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Constitutive and Contingent Kinds: Relations between kind, form, and identity

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Abstract

We propose that kinds relate to particular things either constitutively or contingently. Taxonomic categories of animals and artifacts constitutively relate their members: DOG and CAR group things by aspects of the forms of their matter; the forms that make them things instead of stuff. Categories of things in roles or with diseases contingently relate to their members: LAWYER and DIABETIC group things by forms other than the forms that make them things. We confirm this distinction in five experiments with American adults.

Keywords: Concepts; kinds; identity; categorization

Categories play an important role in ordinary cognition and language. It is uncontroversial that categories like CHAIR, DOG, LAWYER, DIABETIC, and TRIANGLE abound in language and figure prominently in how articulate our knowledge of the world. The open question is how we represent categories and whether there is one or multiple ways. Perhaps the most significant debate about category representation is whether categories are mere names that make it easier to think and communicate about particular objects (nominalism) or whether categories correspond to kinds (realism). We can ask this with respect to the structure of the world itself as well as the stance our mind takes towards the world.

The debate between nominalism and realism often involves a commitment to realism in some domains but not others. One can, for example, affirm the reality of DOG while denying the reality of CHAIR. Considerable debate in psychology and philosophy turns on a distinction between categories in nature and categories in society. The debate proceeds from the assumption that categories of objects in nature (e.g. FERN) really are kinds, and/or that we mentally represent categories of objects in nature as kinds. The question, then, is whether categories of objects in society really are kinds (e.g., Appiah, 1995; Haslanger, 2012 on race; Putnam 1978; Schwartz, 1978 on artifacts), and/or whether we mentally represent categories of objects in society as kinds (e.g., see Malt & Sloman, 2007; Bloom, 2007).

We propose that theorizing about category realism is better understood with respect to whether a category is constitutively or contingently related to things in the category (Figure 1): A category is constitutive when it corresponds to part of what makes a thing a thing, whereas a category is contingent when it is does not. Taxonomic categories of animals (e.g., DOG) and artifacts (e.g, CHAIR) are constitutive. They group things by the form of their matter—the form that makes their matter a thing instead of mere stuff. Our view is that a thing has one form with many layers: A person has the characteristic morphology of a human (23 chromosomes, lack of body hair) and an organism (e.g., DNA, homeostasis) and a physical object, and so on. Therefore, an object belongs to many constitutive categories, such as PHYSICAL OBJECT, ORGANISM, ANIMAL, and HUMAN, which pick out different aspects of its form. Categories that group people by medical conditions (e.g., DIABETIC) and social roles (e.g., LAWYER) are contingent. Whether the corresponding form is incorporated in the body (disease) or external to it (role), the person is no less intelligible as a thing without it and no more intelligible as a thing with it. We can easily represent a person without a disease or role. The form of the disease or role is not the form of the person. Therefore, although we might say DIABETES is constitutively related to disease instances and LAWYER qua type of role is constitutively related to role tokens, DIABETIC and LAWYER, as categories of people, are not constitutively related to their members.
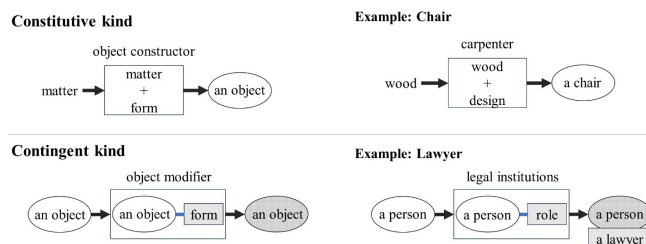

