

## **This is not an indexical concept! A note on Robert Hanna's theory of natural kind concepts**

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**Abstract.** According to Robert Hanna, natural kind concepts have an indexical component, represented by 'THIS BODY', that refers to the totality of matter found in any given possible world, and an attributive component, made up of phenomenological identifying features. I will argue that there is no place for indexicals in Hanna's theory. Initially, demonstratives don't select worlds, as his theory requires. Moreover, even as we try to amend his theory, either giving a proper reference to demonstratives or postulating the indexical reference to worlds by other linguistic mechanisms, we still can't find a place for indexicals. The reason is that the satisfactoriness of general terms, needed to vindicate his approach of modalities as evaluated at a rationally shaped modal space, requires no indexical component.

**Keywords:** modality, indexical, two-dimensional semantics, natural kind concepts

**Resumo.** Segundo Robert Hanna, conceitos para tipos naturais têm um componente indexical, representado por 'ESTE CORPO', que se refere à totalidade de matéria encontrada num dado mundo possível, e um componente atributivo, feito de traços fenomenológicos identificadores. Neste artigo, argumentarei que não há lugar para indexicais na teoria de Hanna. Em primeiro lugar, pronomes demonstrativos não selecionam mundos, como sua teoria exige. Além disto, mesmo se tentarmos corrigir sua teoria, quer postulando uma referência adequada para demonstrativos, quer considerando a seleção indexical de mundos por outros mecanismos linguísticos, ainda não conseguimos encontrar um lugar adequado para indexicais. A razão é que a semântica satisfatória para termos gerais, necessária para sua abordagem do espaço modal racionalmente delineado, não requer indexicais.

**Palavras chave:** modalidade, indexical, semântica bi-dimensional, conceitos de tipos naturais

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**1. Introduction**

In his book *Kant, Science and Human Nature*,<sup>1</sup> Robert Hanna deals with a wide range of topics, from scientific realism to the nature of perceptual content, from free will to the philosophy of mathematics. He discusses each one of them with great subtlety, proposing a unified Kantian approach to all the subjects. In this paper, I will focus only on Hanna's theory of natural kind concepts, as it is presented in the chapter 4, "Why Gold is Necessarily a Yellow Metal". I won't consider whether it is a correct reading of Kant, I am interested only in the validity of the proposed theory, or, more precisely, in the way he sees the indexicality of natural kind concepts.

According to Hanna, empirical concepts have two sets of features, intrinsic features that constitute its "conceptual microstructure,"<sup>2</sup> and "synthetic characteristics" that "are added to the conceptual core by means of a non-discursive or non-intellectual synthesis."<sup>3</sup> Natural kind concepts are empirical concepts that have an extra feature, an "essentially indexical component."<sup>4</sup> The concept GOLD, for instance, has two distinct sets of components:

- a) referential component: THIS BODY
- b) attributive components: YELLOW + METAL + HEAVY/HIGH DENSITY + MALLEABLE/DUCTILE + RUST-RESISTANT.<sup>5</sup>

Descriptive features of natural kind terms constrain what is picked out by its indexical feature: <...> natural kinds are picked out *essentially* indexically, but not *purely* indexically; instead, they are picked out essentially indexically under the further constraint of a certain associated description.<sup>6</sup>

While it seems reasonable to postulate that indexicals are not enough to delineate the sort of things referred to by a general term – it couldn't be otherwise, demonstrative by itself can only designate a particular object – , the specific way Hanna has of unpacking this claim is objectionable. The referential component of

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<sup>1</sup> Hanna, 2006.

<sup>2</sup> Hereafter, I will use 'conceptual structure' instead of 'conceptual microstructure'.

<sup>3</sup> Hanna, 2006, 209.

<sup>4</sup> Hanna, 2006, 213.

<sup>5</sup> Hanna, 2006, 218.

<sup>6</sup> Hanna, 2006, 217.

