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Dispositional Monism and the Circularity Objection

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Abstract Three basic positions regarding the nature of fundamental properties are: dispositional monism, categorical monism and the mixed view. Dispositional monism apparently involves a regress or circularity, while an unpalatable consequence of categorical monism and the mixed view is that they are committed to quidditism. I discuss Alexander Bird's defence of dispositional monism based on the structuralist approach to identity. I argue that his solution does not help standard dispositional essentialism, as it admits the possibility that two distinct dispositional properties can possess the same stimuli and manifestations. Moreover, Bird's argument can be used to support the mixed view by relieving it of its commitment to quidditism. I briefly analyse an alternative defence of dispositional essentialism based on Leon Horsten's approach to the problem of circularity and impredicativity. I conclude that the best option is to choose Bird's solution but amend the dispositional perspective on properties. According to my proposal, the essences of dispositions are determined not directly by their stimuli and manifestations but by the role each property plays in the structure formed by the stimulus/manifestation relations.

Keywords Dispositional monism · Categorical monism · Circularity · Structuralism · Quidditism

Dispositional monism (DM) is the thesis that all (sparse, fundamental) properties have dispositional essences, which means that the essence of any property involves at least two further properties: stimulus and manifestation conditions. Dispositional monism is to be contrasted with categorical monism (CM), which is the claim that all properties are categorical, and the mixed view (MV), according to which some properties are dispositional and some categorical. One of the strongest challenges to DM is the regress/circularity objection, which can be outlined as follows. It is argued

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that the identity of dispositional properties can never be properly determined, for in order to identify a property P we have to determine its stimulus P_1 and its manifestation P_2, as P is essentially the power to instantiate P_2 when P_1 is instantiated. However, the stimulus and the manifestation themselves are dispositions too, and hence have to be identified by their respective stimuli and manifestations P_{11}, P_{12} and P_{21}, P_{22}. Clearly, this procedure leads either to an infinite regress or to circularity, the latter one occurring when one of the elements in the descending sequence of properties turns out to be identical with an earlier element in the sequence. From this fact, critics of DM derive the conclusion that the identity of properties can never be determined (Lowe 2006, p. 138; Robinson 1982, pp. 114–115). On the other hand, both CM and MV easily avoid this problem. CM assumes that the (transworld) identity between properties is a primitive notion, while MV divides properties into those whose identities are primitive (categorical properties) and those whose identities can ultimately be reduced to the identities of categorical properties (dispositions). In MV, categorical properties serve as the grounding of identities for dispositions, without leading to circularity or infinite regress.

Alexander Bird has proposed an ingenious method of tackling the challenge posed by the regress/circularity objection (Bird 2007a, pp. 138-146; Bird 2007b). Firstly, he decides to choose one horn of the regress-or-circularity dilemma. Arguing that an infinite regress is not acceptable, since it is very unlikely that there could be an infinite number of fundamental properties, he chooses to adhere to the circularity scenario. His main claim is that despite the circularity the identities of properties can be determined when certain conditions are satisfied. The crucial thesis on which his method relies is that the identity and distinctness of the elements of a set can in some cases supervene on the structure consisting of the set and some relations among its elements. In the case of properties, the relevant relations are those between a property and its manifestation and stimulus. It turns out that if a structure consisting of properties and the manifestation and stimulus relations has no non-trivial automorphisms (meaning that the only automorphism of the structure is the identity operation), then it can be claimed that the identities of the properties are determined by the relations the properties stand to each other (Dipert 1997).

To illustrate this fact, it is convenient to resort to graph theory, where elements of a set are represented by vertices and the relations between them by edges that have directions. On the diagram below (Fig. 1), we have four vertices (representing properties) that are connected by arrows (representing the manifestation relation). For simplicity's sake the relation between dispositions and their stimuli is omitted. It can be easily verified that the only transformation of vertices that leaves the entire structure intact is the trivial identity operation. This fact can be interpreted as follows. In every possible world, properties represented by the vertices have to stand in precisely the same relations to other properties, since possessing a given manifestation is an essential second-order feature of dispositions. Thus, the overall structure of manifestation relations will look the same in all possible worlds. But now we can see that because of the asymmetry of the graph, the question which vertex in a given possible world is identical to which vertex in the actual world has a unique answer. Hence the identity of the properties is fixed by the places they occupy in the overall structure, despite the fact that the chain of connections between

