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TROPE THEORY AND ATOMIC OBJECTS

Abstract. This note presents an argument to show that trope theory, as usually conceived, gets into difficulties in handling certain ways in which two objects can resemble one another. Ways out of the difficulties are discussed briefly.

Keywords: Tropes, properties, resemblance.

John is happy. So is Jenny. That is good, but how are we to explain the apparent fact that several different objects, perhaps separate in time and space, can share one and the same property? This problem—a version of the old “one-over-many problem”—has a long history. The traditional contenders were various forms of realism concerning universals and nominalism. Problems with those two positions are by now well rehearsed. A third option, trope theory, is a relative newcomer, even if it can trace its roots back to Aristotle, Locke, Leibniz and Husserl. Trope theory is set out as an alternative to the more well-known antagonists realism and nominalism. It differs from both in its structure. According to a classical realist theory of properties, for instance, if there are three white balls, *a*, *b*, and *c*, there are three individual substances, three objects, that share one and the same property, which is divided among the three individuals. How this “sharing” is supposed to take place is never explained properly. So trope theory comes across as a tempting alternative. Instead of postulating one universal, the trope theorist thinks of the above situation as one where we have three particularized properties, three individuals, the whiteness-of-*a*, the whiteness-of-*b*, and the whiteness-of-*c*. The three balls are all white,

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because these three whiteness tropes all are related by *exact resemblance*. Tropes can be connected in two different ways. First, there is the relation of exact resemblance or similarity. Exactly similar tropes can form a set, $Sim\{F\}$, the similarity set of F -nesses of tropes, so the whiteness of my shirt, and the whiteness of ball a are both part in the set of similar whiteness tropes. Second, various tropes can coexist in the same place at the same time, making up an object; this makes up the *concurrency set*, $Con\{a\}$. The whiteness of a , the roundness of a , and so on, together make up the particular concrete white ball in the corner.

D. C. Williams, one of the pioneers of trope theory, held that tropes are the building blocks of all existing—in fact all possible—objects.¹ Tropes can be seen as instances of a quality, such as the whiteness of the ball, its roundness, and so on. These quality instances together serve to make up the ball. So tropes are neither concrete particulars (ordinary objects) or universal properties. They are usually characterized in the following way: They are *abstract* and they are *particulars*.² They are the “alphabet of being”—they are those things from which all other objects are constructed. Tropes make up all possible objects, but tropes are not constructed out of anything else (though they can, at least in some instances, be constructed out of other tropes).

So according to the trope theory of properties, a sentence like “John is happy” is not in the end to be analysed as attributing a property, shareable by many objects, to an object, which can have several different properties. Such sentences should instead be analysed with the use of tropes.³ A trope is an abstract particular, in this case the happiness of John. Then the original sentence is true iff that trope is an element of the concurrency set of John (explaining why we are talking of John’s happiness), and also is an element in the resemblance set of happiness tropes (explaining why John can be happy, and why he can share that property with Lisa). So we have two relevant sets here: the set of tropes concurring to make up one individual object in one particular place (John’s tallness, John’s happiness, John’s colour, and so on), and the set of tropes that are exactly similar in some respect (in this case, the happiness tropes).

¹See [4], p. 115: “[Tropes] are the primary constituents of this or any possible world, the very alphabet of being.”

²Hence the title of Campbell’s [2].

³For trope theories of properties, see for instance [2] and [4].

Tropes are to be truth-makers for sentences, useful for giving truth-conditions of a subject-predicate sentence such as “ a is F ”. “ a is F ” is analyzed in the following way:⁴

- (1) “ a is F ” is true iff there is a trope b such that b is an element in the intersection of $Con\{a\}$ and $Sim\{F\}$

John is happy if and only if there is a trope which can be found in both the set of tropes making up John and in the set of tropes comprising all the happinesses in the world.⁵ The similarity class for a predicate will itself be one of the things composed of tropes, which we could formulate as the following axiom, holding for any predicate F :

- (2) If there is a trope b such that $b \in Sim\{F\}$, then $Sim\{F\} \subseteq Sim\{\text{composed of tropes}\}$

Now consider the sentence “ a is not composed of tropes”—which in effect says that a is an atom, perhaps the ultimate trope, which does not consist of other tropes. Then the truth conditions for that sentence would be:

- (3) “ a is not composed of tropes” is true iff it is not the case that “ a is composed of tropes” is true

which gives us

- (4) “ a is not composed of tropes” is true iff it is not the case that there is a trope b such that b is an element in the intersection of $Con\{a\}$ and $Sim\{\text{composed of tropes}\}$

If something is not composed of tropes, it is simple and unstructured, and therefore atomic. So the property *not being composed of tropes* can also be expressed as *being atomic*. Therefore we have the equivalence

⁴See [1] for an analysis along these lines.