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natural concepts selects a world, leaving the fixation of the reference to a particular kind, be it a count noun or a mass term, to its attributive components. Here is Hanna's account of the semantics of GOLD:

<...> the referential component of the concept GOLD — namely, THIS BODY — is an essentially indexical component shared by all natural kind concepts, which restricts them to the totality of matter found in any given possible world considered as the actual world; but in any such world, the extension of GOLD is all and only those bodies that possess the analyzable or decomposable phenomenological identifying features of GOLD, namely, YELLOW, METAL, HEAVY/HIGH DENSITY, MALLEABLE/DUCTILE, RUST-RESISTANT, and so on.<sup>7</sup>

My main claim is that there is no place for indexicals in Hanna's account of the reference of natural kind terms. Initially, demonstratives do not select worlds, as he seems to suggest. There are two ways to modify his account of natural kind terms in order to avoid this problem, either giving a proper reference to demonstratives or postulating the selection of worlds by other linguistic mechanisms. The first route will lead us to Hilary Putnam's approach, and the second is close to the first dimension of David Chalmers' version of two-dimensional semantics. No amendment of Hanna's theory makes room for indexicals.

## **2. Indexicals in Hanna's natural kind terms**

For Hanna, the whole burden of reference fixing rests on the descriptive component of natural kind terms, once the reference to a world is given indexically. While 'THIS BODY' is an indexical component "shared by all natural kind concepts, which restricts them to the totality of matter found in any given possible world," the reference to a specific kind is determined by its "phenomenological identifying features." The indexical selection of worlds is usually accepted in philosophy of language, following David Kaplan and David Lewis. However, their framework is quite distinct from Hanna's in some important respects. For them, the world is not

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<sup>7</sup> Hanna, 2006, 213-214.

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selected by a demonstrative, but by the word 'actual' and its cognates.<sup>8</sup> If we assume Kaplan's consumerist semantics,<sup>9</sup> we should expect that formal languages capture the meaning of indexicals in the represented language. Demonstratives and words such as 'actual' and 'actually' have very different uses. The latter select worlds, while demonstratives typically select objects in the speech situation.

Linguists make a distinction between "exophoric demonstratives", "that are used with reference to entities in the speech situation," and "endophoric demonstratives," covering all other uses: anaphoric, discourse deictic and recognitional uses. None of them designates worlds. Exophoric demonstratives are mainly used to "focus the hearer's attention on entities in the situation surrounding the interlocutors."<sup>10</sup> They correspond to the prototypical use of demonstratives.<sup>11</sup> The intended working of demonstratives as referring to a world is entirely atypical, if it exists at all. Although we may accept it as a piece of philosophical convention, it is a departure from one of Kaplan's motivations for his Logic of Demonstratives: the representation of the semantic apparatus of natural languages.<sup>12</sup>

As we take a closer look at the way demonstratives work, we see that Hanna's theory concerning the attributive component of demonstratives may also be challenged. In Hanna's proposal, the attributive component has the conceptual structure of a natural kind term. It is true that the selection of *demonstrata* in a speech situation requires principles of individuation. However, what counts as an object is not determined by the "conceptual structure" of a given kind, but by much simpler principles, that can be described as that of a "Spelke-object." Spelke-objects are

<sup>8</sup> Kaplan 1989a, 502n, 511n; Lewis, 1983, 18.

<sup>9</sup> Kaplan, 1989b, 602.

<sup>10</sup> "Exophoric demonstratives focus the hearer's attention on entities in the situation surrounding the interlocutors. They have three distinctive features: first, they involve the speaker (or some other person) as the deictic center; second, they indicate a deictic contrast on a distance scale (unless they belong to the small minority of demonstratives that are distance-neutral); and third, they are often accompanied by a pointing gesture." Diessel, 1999, 94.

<sup>11</sup> "First, the exophoric use is prior in language acquisition. Second, exophoric demonstratives are morphologically and distributionally unmarked. And third, the grammaticalization of demonstratives originates from the anaphoric, discourse deictic and recognitional uses; that is, exophoric demonstratives are never immediately reanalyzed as grammatical markers. All three arguments suggest that the exophoric use has a special status. It is the prototypical use from which all other uses derive.", Diessel, 1999, 110.