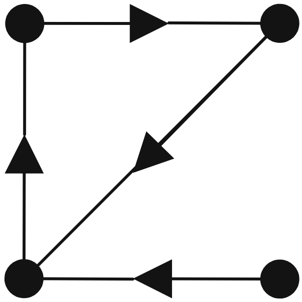

Fig. 1 Asymmetric graph containing only dispositional properties

them is clearly circular. Circularity does not seem to pose a serious threat to identification, after all.[1]

The solution proposed by Bird nicely dispels the worry that a dispositional monist will be unable to properly identify and discern individual properties understood as powers. However, one may observe that by accepting the structuralist solution to the problem of identity we are taking one step away from the initial motivation behind dispositional monism, which was that ultimately what makes a particular property distinct from other properties is its own manifestation and stimulus. The shift is in our understanding of what truly grounds the identity of a given dispositional property: the initial intuition was that it is its power (represented by the manifestation and stimulus) that does the job, but now it is suggested that the identity is determined by the place the property occupies in the whole structure consisting of other properties and their mutual manifestation and stimuli relations. But, as I will argue below, these two views are not equivalent. Bird is aware of this apparent problem, for he mentions one possible constraint on admissible graphs that could ameliorate the situation. It may be argued, given the initial exposition of DM, that what truly grounds the identity of a property *P* is the properties that 'participate' in *P*'s manifestation and stimulus, and not the properties in whose manifestations and stimuli *P*'s participate. To do justice to this intuition Bird suggests to make a distinction between the part of the graph that lies 'downstream' from *P* and the part that lies 'upstream' (Bird 2007a, pp. 143–144). The downstream subgraph for a given vertex *P* is the set that contains *P* and all vertices to which we can get from *P* following the arrows. The additional constraint is that no two different vertices should have non-trivially isomorphic downstream subgraphs (i.e. subgraphs that are isomorphic but not identical). But it remains to be seen whether this restriction can achieve the required objective.

[1] Hannes Leitgeb and James Ladyman in (2008) go further and claim that identity and difference of vertices is fixed even in graphs that are symmetric, as a matter of 'brute' fact. They agree with the structuralist slogan that individuality of separate nodes is exhausted in the relations that the nodes bear to each other, but they insist that the identity and difference of nodes should be counted among their relations (p. 393). Consequently, even the simplest graph consisting of two nodes with no edge between them determines the fact that there are two distinct objects, and not one. However, we have to differentiate between numerical identity in a given world and transworld identity. It is true that in a two-node graph we have two distinct objects, but when we consider another possible world containing exactly the same structure, there is no way of telling which node in this world is identical with which node in our world. And I take it that in order to identify a particular dispositional property we have to be able to find its unique counterparts in at least some possible worlds. This, as I have argued, can only be achieved when the graph in question is asymmetric.

To begin with, let us notice that even with the above constraint in place it is possible to have a graph with two distinct properties possessing exactly the same manifestation. Actually, the graph we used above can serve as an example. Arcs leading from the two vertices on the right-hand side converge on the same vertex, and yet the condition imposed on the downstream subgraphs is satisfied, for the downstream subgraph containing the upper-right vertex is not isomorphic with the subgraph containing the lower-right vertex. This situation may come as a surprise, but it can be explained by the fact that subgraphs are usually circular, and thus they can 'return' to one of the initial vertices but not to the other, and this breaks the symmetry between the subgraphs.

But now we have to observe that it is highly unintuitive, if not outright inconsistent, to admit two numerically distinct objects with precisely the same essences. Essences of individual objects are usually understood in a way which implies that possessing the essence of x is a sufficient condition for being numerically identical with x. One may try to use a weaker notion of essence here, which would serve as a necessary condition of identity only. Of course in order not to trivialise the notion of essence, we have to interpret identity as either diachronic or transworld. Thus we could say for instance that the essence of x is the set of properties S possessed by x such that all transworld copies of x possess all S. But it still doesn't sound right for a dispositional essentialist to admit that for a given property P in the actual world there may be another property Q in some possible world having the same powers as P and yet numerically distinct from P. What fact could explain this difference? It looks like the strategy that was supposed to rescue dispositional essentialism from the regress/circularity objection actually begins to erode its very foundations.

One may think that a way to correct the problem would be to modify the definition of the downstream subgraph of a given vertex P so as not to automatically include P in it (unless it is possible to get from P back to P, of course). But this wouldn't help. True, now the two downstream subgraphs on the diagram above are isomorphic, but notice that this is a trivial isomorphism via identity. But why insist that only non-trivial isomorphisms should be eliminated? Why not exclude identical downstream subgraphs too? The answer is that in an asymmetric graph in which it is possible to get from any vertex to any other vertex, all downstream subgraphs are identical with the entire graph, and we do not want to exclude a priori such cases. Hence, it looks like there is no easy way to avoid the conclusion that two numerically distinct properties can nevertheless have the same essences.

