with concepts of other individuals, even when they have good reasons—like, for example, being faced with relevant evidence—to form these new combinations. Until we have this further evidence, our conjecture is a very tentative one. Nevertheless, for the reasons given above, it deserves further exploration.

3.3. The Undetachability of some Concepts of Particulars from the Determinate Property Concepts Belonging to a Determinable Class

The last kind of undetachability that I am going to present is, clearly, the weaker one. Consequently, it is also the one that imposes less restrictions to the ways in which a creature may combine her concepts. What happens in this more lenient case is that each time a creature C deploys a concept of a particular from a specific group (e.g., *a*, *b* and *c*), she is inexorably compelled to combine it with one or another of the property concepts belonging to a determinate range ($F_1 \dots F_n$).

¹³ I am using “calling₁” to refer to that specific signature call that the mother of the pup (and only her) can elicit.

¹⁴ Bottlenose dolphins also produce individuating signature whistles. Now, dolphins can copy the signature whistles of others, and use such mimicking to label and address their social companions (even though they do this very rarely). Moreover, dolphins occasionally respond to hearing their own whistles (elicited by others) by calling back with the same whistle type [29]. Such flexible use of signature whistles suggests that dolphins who hear a signature whistle need not attach it inexorably to the same individual caller.

It may be of help, in order to clarify what this last kind of undetachability consists in, to introduce a well-known logical distinction between two kinds of property concepts: *determinate* and *determinable* ones. Roughly, determinable property concepts are higher-level concepts that have other concepts—determinate ones—as their sub-species. To mention a paradigmatic case, *color* is a determinable concept, while *blue, red, yellow, etc.*, are the determinate concepts falling under it [30]. Pure determinate concepts, in turn, are such that no other determinate concept is subsumable under them [31].

With the determinable/determinate distinction in hand, it is possible to characterize the kind of cases that are being examined as having the following general structure: a creature C has some concepts of particulars (like *a, b, c*) and, whenever she thinks about any of them, she rigidly tends to combine it with one or another of the different determinate concepts which are subsumed under a certain determinable property concept *D*. Alternatively, it could be claimed that the determinable concept *D* fixes the range of determinate concepts that C can combine her concepts of particulars *a, b* and *c* with.

Clearly, in this kind of case, C will be capable of representing a particular, such as *a*, as having one or another of the corresponding determinate concepts that fall under determinable concept *D*. In this sense, her concept *a* will be detachable from any specific determinate concept that one may choose. However, it will be not possible for C to detach *a* from every determinable concept that fall under determinable concept *D*. Hence, she will not be capable of thinking about *a* as having any other properties different from the ones that can be subsumed under *D* (at least without also attributing to *a* one or another of the determinate concepts falling under *D*).

Following a similar argumentative line to the one employed in Section 3.1., it could be argued that it may be of adaptive value, for some species, to count with a rigid disposition to represent some particulars as having one or another of the determinate concepts that fall under a specific determinable one. This may be what happens, for example, in the case of an animal that cannot avoid thinking about particular items of food as *fresh or rotten*, about particular preys as *strong or weak*, etc. Such an innate tendency to attribute to certain particulars one or another property concept belonging to a specific determinable range may be of use to ensure that, in normal conditions, they register and focus on the aspects of those particulars that are the most important to enhance their possibilities of reproduction and survival. In other words, such a rigid link between the representation of some particulars and the attribution of one or another property from a limited class to them, will guarantee that these animals provide an answer, in their thoughts, to questions that might be relevant for their survival, like: Is this edible? Is this dangerous? In addition, animals with such tendencies will avoid wasting both time and cognitive resources selecting, among a much wider range of possibilities, which important properties to focus on when dealing with specific particulars, etc.

Let us now turn to the question of whether there are animals who actually suffer from these limitations to detach and recombine their concepts. In a recent paper on baboon's ways of conceptualizing other individual members of their group, Cheney and Seyfarth [32] remind us that Old World monkeys live in societies where their possibilities of survival and reproduction depend, to a large extent, on their social abilities. What they suggest is that these kinds of contexts "have favored individuals who can recognize other animals' social attributes and treat these properties as inextricable parts of an individual's identity" (italics are mine) [32] (p. 57). To illustrate this general idea, they focus on how female baboons recognize two kinds of social properties in other members of their group: their social rank and their kinship. According to them, rank and kinship are "social concepts" or "representational primitives" that these female baboons possess. Knowing the rank and kinship of the individual members of their group is of vital importance for baboons, since it is the best way to predict their behaviors and it is essential to forming the kind of stable and enduring bonds that lead to high reproductive success [32] (p. 60). Now, what different experiments show is that when a baboon hears another one vocalize, the listener encodes information about the caller's identity (i.e., about *who* is

emitting the call), but also about her dominance rank and family membership. Interestingly, they add that this encoding is both immediate and automatic. In fact, according to them:

“... just as we cannot hear a word without thinking about its meaning, a baboon cannot hear a vocalization without thinking about the animal who is calling, what she looks like and her rank and family membership” [30] (p. 61).