<sup>12</sup> Kaplan's "epistemological" motivations don't seem to be represented either in Hanna's theory, since it is essentially concerned with contrasting perspectives of an agent on a scene (see Kaplan, 1989a, 528-533), very much unlike the contrast of worlds. In this respect, the reference Hanna makes to John Perry's essential indexical thesis is misleading (Hanna, 2006, 214), since they are dealing with a very distinct sorts of phenomena.

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coherent, bounded and rigid entities, and correspond to what toddlers expect to find in their experience.<sup>13</sup> The constraints on Spelke-objects – cohesion, boundedness and rigidity – appear early in the ontogeny (around 4 months) and are not specific to any kind (or they belong to the kind ‘physical object’).<sup>14</sup> Interestingly, such features are also the signature mark of the objects in the “mid-level object-based attention”, representations that “fall between low-level sensory processing and high-level placement into kind categories.”<sup>15</sup> There is no reason to think that to establish the reference to an object as part of their common ground – what seems to be a reasonable description of the exophoric use of a demonstrative –, speakers need more theory-laden principles of individuation. Although a more theoretical selection of the object of attention may be the aim of a given conversation, this is not a demand of demonstratives *per se*. We are not forced to choose between unstructured demonstrative reference, unable to individuate objects in a scene, and the “precisification”<sup>16</sup> by the descriptive content of an empirical concept. There are more basic principles that can be exploited in the use of a demonstrative.

The indexicality of natural kind terms doesn't seem to be well represented in Hanna's proposal: demonstratives do not select worlds, and while they demand principles of individuation, such principles are not provided by the conceptual structure of kinds. Maybe this is not the best construal of natural kind terms.

### **3. Redescribing the indexicality of natural kind terms**

The idea that natural kind terms have an indexical component can be found, of course, in Putnam. In Putnam's approach, the indexical component fixes the reference of natural kind terms across different situations in which speakers may have similar conceptual structures for different kinds, as it is the case for water and twin-water, or distinct conceptual structures for the same kind – in other words, across situations in which conceptual structures are unable to pick out correctly the stuff

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<sup>13</sup> The name comes from the work of Elizabeth Spelke, who has shown, with others, the structure of objects toddlers expect to find in their experience; for a recent overview, see Carey, 2009, 67-116.

<sup>14</sup> See Xu, 1997.

<sup>15</sup> Carey, 2009, 72; see also Cherries *et al.*, 2009.

<sup>16</sup> Hanna, 2006, 218.

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referred to by a natural kind term. Something of this sort seems to be needed in Hanna's framework as well. Different members of a community may have different core components of a natural kind concept – say, some do not include RUST-RESISTANT in the conceptual structure of GOLD. In this case, something more may be required to fix the reference to the same natural kind across distinct competences. The stability of reference is what allows the addition of new components to the conceptual core of a given concept.

We have two options here: either (a) every speaker has a sufficient grasp of descriptive components of every natural kind term in her vocabulary, so that the expansion of the conceptual structure of each term will be guaranteed to refer to the same kind by a satisfactorial semantics or (b) the reference to the same kind across speakers with different competences will be assured indexically. The first branch of the alternative is not very realistic. It seems that, in many cases, speakers do not grasp features of a concept that unambiguously pick out what is in its extension. That doesn't preclude the expansion or the revision of the descriptive components of such concepts, but something is required to fix the reference across changes in the conceptual structure. It is precisely the sort of argument used to promote the direct reference framework. Hanna can respond to this challenge by assuming the second branch of the alternative. But another reading of the indexical component of natural kind concepts is required, for fixing a world won't select different sets of objects, or different bits of stuff in the same world.

