Corporate Action and Indexical Incoherence

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COMPOSSIBILITY HOW?

For Leibniz, two or more CIC (Complete Individual Concepts) are composssible if it is possible for them to be instantiated in the same possible world. The issue of how to determine if two CIC are compossible or incompossible is a debated topic. If the only predicates contained in a CIC are monadic ones and this means that they have the form Fx, then it becomes unclear how any two CIC could ever be inconsistent or incompossible.[1] Mates thinks that the solution to the compossibility problem is somehow connected with the doctrine of universal expression, what he calls the mirroring principle. He says,

> the "mirroring" principle clearly implies that concepts belonging to different possible worlds must be incompossible. It may be illustrated with Adam and Eve. Adam would not have been the same person if he had not been the husband of Eve, nor would Eve have been the same person if she had not been the wife of Adam; thus neither Adam nor Eve could have existed without the other. (76-7)

I agree with Mates that universal expression is essential to this problem, but Mates does not make clear exactly how CIC are incompossible. We know that concepts belonging to different worlds are incompossible. What we want to know is how we know whether or not they are incompossible without appeal to their being in

different possible worlds!

Monadic Perceptual Predicates

In order to try to solve the compossibility problem, I need to clarify the kinds of properties that are had by Leibnizian substances. The only true things that exist, the only true substances which correspond to CIC, for Leibniz are monads—mind-like entities that we conceive of on the basis of our own mental experience.[2] Dependent on the existence of monads are their modifications or properties, what Leibniz calls perceptions and appetites. Perceptions are to be understood broadly as any type of mental state, ranging from the cognitive to the sensory and affective.[3] Appetitions are tendencies or strivings of a substance that move mental life along from one perceptual state to another. The way appetites move from perception to perception is a manifestation of, and governed by, what Leibniz calls the individual law of the series. This individual law of the series constitutes the substancehood of a monad, and is sometimes referred to as the substantial form or the substance's primitive force (Adams 1994, 77-81).

So the modifications or properties of substances are not items like "being red" or "being six feet tall," but things like "perceiving that there is an apple on the table" or "thinking about birds." In general, we may schematize the form of monadic properties as follows:

> Substance s perceives p-wise that ϕ.

Perceiving p-wise that ϕ is the general form of a property of Leibnizian substances. Examples might include: substance s perceives sensation-wise that there is an apple on the table, or substance s perceives cognitive-wise that 1+1=2. I will refer to these as "monadic *perceptual* predicates" to avoid confusion with one-place predicates in general.

The Law of the General Order and Expression

The notion of expression is nicely summarized in a work from 1676:

> For it is sufficient to the expression of one thing in another, when there is a certain constant law of relations, by which each thing in the one can be assigned to each answering thing in the other. (Grua 15)

According to a version of Kulstad's formalism, the expression relation is analyzed as:

> x expresses y, in virtue of sets w and z, and according to relation R if and only if w and z are sets associated with x and y respectively, and R(x) is a function mapping w into z. (75)

Adopting Kulstad's formalism, the doctrine of universal expression is that every perceptual state of a substance expresses every other perceptual state of every other substance, in virtue of sets that consist of the perceptual contents of those respective states and according to a certain mapping described by the law of the general order γ.

The doctrine of universal expression is the key to solving the problem of compossibility. The question is: can we map truths about monadic perceptual predicates to truths of the form, "Substance s is part of a world with law of the general order γ," via expression?[4] I shall try to show that we can use universal expression to recover this content from perceptions.

The first thing to note is that this content should be recoverable. In *On Freedom*, Leibniz flatly asserts that the complete notions of substances "contain the whole series of things in which they will be contained" (AG 97). Thus there is a kind of mutual containment between substance and world. Each CIC contains information about the law of the general order of its world, and that law of the general order contains information about each law of the individual series of each substance existing in that world.[5]

Force and Perfection

In order to answer the metaphysical question of how CIC expresses the law of the general order, I need to take a detour through Leibniz's physics. It is commonly held that Leibniz was a relativist about motion; that he believed motion was not an absolute quantity, but could be assigned to any body one pleased. What Leibniz actually held was that *if* there were no forces acting in the world, then motion would be purely relative. Since there are forces acting in the world, these forces determine a unique reference frame by which to assign absolute values to the motion of bodies. Another way of putting this is that Leibniz believed a purely kinematic understanding of motion, in terms of the mere position of bodies, is relative, while a dynamic understanding of motion, in terms of forces or powers in bodies to move, is absolute. This position is stated in DM 18:

> For if we consider only what motion contains precisely and formally, that is, change of place, motion is not something entirely real, and when several bodies change position among themselves, it is not possible to determine, merely from a consideration of these changes, to which body we should attribute motion or rest…

> But the force or proximate cause of these changes is something more real, and there is sufficient basis to attribute it to one body more than to another. Also, it is only in this way that we can know to which body the motion belongs. (AG 51)[6]

There is a hiccup here. If motion, as measured by velocity, is relative, then surely force, as measured by mv^2, will be as well.[7] We need to figure out what is the "sufficient basis" that allows us to determine the true reference frame.[8] Luckily, Leibniz tells us how to do that.