⁵We might ask—in fact, an anonymous referee asked—whether it really is in order to think of these combinations as sets, and the relations between the individual tropes and the combinations as the relation of *being an element in the intersection of $Con\{a\}$ and $Sim\{F\}$* really is the same relation as that of set-theoretic membership. It seems probable that some kind of mereological parthood relation is a better description of the kind of relation that is at stake here; after all, we don’t find it very natural to think of ordinary objects as *being* sets. For a simpler exposition, the main argument in the text is conducted in terms of the set-theoretic membership relation, whereas I in the Appendix discuss how the argument is to be transposed into a different kind of parthood relation.

- (5) “ a is atomic” is true iff it is not the case that there is a trope b such that b is an element in the intersection of $Con\{a\}$ and $Sim\{\text{composed of tropes}\}$

or we could try for a direct analysis of what “ a is atomic” might mean:

- (6) “ a is atomic” is true iff there is a trope b such that b is an element in the intersection of $Con\{a\}$ and $Sim\{\text{atomic}\}$

Assuming that “ a is atomic” is true, we obtain by (5) that it is not the case that b is an element of the intersection of $Con\{a\}$ and $Sim\{\text{composed of tropes}\}$. But by (6) and (2), we get

- (7) there is a trope b such that b is an element in the intersection of $Con\{a\}$ and $Sim\{\text{composed of tropes}\}$

So we get a contradiction if we assume that “ a is atomic” is true; we are forced to say both that something is and that it isn’t composed of tropes.

How bad is this result? At the very least, this shows that trope theory cannot account for all types of resemblance. Trope theory may be able to account for what resemblance amounts to in the case of whiteness or happiness, but it will not work for saying how two atoms resemble one another, what makes it the case that two things both are atoms. So it will not be *the* explanation of resemblance or the truth of predications—some other theory is needed in addition to trope theory. But this will mean that resemblance and predication remain fundamentally unexplained by trope theory.

There is another way out for trope theories, and that is to say that the above reasoning simply shows that there are no atoms in the sense required for the argument to go through. Everything is composed of tropes, *ad infinitum*. This blocks the reasoning, but there is more than a hint of *ad hoc*-ness about this suggestion. If we are not given independent positive reasons for saying that everything must be composed of tropes all the way down, as it were, then it would appear that the suggestion disallows an apparently *bona fide* predicate like *being atomic* just because it leads to difficulties for the trope theory.

Therefore this second option appears less promising. So let’s get back to the first alternative. It would appear that at least the notion of *being an atom* is problematic. Perhaps there is some way to isolate the problems with atomicity so that they don’t spread, and infect the very notion of tropes. One option would be to hold that it is a given primitive, not to be handled

by trope theory. Of course explanation must come to an end somewhere, not everything can be explained in terms of something else. Some readers might think of this as another *ad hoc* move, since the main reason for stipulating that atomicity is primitive appears to be that it gets us out of trouble. There may be something to this charge, but I think that the main problem with the suggestion is that it leaves us baffled with what it might be that makes different things atoms—in virtue of what are two things atoms, whereas two other things are not? If it's just some kind of brute, inexplicable fact that *a* and *b* are atoms, whereas *c* and *d* are not, the whole project of explaining what it is that makes talk of various properties being had by various objects is in jeopardy, since we don't seem to have advanced from the original, unsatisfactory, problem and its traditional proposed solutions.