In Putnam's theory, the natural kind WATER is “whatever bears a certain equivalence relation (the relation called “*same<sub>L</sub>*”) to the piece of liquid referred to as “this” *in the actual world*.”<sup>17</sup> There are two indexical components: ‘this’ designates a sample that is supposed to have a certain relation with other samples of the same material, and ‘actual’ selects a world in which is found the stuff of which the designated part is sample. The sameness relation is not determined by the object selected in the speech situation. However, what is missing is not provided by the conceptual structure grasped by the speaker. The perceived structure may change, without a corresponding modification in what is taken to be in the extension of the term. The extension from the object or the stuff demonstrated in the speech situation to everything the speaker takes to be designated by the natural kind term is

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<sup>17</sup> Putnam, 1975, 231.

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presupposed by the speaker, a presupposition that derives from the fact that it is treated as a sample.<sup>18</sup>

The indexical reference to the actual world is added to the indexical selection of a sample. This addition follows from the contrast between worlds – in Putnam’s story, Earth and Twin Earth. This is probably what Lewis had in mind in his indexical interpretation of ‘actual’.<sup>19</sup> It doesn’t eliminate the proper demonstrative component of natural kind terms, selecting samples across speech situations related by a certain sameness relation, but add another indexical component.<sup>20</sup>

Nevertheless, it would be a mistake to pretend that we can make our way back from Hanna to Putnam, because their approaches lead to different modal profiles of natural kind terms. The central point in the direct reference framework is the nondescriptive nature of natural kind terms, from which their rigidity should follow. The attributive component has no impact on modal judgments: in no world does a natural kind term refer to whatever satisfies certain general conditions in any given world. Notice that this is neutral concerning what, if anything, should count as the essence of a given kind. Whatever it is, it won’t be the property, or the cluster of properties whose apprehension will fix the reference to a given kind for a speaker or for a community.

#### **4. Is there a half of a two-dimensional semantics?**

There are however other ways to understand the indexicality of natural kind terms. Let us take another look at Hanna’s semantics for natural kind terms:

<...> the referential component of the concept GOLD—namely, THIS BODY—is an essentially indexical component shared by all natural kind concepts, which restricts them to the totality of matter found in any given possible world considered as the actual world;

<sup>18</sup> “According to [Kripke’s] account, the predicate is first associated by speakers with a kind—either ostensively or via a description. In the ostensive case speakers directly associate the predicate with a certain sample of individuals, which they presume to be instances of a single natural kind of a given type (e.g., a single substance or a single species).” Soames, 2002, 267.

<sup>19</sup> “The strongest evidence for the indexical analysis of actuality is that it explains why skepticism about our own actuality is absurd.”, Lewis, 1983, 19.

<sup>20</sup> “Now then, we have maintained that indexicality **extends beyond the obviously indexical words and morphemes** (e.g., the tense of verbs). Our theory can be summarized as saying that words like ‘water’ have an unnoticed indexical component: “water” is stuff that bears a certain similarity relation to the water *around here*.” Putnam, 1975, 131.

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but in any such world, the extension of GOLD is all and only those bodies that possess the analyzable or decomposable phenomenological identifying features of gold, namely, YELLOW, METAL, HEAVY/HIGH DENSITY, MALLEABLE/DUCTILE, RUST-RESISTANT, and so on.<sup>21</sup>

Consider the following modal semantics of the natural kind term GOLD:

- i. GOLD refers, in  $w$ , to whatever is YELLOW, METAL, HEAVY/HIGH DENSITY, MALLEABLE/DUCTILE, RUST-RESISTANT in the actual world;
- ii. GOLD refers, in  $w$ , to whatever is YELLOW, METAL, HEAVY/HIGH DENSITY, MALLEABLE/DUCTILE, RUST-RESISTANT in  $w$ .