Now, other evidence suggests that this automatic categorization of individuals according to rank and kinship takes place not only when a baboon hears the calls of other baboons, but also when they interact with them in all kinds of ways. In this line, Cheney and Seyfarth make the following general claim:

“Individual recognition, then, is more than just recognition of an individual. It includes the recognition of that individual’s place in society” [32] (p. 61).

I find Cheney and Seyfarth’s claims about how baboons represent other individual members of their group to be congenial with the idea that these animals have the kinds of semi-structured contents that compel them, whenever they represent other individual members of the group, to think of them as having a determinate position in the social hierarchy and as belonging to a certain family. If this is right, baboons’ thoughts about other baboons will always have to include the attribution of one of several concepts of determinate properties: those related to different positions in the social hierarchy, or to different family memberships.

Baboons’ societies are dynamic, and ranks may change over time (especially in the case of male baboons). Moreover, baboons are, for all we know, experts at tracking those changes. Thus, at least when they are representing the social rank of other individuals, they may need to attribute to them different ranks at different moments in time. Nevertheless, they may well be incapable, as Cheney and Seyfarth claim, of representing these individuals and of identifying them without attributing to them some rank or another. If this were the case, the notion of content sketched here might be just what we need to account for the specific ways in which they track and represent other group members and (some of) their social properties.

4. Conclusions

Tradition in Philosophy has tended to distinguish neatly between propositional and non-propositional contents. Now, there are many different alternative ways of understanding these notions. According to the most deflationary use of the term, a content is propositional if it represents things as being in a certain way and can be evaluated as true or false or, more leniently, as correct or incorrect. A more robust notion requires, additionally, that propositional contents have sentential structures and that they are composed by stable conceptual units that can be freely detached and recombined in every admissible way, satisfying a full-blown version of Evan’s Generality Constraint.

Now, imagine that someone adopted the robust notion of propositional contents recently mentioned, and came to think, in addition, that the only other kind of content that we need to posit are unstructured, non-propositional contents, lacking all the characteristic features of full-blown propositional ones: such contents should be non-conceptual, they must have no truth conditions and they should admit no decomposition into more basic constituent units. My first and central aim in this paper has been to defend, against such a view, that there is conceptual space for (at least) another kind of contents, occupying a middle-ground space between these two extreme alternatives. These are semi-structured contents, composed by constituent representational units—concepts of particulars and properties—that do not satisfy the more demanding versions of GC for a very specific reason: it would not be possible for the creature entertaining such contents to freely detach some of their constituent concepts from others. Like robust or full-blown propositional contents, these semi-structured contents represent things as being in certain ways, and they have correctness conditions. Moreover, it seems possible to identify different representational or conceptual units composing these contents and making

a distinctive contribution to them. Nevertheless, unlike full-blown propositional contents, they have, among their constituents, one conceptual unit that cannot be freely detached from all others.¹⁵

Once I had accomplished the initial conceptual task of providing a general characterization of these semi-structured contents and its constituent concepts, I went on distinguishing some ways in which one concept may be undetachable from others, failing to satisfy what I had called the Detachability Constraint. Additionally, I argued that each of them leads to specific restrictions in the kinds of conceptual re-combinations that they admit. Finally, I took some tentative steps in order to show the empirical plausibility and heuristic value of the idea that there are animals that possess some concepts which do not satisfy the Detachability Constraint, and some semi-structured contents partially composed by them. Firstly, I argued that there are reasons why it would be adaptive for some animals to have these kinds of concepts. Secondly, I suggested which sort of empirical evidence we should be looking for in order to strengthen the conjecture that some species do, indeed, suffer from the detachability and combinatorial limitations distinguished in this paper. Admittedly, these are only initial and tentative steps, but I think they can help us see both undetachable concepts and semi-structured contents as theoretical tools that deserve further exploration.

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¹⁵ But, one may still insist: should these semi-structured contents be classified as propositional or as non-propositional? I think the answer to this question will depend, once again, on how the notion of “propositional” is understood. If we take it in a minimal sense, according to which a propositional content is merely a content that has truth conditions and represents things as being in certain ways, semi-structured contents would clearly count as propositional. But if we adopt the full-blown notion, they would not qualify as such. Moreover, it is an open question if there are other relevant features—besides the limits to detach and recombine some of their constituent concepts that we have examined—which differentiate semi-structured concepts from full-blown propositional ones.

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