It has to be admitted that Bird makes a distinction between two interpretations of dispositional monism that could help accommodate the problem considered above. The weaker interpretation of dispositional monism claims only that properties *possess* dispositional essences, while the strong interpretation (SDM) adds that properties *consist* of essential powers (Bird 2007a, p. 73). Thus weak dispositional monism is committed to the statement that a given property has the same essential powers in all possible worlds, while SDM adds to this thesis that there are no numerically distinct properties which could have the same dispositional essences in different possible worlds. The fact that there are asymmetric graphs in which two properties have the same manifestations and dispositions violates SDM but not dispositional monism in its weaker form. But Bird himself gives a powerful argument against the possibility of two numerically distinct properties with the same dispositional essences. First he notices that if we accept that there are two different possible worlds such that one contains a property *P* with some dispositional essence, while the other contains a numerically distinct property *Q* with the same essence, then we can create a third possible world that will contain *P* and *Q* having the same dispositional essence. But this means that *P* and *Q* would be effectively undistinguishable and that we could never know whether our world is such that ordinary dispositional powers admit numerically different realisations or not. Hence it looks like dispositional monism is a much more attractive position when it's cashed out in its stronger version SDM.

The shift of balance from the essences of properties understood directly as their powers to the criterion of identity using their positions in the entire structure of the manifestation and stimulus relations is not necessarily a step in the wrong direction. It retains some of the spirit of the original formulation of dispositional monism while modifying its letter. In this new approach, it is still true that the relations which hold between properties and their manifestations/stimuli determine the identity of the properties, but they do this as a whole, not individually. Thus, instead of opting for SDM we could propose an alternative metaphysical view on properties that follows directly from the structuralist solution to the regress/circularity objection. This view, which may be dubbed relational dispositional monism (RDM), claims that the essence of a property is determined by the whole web of manifestation/stimulus relations that this property participates in. If the relational structure consisting of all properties satisfies the condition of asymmetry (no non-trivial automorphisms), then there can be no two numerically distinct properties with the same essences, and thus Bird's argument from the last paragraph has no force here. It has to be noted though that according to RDM it is possible to have two distinct properties possessing the same dispositional powers; however these properties will have different essences, for their roles in the entire relational structure will be different. For instance, it may turn out that one of these properties serves as a manifestation in its downstream sequence of properties, whereas the other one does not. Whether concrete examples of such situations can be given, is an open question.

But we have to be aware of some other unexpected consequences of accepting RDM rather than SDM. Below I will argue that grounding the identity of properties in the overall structure of the manifestation and stimulus relation can actually lend support not only to dispositional monism, but to the mixed view as well. As we have seen earlier, MV is not threatened by the regress/circularity objection, for it can assume that dispositional properties are ultimately grounded in categorical properties which do not need any further reference to other properties in order to fix their identity. However, MV is open to a different objection. As Bird points out, any view which assumes the existence of categorical properties with no dispositional essences commits itself to *quidditism*: the acceptance of primitive identity between fundamental properties across possible worlds (Black 2000). For example, if we assumed that mass is a categorical property with no essential dispositional character, then we had to accept that in some possible world massive objects will not possess the disposition to accelerate when acted upon by a force. But then the question is: what makes the mass in this particular possible world identical with our mass? The only answer is that this must a brute fact, not reducible to any contingent features of the mass property. Bird claims that there are two consequences of this thesis. Firstly, one and the same property can posses a given power in one world but lack it in another. The second consequence of quidditism is that there can be two numerically distinct universals which nevertheless possess exactly the same powers in two different worlds. We have already encountered these claims when discussing the difference between strong and weak dispositional monism. As we can recall, weak dispositional monism denies the first consequence of quidditism, while SDM implies the negation of the second one.