Hanna chooses the second option, that is what it means to say that GOLD refers to whatever has such and such features in a given world “considered as actual.” His choice corresponds to the first dimension in a two-dimensional semantics. As Hanna notices, there is “a close logico-semantic similarity between Kant’s notion of analyticity and the neo-Kripkeans’ deep or a priori conceptual necessity according to the primary intension.”<sup>22</sup>

A first-intension necessary sentence can be known *a priori*, because it states a canonical description of a certain kind of stuff – in Hanna’s terminology, its conceptual structure –, what requires a distinction between an idealized apprehension of concepts and what we can realistically expect people to grasp.<sup>23</sup> The first dimension, so understood, is in accordance with one central aim of Hanna’s thesis: basic modal notions should be evaluated at the logical space as delineated by what any rational being can grasp, a space that is larger than the space of the laws of nature. This is precisely the idea of the first dimension in a two-dimensional framework:

... even if all worlds with different laws of nature are metaphysically impossible, it will still be tremendously useful to have a wider space of logically possible worlds (or world-like entities) with different laws of nature.<sup>24</sup>

Such understanding of the logical space allows us to consider “all sorts of rationally coherent possibilities involving different laws,”<sup>25</sup> which is a way to make

<sup>21</sup> Hanna, 2006, 213-214.

<sup>22</sup> Hanna, 2006, 194*n*.

<sup>23</sup> Hanna, 2006, 229; Chalmers, 2006, 99.

<sup>24</sup> Chalmers, 2002, 193.

<sup>25</sup> Chalmers, 2010, 185.

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room for the contingency of the laws of nature within a modal domain established by the logical space.<sup>26</sup> In this picture, the contingency of natural laws, that infects identities such as 'GOLD = H<sub>2</sub>O',<sup>27</sup> is contrasted with the necessity provided by the conceptual domain, in which gold is necessarily a yellow metal.

But Hanna's proposal is no more at home in the two-dimensional framework than it is in Putnam's. In the two-dimensional theory, or at least in Chalmers' version of it, the indexical component is needed to deal with indexical sentences, while non-indexical components are purely qualitative specifications of a scenario:

One can think of D, intuitively, as a description of W in neutral qualitative terms, along with a specification in indexical terms of a center's location in W.<sup>28</sup>

In Chalmers' first dimension, indexicals are needed to deal with proper Kaplanian indexical claims, and not otherwise.<sup>29</sup> Sentences such as 'Gold is a yellow metal' are not indexical, and can be explained in purely qualitative terms.

For any possible world *w*, it is epistemically possible that *w* is actual, or at least it is epistemically possible that a world qualitatively identical to *w* is actual. <...> However, epistemic possibilities are more fine-grained than possible worlds. For example, the information that the actual world is qualitatively like a possible world *w* is epistemically consistent with different epistemic possible claims about one's self-location. For example, it is consistent with the claims 'It's now 2004' and 'It's now 2005.'<sup>30</sup>

This seems reasonable: there is no need for indexicals in the qualitative description of a scenario, that delineates the space of "rationally coherent possibilities." The result is that a concept such as GOLD has no indexical component in the first dimension of a two-dimensional theory. If Hanna's approach parallels the two-dimensional framework, it is no wonder that we could not find a proper place for indexicals in the analysis of natural kind concepts.

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<sup>26</sup> Hanna, 2006, 182.

<sup>27</sup> "In other words, the intrinsic non-relational dispositional properties of microphysical matter, on the scientific essentialist metaphysics, are necessarily and indeed even constitutively connected with the laws of nature that obtain in our actual world, or in any other possible world considered as actual. And this leads directly to a deep modal problem for essentialism: the contingency of the *actual set or package* of natural laws." Hanna, 2006, 182.

<sup>28</sup> Chalmers, 2006, 76.

<sup>29</sup> "The centered part <of centered possible worlds> is needed to handle indexical claims, such as 'I am in Australia'." Chalmers, 2006, 82.

<sup>30</sup> Chalmers, 2002, 551.

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We could say again that it's just another project. But this response seems less convincing now. In both cases, the idea seems to be the identification of the rational roots of our modal concepts in what can be grasped *a priori* by a rational subject, and in this sort of framework, there is no room for indexicals in the account of the modal profile of natural kind terms.

### 5. No room for indexicals

Let us recap the reasons for the uneasiness with indexicals in Hanna's proposal:

- They don't correspond to the prototypical use of demonstratives;
- They don't select samples, what seems to be needed to keep the reference across distinct competences with natural kind terms;
- They have no use in the purely qualitative space that seems to characterize the modal profile of general terms in a rationally delineated modal space.