In discussing the two rival hypotheses of planetary motion, the Copernican and the Ptolemaic, Leibniz says in *On Copernicanism and the Relativity of Motion* (1689):

> But since, in explaining the theory of the planets, the Copernican hypothesis wonderfully illuminates the soul, and beautifully displays the harmony of things at the same time as it shows the wisdom of the creator, and since other hypothesis are burdened with innumerable perplexities and confuse everything in astonishing ways, we must say that, just as the Ptolemaic account is the truest one in spherical astronomy, on the other hand the Copernican account is the truest theory, that is, the most intelligible theory and the only one capable of an explanation sufficient for a person of sound reason. (AG 92)

Here Leibniz says that one should use the Ptolemaic system when attempting to calculate the positions of objects in the sky relative to our position on earth, while one should use the Copernican system when one is attempting to give an account of actual planetary motion. The reason for using the Copernican rather than the Ptolemaic system is that the former is more intelligible and simpler than the latter; it is "the only one capable of an explanation sufficient for a person of sound reason." Previously, in the same work, Leibniz had declared that, "…one should choose the more intelligible hypothesis, and that the truth of a hypothesis is nothing but its intelligibility" (AG 91).

So out of the competing hypotheses for reference frames that distribute forces among bodies, and hence the absolute motions of those bodies, we ought to choose the simplest and most intelligible hypothesis, that is, we ought to choose the reference frame that distributes forces in the most intelligent and simple way.[9] There is one more important element to add to the story in order for us to understand how CIC express the law of the general order.

In DM 15, Leibniz is at pains to rescue our folk-causal talk from oblivion, given the causal isolation and independence of substances; in his own words he attempts to "reconcile the language of metaphysics with practice" (AG 48).[10]

Leibniz proposes the following:

> when a change takes place by which several substances are affected (in fact every change affects them all), I believe one may say that the substance which immediately passes to a greater degree of perfection or to a more perfect expression exercises its power and acts, and the substance which passes to a lesser degree shows its weakness and is acted upon. (AG 48)

Leibniz believes that we can retain our ordinary folk-causal talk. When we ordinarily say that one substance is the cause of an effect in another, metaphysically speaking, the substance designated as the cause is passing from a less perfect to a more perfect state, while the substance affected is passing from a more perfect to a less perfect state.[11]

EXPRESSING THE LAW OF THE GENERAL ORDER

Let us put these threads together. All monads will unconsciously perceive the motions of its universe from a particular reference frame. This configuration of motions from a particular reference frame will express the true configuration of motions associated with the real reference frame. The real reference frame will be the simplest hypothesis that accounts for the motions in the world, rendering them the most intelligible. The real reference frame will determine the correct distribution of phenomenal force, whose total quantity, mv^2, will be conserved across changes in motion. Not only will it determine the real motions of phenomenal bodies by determining the correct distribution of force, it will also determine a correct quasi-causal framework for phenomena. For example, if in the real reference frame, one body collides with another, changing the latter's motion in the process, we can say that the first body is the quasi-cause and the second body's motion the quasi-effect. Of course, no two monads ever truly causally interact. Therefore, what this quasi-causal structure reveals is that the monads in the first body, as quasi-causes, are, in their changing perceptions, moving to more perfect representations of the world, while those in the second, as quasi-effects, are moving to less perfect representations. Thus given the correct quasi-causal distribution among phenomenal bodies, we can also determine the distribution of changes in the degree of perfection of monads' perceptions. It is this expression of the way in which monads are changing their perceptions, from less to more and more to less perfect ones, that allows us to say that monads express the law of the general order.

We have:

1) Substance s perceives unconsciously the distribution of phenomenal motions δ
2) Distribution of phenomenal motions δ expresses the real distribution of phenomenal forces ρ according to simplicity mapping σ[12]
3) Real distribution of phenomenal forces ρ expresses distribution of perfection changes in monads π according to quasi-causal mapping χ

so,

4) Substance s expresses the distribution of perfection changes in monads π by perceiving unconsciously the distribution of phenomenal motions δ.[13]

A description of these perfection changes allows us to recover the law of the general order. Recall that the law of the general order contains information about every law of the individual series that exists at its world, that is, it contains information about all of the perceptual states that a monad at its world ever has had and ever will have. In addition to this, it also contains information about the harmony of that world, that is, about what perceptions express what other perceptions. A description of the distribution of perfection changes in substances' perceptions would contain information about those substances' perceptions themselves in much the same way that the equation for the differential of a curve contains information about the curve itself. Thus in the same way that one can recover information from the equation $y=2x$ about the equation $y=x^2$, one can retrieve information about the perceptions of other monads at a world from a description of their changing degrees of perfection. In this way, we have shown how one very important part of the law of the general order is expressed in a substance's perceptions.