Figure 1. A schematic representation of constitutive and contingent categories.
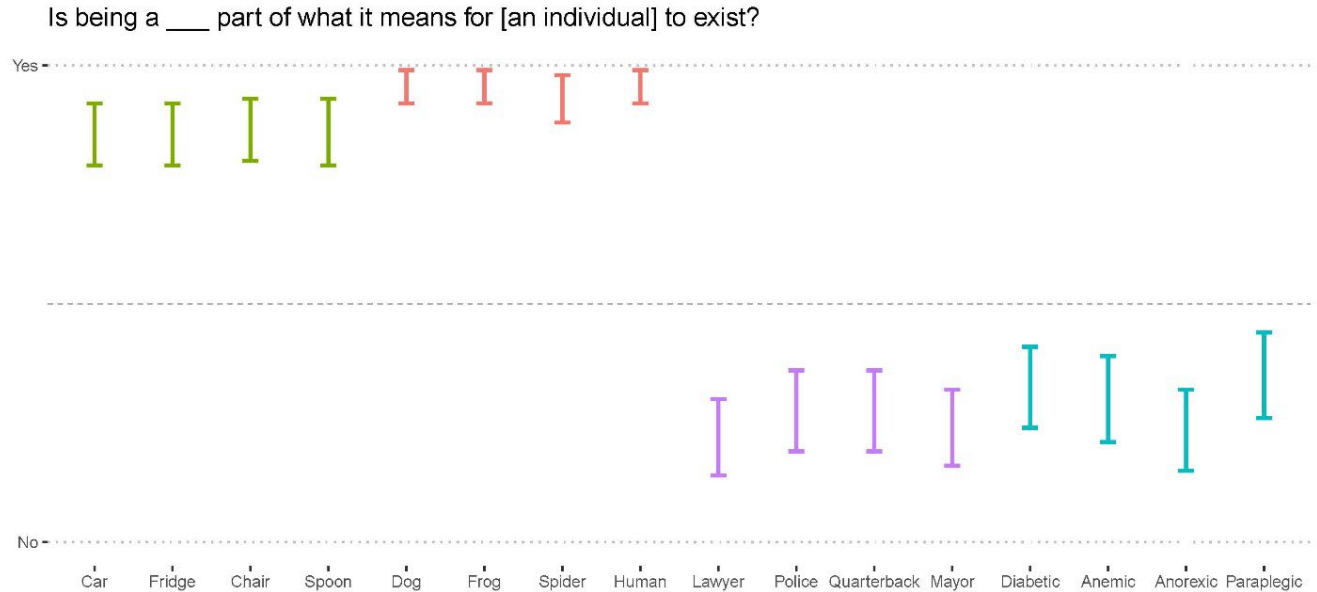
Figure 2. Results for Experiment 1. Color represents domain. From left to right: artifacts, biological taxa, social roles, and medical conditions. Error bars represent bootstrapped 95% confidence intervals [fun.data = "mean_cl_boot" in ggplot2 stat_summary in R]. Intervals include within-subject variance so overlap does not indicate the lack of a significant difference. However, intervals are informative relative to chance (dotted line).

Experiment 1

We examined taxonomic categories of animals and artifacts, which we hypothesize people take as part of what it means for a thing to exist, and categories of people with roles and diseases, which we hypothesize people do not take as part of what it means for a thing to exist.

Method

Participants One hundred participants were recruited on Prolific and took the survey online. We selected participants over 18 residing in the USA who spoke English as a first language. We did not collect demographic data.

Procedure. Participants judged whether 16 kinds were part of what it means for an individual to exist (Table 1).

Table 1 An example question from Experiment 1

Imagine a <u>refrigerator</u>. <u>It was made 5</u> years ago. It has the code <u>RT45</u>.

Is being a <u>refrigerator</u> part of what it means for <u>RT45</u> to exist?

(Think: Is the category essential like being intact?)

- ○ YES
- ○ NO

Note. Underlines indicate text that varied by question. Parenthetical was explained during study introduction and removed from subsequent studies.

Results

Items patterned as expected (Figure 2). Participants said all biological taxa and artifact kinds were part of what it means for an individual to exist, $ps < .001$, and said all social-role and medical-condition kinds were not part of what it means for an individual to exist, $ps < .01$. There was a significant difference between the kinds we presumed constitutive (artifact categories and biological taxa) and the kinds we presumed were contingent (social-role and medical-condition categories), $b = -4.28$, $SE = .20$, $p < .001$, $OR = 72.5$.

