Soluciones al Reto Ontológico del Estructuralismo

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<u>El reto ontológico del estructuralismo:</u>

Si los lugares en las estructuras fueran objetos, violarían el principio de identidad de los indiscernibles.

Posibles Soluciones

Soluciones semánticas (también conocidas como "Aufweisung" i.e. "deícticas"): Frege, Russell, Wittgenstein, Benacerraf, Keränen, MacBride, Panza, Priest, Boccardi, Rothschild, Chakravartti, Psillos, Taisbak, Cameron (2012) Barceló, etc.

Podemos distinguirlas desde fuera de la estructura a través de, o bien, (i) algo externo al lugar, por ejemplo, (i.1) la diferencia entre los objetos que ocupan dichos lugares, (i.2) la manera en que los representamos o (i.3) simplemente adoptando una decisión convencional o (ii) apenado a algo intrínseco de los lugares, es decir, a algo que las distinga independientemente de las relaciones que tienen con otros lugares en la estructura (de tal manera que los lugares en una estructura serán algo más que los lugares en dicha estructura).

Pero (i.1) nos lleva a una dependencia ontológica de las estructuras a los sistemas de los que son estructura, lo que excluiría la posibilidad de estructuras no instanciadas y todo parece indicar que el estructuralismo necesita apelar a estructuras no instanciadas para dar cuenta de la complejidad de la realidad matemática.

Igualmente (i.2) sólo parece poder funcionar para estructuras suficientemente sencillas y no puede genralizarse a toda la matemática.

Por su lado, (i.3) haría que la identidad de los objetos matemáticos no fuera objetiva.

Mientras que (ii) debilita tabnto al estructuralismo que no puede distinguirse fácilmente del platonismo tradicional.

Además tiene otras consecuencias metafísicas no deseables que se siguen de la violación del principio de identidad de lo *extrínsicamente* indiscernible.

Ergo, dado que (i) y (ii) son incompatibles con el estructuralismo en matemáticas, las soluciones semánticas no están disponibles para el estructuralista en matemáticas.

Soluciones debilitadoras: Carnap, Saunders, Quine, Parsons, Ladyman, Shapiro, Ketland, Dewhurst, etc.

Adoptar una noción más débil de identidad para objetos en la que baste que dos objetos sean distinguibles *uno con respecto al otro* para ser *distinguibles* simpliciter. En otras palabras, basta que dos lugares sean distintos *según* una especificación de la estructura para que sean *distinguibles* en la estructura y, por lo tanto, distintos simpliciter.

Va en contra del principio de fundación de la identidad, i.e., que si la identidad de un objeto X depende de la de Y, Y debe tener identidad antes que X.

Pero la idea de que los lugares son objetos ya es contra-intuitiva, no es de sorprender por lo tanto que su identidad también sea contraintuitiva.

" If there should still be two locations for which we have found no difference even after exhausting all available scientific relations, then they are indistinguishable, not only for geography, but for science in general. They may be subjectively different: I could be in one of these locations, but not in the other. But this would not amount to an objective difference, since there would be in the other place a man just like myself who says, as I do: I am here and not there. (Carnap, 1928, §13)"

1. Apelar a un intérprete : Wittgenstein

This is the inverse problem of multiple realisability

Dewhurst ([2018] bites the bullet : they are different, but none of them is ROsencranz and neither is Gilderstern, instead they are both Rosencranza or Gilderstern (as a disjunctive property). Thus, even thgough there is no definite (structural) fact as to which place in the structure is 3 and which one is -3, there is still a structural fact that they are different.

Shapiro's textual sin: "There is thus a certain priority in the status of mathematical objects. The structure is prior to the mathematical objects it contains"

On Newman's problem:
" Consider the question of what one knows in virtue of knowing that a representation is accurate in the way described. Of course, one knows that the represented domain has a structure which is isomorphic to the structure of the representation. But this knowledge, it turns out, is trivial as long as the cardinality of the representation and the represented are the same." (Rotshild)

Chakravatii: "A knowledge of merely abstract structure, assuming it can be defended against the Newman objection, gives too weak a purchase on reality to constitute much of a realism."
Chakravartty 2010
Psillos (1999) argues that " the Newman problem … undermine[s] all forms of structural realism, in so far as it shows that some or another kind of "non-structural information" (about which properties and relations are "natural" or the like) must therefore be added …" (Friedman 2011)

"…two objects are 'weakly discernible' just in case there is two-place irreflexive relation that they satisfy" (Ladyman 2007: 30-1)

"each interpretation comes with its own entities"

"There is also the strange case of the two roots of -1 (*Towards non-being*, 4.4). There is nothing to distinguish between these; but at some stage, some mathematician (or committee of mathematicians) must have decided that one of these was +i and the other was −i." (Priest "Creating Non-Existents" n. 13)

Talk of roles in systems of rules as objects seems to go against the principle of identity of indiscernibles. For example, how many goalies (as roles) are there in soccer, one or two? On the one hand, the rules require there to be two goalies playing at any time in a match, and so we might be tempted to say that they are two – one for each team; but the rules that apply to one apply also to the others and thus it makes better sense to talk about a single role played by different player in each team. The problem is avoided if we introduce an equivocation in the term "role" so that each criteria captures the identity conditions of so-called "roles" in each of these senses. This, I think, is how we could adopt Woodward (2017) proposal to games.