We can now answer the question of compossibility. Two monads will be compossible iff their unconscious perception of the distribution of relative motion expresses the same distribution of perfection changes in substances. In this way, truths about compossibility and incompossibility will be grounded in the monadic perceptual predicates of CIC.[14] We can generate a unique space, each point of which is associated with a perfection value and evolves dynamically—a kind of world signature. Any other monad that expresses this same evolution belongs to one and the same world, that is, they express the same law of the general order.

ABBREVIATIONS

AG *Philosophical Essays*. Trans. and ed. by Roger Ariew and Daniel Garber. Indianapolis: Hackett, 1989.

Grua *Textes Inédits*. Ed. by Gaston Grua. Paris: Presses Universitaires de France, 1948.

NOTES

1. Formally speaking it becomes impossible to generate a contradiction between two different atomic propositions of the form Fx and not-Fy for two different x and y. The general point is that we appear to need relations in order to get incompossibility results. Thus if Rxy is contained in x and not-Rxy is contained in y for some x and y, then x and y are incompossible. It should be noted that Ishiguro holds that CIC contain predicates of the form Rxa. She considers these to be monadic predicates that ascribe relational properties to their corresponding subjects (99-100).
2. I bracket concerns here about the status of corporeal substances in Leibniz and the rich debate it has produced. In the following I assume a monadological picture where monads phenomenal expressions or correlates are corporeal substances.
3. It is not clear how the concept of a mental state, much less a perception, is applicable to the modifications of what Leibniz calls, bare monads. However, even these bare monads will be embodied, and the resulting phenomenal "protozoa" will be involved in a phenomenal world that they will need to minimally represent in some way in order to interact with. This falls directly out of Leibniz's pan-organicism—that there are animals "all the way down."
4. Much of the following comes out of numerous fruitful discussions with Gregory Brown, to whom I owe much thanks. Any missteps are my own.
5. Besides the passage quoted above from *On Freedom* about the containment of the law of the general order in CIC, there is the following from DM 16:

> And to the extent that every person or substance is like a small world expressing the large world, we can say equally that the extraordinary action of God on this substance does not fail to be miraculous, despite the fact that it is included in the general order of the universe insofar as it is *expressed* by the essence of the individual notion of this substance. (AG 49, my emphasis)

6. DM refers to "Discourse on Metaphysics." All quotes are from AG.
7. Roberts takes this to be a real problem and claims that force cannot be empirically determined (see 562-63, 567-68). I also note here that Leibniz's measure of force is not our Newtonian F=ma but rather what we would call kinetic energy.
8. The solution to this problem that I endorse here was first brought to my attention by Puryear. For a much better treatment of the complex terrain here, see Roberts and Puryear. For a much better defense of this solution, see Puryear.
9. Again, this solution was first put forward by Puryear.
10. I say folk-causal talk, but I want to emphasize that Leibniz's "reconciliation" is

meant to apply to ordinary causal talk as well as whatever causal relata enter into current physical theory.

11. We have not discussed a metric whereby one substance can be said to express the universe better than another. One *prima facia* possibility is that one substance expresses the universe better than another insofar as more correct inferences can be made about the universe from the contents of its perceptions and the expressive mapping between the two than can be in the case of the other.

12. The formalism for the expression relation that I use here is, again, due to Kulstad.

13. Of course, this argument assumes that Leibnizian expression is transitive, but given the above formalism for expression I see no reason why it is not. Thus the unconscious perception of the distribution of phenomenal motions δ expresses the distribution of perfection changes in monads π according to mapping $\chi(\sigma)$.

14. Of course, for this solution to compossibility to be viable, I must take these results to be modally robust. That is, for it to be a general solution to the compossibility problem, it has to be the case that simplicity and intelligibility determine the correct distribution of force in *all possible* worlds. One might think this move suspect, as part of why the actual world is the best possible is that its laws are the simplest and most intelligible. However, I see no reason not to think that the laws of a world are the simplest *relative to that world* and that the laws of the actual world are the simplest of the simplest (given the maximization of phenomena). According to the present account, Leibniz's optimism may know no bounds!

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