Experiment 2

All proposed contingent categories in Study 1 grouped people. Further, one might think contingent categories are less general than constitutive categories: "subordinate" in the language of category taxonomies. Study 2 contrasts categories that subsets dogs to remove these confounds.

Method

Participants One hundred and one participants were recruited on Prolific and took the survey online. We selected participants over 18 residing in the USA who spoke English as a first language. We did not collect demographic data.

Procedure. The procedure was the same as Experiment 1 except there were nine trials involving dogs.

Results

Participants said dog breeds but not social roles or medical conditions, were part of what it means for a particular dog to exist (Figure 3)—ps for comparison to chance < .001 for all items. Participants said yes more frequently when evaluating breeds than social roles, b = -4.38, SE = .33, p < .001, OR = 80.0, or medical conditions, b = -3.25, SE = .28, p < .001, OR = 27.7. There was a smaller but significant difference between social roles and medical conditions, b = 1.28, SE = .27, p < .001. These results support the proposed distinction between constitutive kinds and contingent kinds as distinct from category breadth.
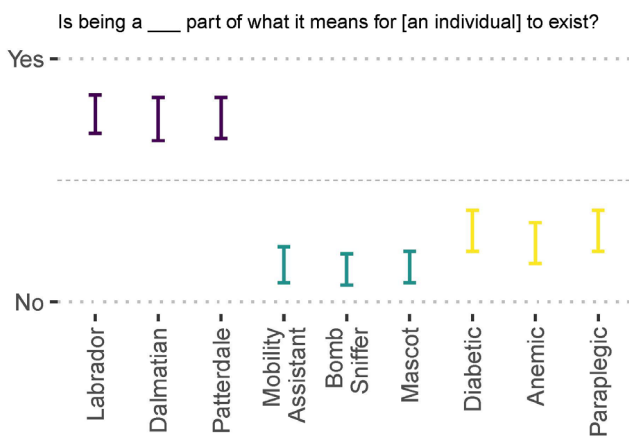

Figure 3. Results for Experiment 2. Color represents domain. From left to right: breed, social roles, and medical conditions.

Experiment 3

If artifact categories constitutively relate to things, words like "chair" cannot be mere labels for particular objects as some have proposed (e.g., Sloman & Malt, 2003). We hypothesize that people represent ordinary categories of artifacts as corresponding to their original design (Kelemen & Carey, 2007). Therefore, when labels correspond with design, participants should say the category is part of what it means for the object to exist—as they did in Study 1. However, when a label corresponds with an owner's classification and use, participants should not say the category is part of what it means for the object to exist. Such a result would simultaneously support our proposal that people represent artifact categories as constitutive in virtue of picking out parts of the form of their matter (which is latent in their original design) and dispute radically nominalist theories of artifacts.

Method

Participants. Ninety-seven participants were recruited on Prolific and took the survey online. We selected participants over 18 residing in the USA who spoke English as a first language. We did not collect demographic data.

Procedure. Participants read four vignettes: An object had the typical form of a chair, car, bathtub, or hammer but the owner labelled it as, and used it in a way typical of, a table, hotplate, hamper, or door stopper, respectively. For each object, participants judged whether the form category and the owner category were part of what it means for the object to exist.

Table 2. An example form-use question from Experiment 3

Your friend Sam invites you over. "Let me show you my table" Sam says. "Here is it!" [*Photograph of object with form typical of chair*]
• The manufacturer produced the object using a design for a chair. The parts and how they are configured is typical of chairs.
• Sam sits on the floor and uses the surface perpendicular to the floor to hold plates of food. Its current use is typical of tables.
Consider the sense in which 578G is a chair—its form. Is being a chair in this sense part of what it means for 578G to exist?
○   Yes
○   No
Consider the sense in which 578G is a table—its use. Is being a table in this sense part of what it means for 578G to exist?
○   Yes
○   No

Note. Underlines indicate text that varied by question.