In every case, Hanna can rightly answer that he simply has a different agenda. Fair enough. But I think that the difficulty to find a proper place for indexicals in Hanna's theory, as we compare it with other proposals, has its origin in a misuse of indexicals that can be identified independently, in a much less theory-laden way. For Hanna, the role of the indexical component in natural kind concepts is that a given kind has in its extension, in a given world, whatever has the characteristics that are part of its conceptual structure in this world – here is the indexical (notice however that it is a discourse deictic use).

Consider the attributive component of the concept GOLD according to Hanna:

GOLD: {YELLOW, METAL, HEAVY/HIGH DENSITY, MALLEABLE/DUCTILE, RUST-RESISTANT}.

Consider now the following situations:

$w^i$ : {YELLOW, METAL, HEAVY/HIGH DENSITY, MALLEABLE/DUCTILE, RUST-RESISTANT, *ATOMIC NUMBER 79*}

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$w^2$ : {YELLOW, METAL, HEAVY/HIGH DENSITY, MALLEABLE/DUCTILE, RUST-RESISTANT, ATOMIC NUMBER 80}, {WHITE, METAL, LIGHT/LOW DENSITY, MALLEABLE/DUCTILE, RUST-RESISTANT, ATOMIC NUMBER 79}

According to Hanna's approach, in  $w^1$ , GOLD refers to the element whose atomic number is 79, while in  $w^2$ , it refers to the element number 80. GOLD refers in each world  $w$  to whatever has its phenomenological identifying features in  $w$ . Since being a yellow metal is part of its phenomenological identifying features in every world, in every world it will be true of GOLD that it is a yellow metal. But this satisfactoriness of general terms requires no indexical. The set of yellow objects in  $w$  is the set of objects that have the phenomenological identifying feature of being yellow in  $w$ , and the sum of phenomenological identifying features will behave likewise, and no indexical is needed to describe this semantic behavior. In other words, it is idle to postulate indexicals in the structure of natural kind concepts, if they are to work the way Hanna proposes. That is the reason why, in the first dimension, indexicals are needed to deal with indexical claims, and not otherwise.

In a two-dimensional framework, the indexical reference to a world is needed to contrast two sorts of propositional contents, one of which is determined in relational terms, and that is the way 'actual' works in (i): GOLD refers, in a world  $w$ , to whatever is YELLOW, METAL, HEAVY/HIGH DENSITY, MALLEABLE/DUCTILE, RUST-RESISTANT in the actual world.

At this juncture, we need to say that there are different ways to deploy the two-dimensional framework, and they have different views concerning the delineation of the modal space. In particular, not all of them accept the basic modal space as being graspable *a priori*, as Chalmers, along with others, does.<sup>31</sup> Chalmers' version of two-dimensional models is just the one closer to Hanna's theory. The crucial point is that, according to Hanna's theory, in no situation does a natural kind concept refer to what lacks its phenomenological identifying features in this situation, and therefore there is no point in contrasting (i) and (ii) – we are always in the case (ii), and only in (i) there is an indexical element. In Chalmers, no matter how internalist his take on

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<sup>31</sup> For an assessment of Chalmers' internalist take on the framework, as opposed to his own externalist view, see Stalnaker, 2006.

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the first dimension is, there is room for second-dimension contents, that are not determined satisfactorily.

Demonstratives have no work to do in Hanna's theory, and that is why they are so atypical: they don't correspond to the prototypical use of demonstratives, they don't select objects in a scene, and there is no contrast between different sorts of content. I am aware that this is an extremely restricted view of a very rich framework, whose deep motivations I haven't even touched. Hanna is particularly interesting in showing the huge amount of metaphysics that comes with at least certain views of the direct semantics for natural kind terms, and that it should not be taken for granted, to put it mildly. However, it still doesn't buy a proper place for indexicals in his theory.

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