Quidditism is a position which is hard to accept. We have already seen that it leads to the consequence that in our world there may be two numerically distinct but indistinguishable properties having the same causal powers. Another controversial consequence of quidditism is the possibility of the existence of two qualitatively indiscernible worlds in which properties swap their causal roles. But note that the mixed view does not have to commit us to quidditism. If we agree that all categorical properties participate in the manifestation/stimulus structure as manifestations or stimuli of other properties, then there is no reason why we couldn't assume that their identity too is determined by their positions in the structure. Graphs that contain vertices such that no arc is incident from them can also be asymmetric, as the example given below (Fig. 2) shows. Note that we do not claim, as is done in the standard version of MV, that the identities of all dispositional properties on the diagram are fixed by the identities of the categorical properties (the right-hand side vertices), for this would commit us to the view that it is a brute and irreducible fact that the upper-left vertex is distinct from the lower-left vertex. Rather, we assume that the identities of all vertices are determined in the same way, by their unique positions in the graph.

I believe that this is an interesting and unexpected consequence of Bird's structuralist solution to the problem of how to fix the identities of dispositional properties. It turns out that the mixed view is not that different from relational dispositional monism when we adopt the structuralist perspective on identity. Categorical properties figure in the overall structure defined by the manifestation/ stimulus relations, and thus they may be loosely interpreted as having broad 'dispositional character'. But this character stems only from the fact that they help other properties retain their dispositional nature, and not that they themselves possess certain powers. Let us note, however, that categorical monism cannot be rescued in an analogous way, for it admits only trivial structures with no edges

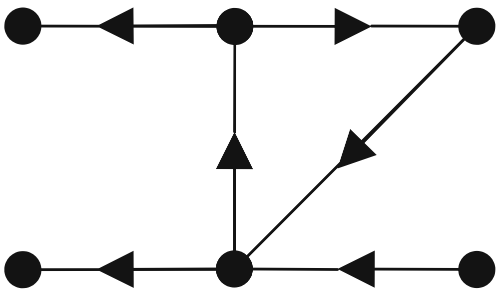

Fig. 2 Asymmetric graph containing dispositional and categorical properties

between vertices, and consequently all permutations of vertices count as automorphisms of such structures.[2]

At the end of the paper I would like to briefly consider an alternative solution to the problem of regress/circularity which preserves the original motivation underlying dispositional monism (dispositional essentialism) that the only factor deciding the identity of a property should be its immediate manifestation and stimulus. It turns out that in some cases the threat of circularity can be avoided even without redefining the essences of properties as their positions in the structure. An illuminating analysis of the problem of circularity in the context of Davidson's theory of events has been put forth by Leon Horsten (2009). He observes that Davidson's criterion of identity of events leads to circularity only in certain cases depending on the causal structure of the universe. The analysis of dispositions in terms of their manifestations and stimuli is exactly analogous to Davidson's account of events, for the latter identifies two events that have the same causes and effects, while the former assumes that two properties with the same manifestations and stimuli are numerically identical. Thus Horsten's analysis bears directly on the currently considered problem.

The approach adopted by Horsten can be generally presented as follows. Suppose that the vertices of graphs such as the ones depicted on Figs. 1 and 2 represent not properties themselves but their descriptions. Hence, it is possible that two different vertices actually denote one and the same entity. Now we may ask the following question: given that a particular graph satisfies the adopted criterion of identity for properties, is it possible to decide for every pair of descriptions whether they denote the same property or different properties? If the answer to this query is positive, we may conclude that the identities of all entities are determined by the adopted criterion, and thus there is no circularity.

Following Horsten, we may note that given that the graphs give us sound and complete knowledge about properties it is possible to show that all graphs satisfying the dispositional criterion of identity are non-circular, i.e. all questions about identity have uniquely determined answers. The completeness assumption states that if property P is related to property Q by the manifestation/stimulus relation, every description of P has to be connected with every description of Q by an edge. It is not difficult to see in concrete examples that indeed under the completeness assumption the identity of all entities in the graph will be determined. Consider, for instance, the following diagram (Fig. 3). It turns out that the two vertices on the right-hand side have to be identified, for they have the same manifestation property. However, the three vertices forming a triangle are definitely distinct for if they were actually descriptions of the same event, the assumption of completeness would be violated (the diagram would have to contain additional arrows pointing in the opposite directions to the ones depicted in Fig. 4). Thus, the initial graph 'collapses' into the one presented in Fig. 4, with three vertices forming a directional triangle. Interestingly, this example shows that a symmetric graph can nevertheless be non-

[2] Interestingly, from a structural point of view it is theoretically possible to accept a version of MV which admits a categorical property that is neither a stimulus nor a manifestation of any other property. But there can be only one such property, for if there were two, the entire structure would have a non-trivial automorphism which swaps these properties. Again, it is uncertain whether this theoretical possibility could have any concrete realisations.