A third option is to try to retain the notion of atomicity, try to explain it in terms of some other terms, and in this process try to distinguish various senses of atomicity, and, implicitly, parthood. As mereologists have known for a long time, the notion of something being a part of something can be developed in quite different ways. Perhaps the trope theorist should be saying that the above argument (1–9) isn't problematic, because there simply is no sufficiently clear and univocal sense of “atomic” and “part”, so the derivation of the contradiction in (9) doesn't go through. As far as I see, this kind of move appears to be the most promising. There really is some unclarity with the notions of atomicity and parthood, and perhaps the reasoning (1–9) above rides roughshod over some different notions. Perhaps there are some relevant senses of “atomic” and “having parts” such that something can be atomic in one sense while having parts in another, and any argument along the lines of (1–9) can be shown to trade on some kind of ambiguity in the terms involved. Perhaps, but this would have to be shown.

So the above result seems to be bad enough for now, forcing the trope theorist back to the drawing board, and the general notion of resemblance still needs to be explained. As long as we are not told how the common atomicity of two atomic objects is to be explained or characterized, we are not much better off than we were before the foray into the territory of trope theory.⁶

⁶Thanks to an anonymous referee for valuable comments on an earlier version of this paper, leading to a clarification and improvement of the main argument.

Appendix

But is it really a good idea to think of the various relations between tropes and the things they are part of, the concurrence and resemblance sets, as being fully a set-theoretic membership relation? Would it not be more natural to think of the relations in term of mereological parthood? In the main text, I stayed with set-theoretic notions, mainly because they provide a more straightforward exposition of the problems. In this Appendix, I show how it is possible to transpose the argument of the main text into mereological vocabulary. There is one aspect of this transposed argument which is less clear, and I discuss this unclarity below.

First we have the claim that predication is explained by trope theory, understood in mereological vocabulary:

(1*) Fa is true iff $\exists x (PxCon\{a\} \wedge PxSim\{F\})$

i. e. Fa is true iff there is something, a trope, such that it is part of both the Concurrence set for a and the Similarity set for F . Perhaps it should be more in keeping with mereological terminology to speak of the “concurrence whole” and the “similarity whole”, but I will use the same terms here as in the main argument. The clause for handling negation should be the same as before:

(2*) “ a is not composed of tropes” is true iff it is not the case that “ a is composed of tropes” is true.

To say that something is composed of tropes is to say that it, in some sense of mereological parthood, has tropes as parts. Thus we get

(3*) “ a is not composed of tropes” iff it is not the case that there is a trope b such that b is a part of the mereological overlap of $Con\{a\}$ and $Sim\{composed\ of\ tropes\}$

If something does not have tropes as parts, it is atomic (given the trope theorists’ claim that tropes are the primary existents, the “alphabet of being”—there will be nothing simpler making up the tropes). So we have

(4*) “ a is atomic” is true iff it is not the case that there is a trope b such that b is a part of the mereological overlap of $Con\{a\}$ and $Sim\{composed\ of\ tropes\}$

or the direct analysis

- (5*) “ a is atomic” is true iff there is a trope b such that b is a part of the mereological overlap of $Con\{a\}$ and $Sim\{atomic\}$, $\exists x (PxCon\{a\} \wedge PxSim\{atomic\})$

This follows, since “ a is atomic” is of the form “ Fa ” and therefore should be given an analysis as in (1*). If we combine (4*) and (5*), we get

- (6*) There is a trope b such that b is a part of the mereological overlap of $Con\{a\}$ and $Sim\{atomic\}$ iff it is not the case that there is a trope b such that b is a part of the mereological overlap of $Con\{a\}$ and $Sim\{composed\ of\ tropes\}$

and so forth, enabling us to derive the same kind of problem as in the main text. Now there is some unclarity here, concerning the use of *parthood* and *atomicity* in the argument. Since there are so many different notions of parthood being studied in mereology, there may be some relevant sense in which something can be atomic and yet have parts, or *vice versa*. In that case, (4*) will for instance not hold. But it is by no means clear that this possibility really is open as a way to understand trope theory. This is because the trope theorist wants to insist that all other ontological categories are to be understood in terms of these simples. Saying that tropes are to be seen as the alphabet of being would mean that they are the letters, out of which the words are constructed, and in the sense that is relevant, letters don’t have parts. Hence, there is at least a *prima facie* case for saying that the argument in this Appendix goes through when transposed to mereological vocabulary.

References

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