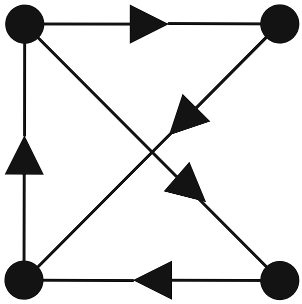

Fig. 3 Symmetric but non-circular graph

circular in Horsten's approach. This can be seen on the second diagram containing three vertices. Clearly, this graph admits non-trivial automorphisms, and yet it is determined that all three vertices denote numerically different entities. This fact may suggest that Bird and Horsten have slightly different notions of identification in mind. While Bird is primarily concerned with the issue of how to identify properties across possible worlds, Horsten presents the problem of circularity in terms of how to discern objects in the same, actual world. It seems clear that although in the actual world the three vertices are numerically distinct, there is no way of deciding which vertex corresponds to which when we compare two separate diagrams, each in its own possible world.

However, the completeness assumption may be considered too strong. Note that by accepting it we have to exclude certain graphs, perfectly acceptable by Bird's criteria, such as the graph on Fig. 1. The right-hand side vertices should be identified as the same property, and yet only one of them is connected with the upper-left vertex. Horsten suggests that it is more natural to assume semi-completeness rather than completeness of graphs: for all properties P and Q, if Q is a manifestation (stimulus) of P, then all descriptions of P are connected by an edge with *some* description of Q. The graph of Fig. 1 can now be seen as perfectly legitimate and satisfying the identity criteria. The right-hand side vertices are to be identified, because they are connected to the same manifestation, but the lack of an arc leading diagonally from the upper-left vertex to the lower-right vertex is not a problem anymore. However, although now satisfying the criteria of identity, the graph turns out to be circular in Horstein's sense.

Note that after identifying the upper right-hand side vertex with the lower right-hand side one, we are left with a triangular graph connecting the three vertices in a circular fashion, as depicted on Fig. 4. But now the question of whether these vertices denote three distinct entities or not does not have a determinate answer (as we are working under the assumption of semi-completeness and not completeness).

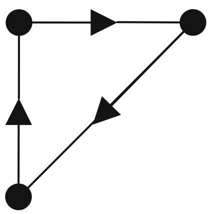

Fig. 4 Triangular graph connecting the three vertices in a circular fashion

In order to argue that vertex *a* is distinct from vertex *b* because the manifestation of *a* is *b* and the manifestation of *b* is *c*, we have to assume that $b \neq c$. But in order to argue for that, we have to show that $c \neq a$, and this in turn requires that $a \neq b$. The circle is closed now. We may insist that the three vertices denote numerically different entities, but equally well we can argue that they are three descriptions of one and the same property that happens to be its own manifestation. There is no way of deciding which answer is correct.

To sum up, it looks like the alternative method of dealing with the problem of circularity does not offer any clear advantages over Bird's structural approach. If one insists that properties with the same manifestations/stimuli should be treated as identical, one has to face the following choices: some cases which in Bird's approach are not circular have to be either excluded as not satisfying the identity criteria (when we assume completeness), or considered to be circular (under semi-completeness). Moreover, as Horsten himself points out, in the case of semi-completeness the proportion of non-circular graphs to circular ones decreases dramatically with the increase of the number of their elements. Hence it can be argued that in the majority of cases the problem of circularity will remain unsolved. On top of that, we have noticed that even cases that appear non-circular in Horsten's approach are suspicious in that they sometimes do not offer any way of identifying properties across possible worlds. In conclusion I suggest that the dispositional monist should bite the bullet and accept the structuralist approach with all its consequences, including the vindication of the mixed view as an alternative to dispositional monism.

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References

Bird, A. (2007a). *Nature's Metaphysics.* Oxford: Clarendon Press.
Bird, A. (2007b). The regress of pure powers? *The Philosophical Quarterly , 57* (229), 513–534.
Black, R. (2000). Against quidditism. *Australasian Journal of Philosophy , 78*, 87–104.
Dipert, R. (1997). The mathematical structure of the world. *Journal of Philosophy , 94*, 329–358.
Horsten, L. (2009). Impredicative identity criteria. *Philosophy and Phenomenological Research* , accepted for publication.
Leitgeb, H., & Ladyman, J. (2008). Criteria of identity and structuralist ontology. *Philosophia Mathematica, III* (16), 388–396.
Lowe, E. (2006). *The Four-Category Ontology: A Metaphysical Foundation for Natural Science.* Oxford: Oxford University Press.
Robinson, H. (1982). *Matter and Sense.* Cambridge: Cambridge University Press.