Results

Participants indicated that artifact categories were part of what it means for an object to exist when labelling form but not owner use (Figure 4—top of next page). Form patterned like biological taxa; owner name and use patterned like social roles. The important thing to note is the similarity between how participants responded to artifacts in Experiment 1 and how they responded to labels for artifact form here, which indicates that we ordinary represent artifact categories as kinds that group objects by form, and that other labelling practices reflect language use rather than category representation.
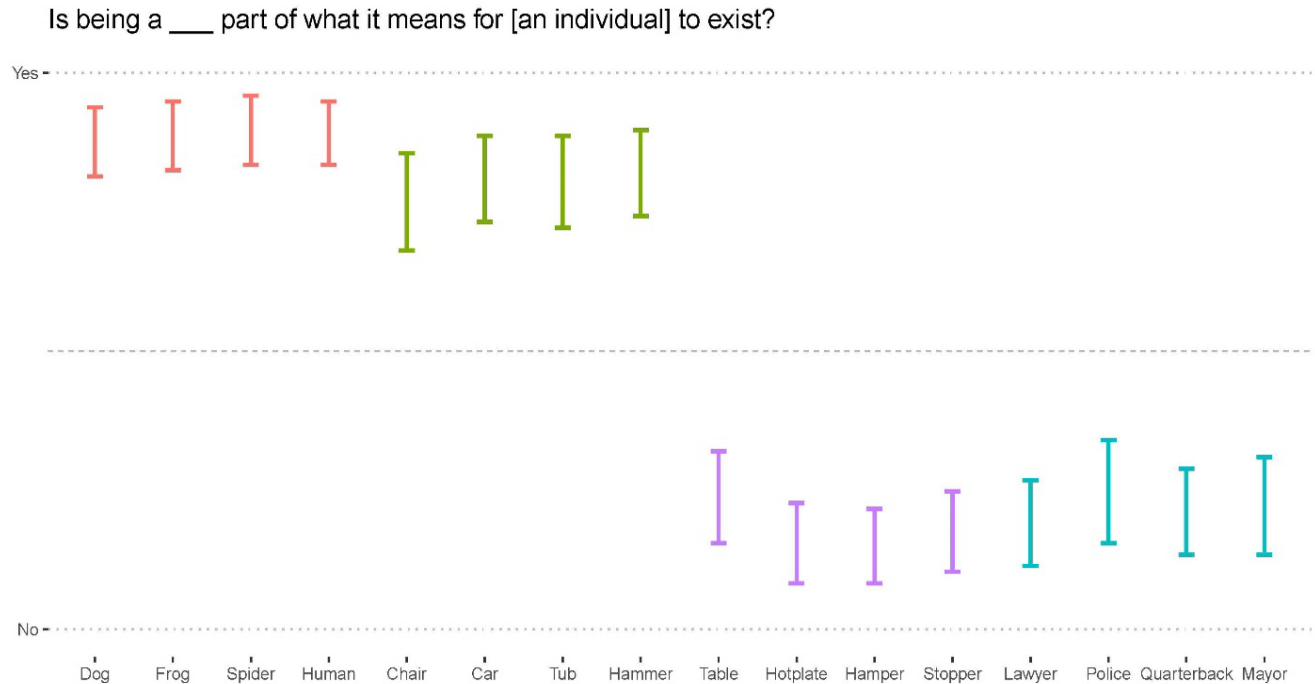
Is being a ___ part of what it means for [an individual] to exist?

Figure 4. Results for Experiment 3—previous page. Color represents domain. From left to right: biological taxa, artifact labels to mean form, artifact labels to mean use, and social roles. Each artifact had a form and use and are ordered by pair: Chair (form) / Table (use); Car (form) / Hotplate (use); Tub (form) / Hamper (use); Hammer (form) / Door stopper (use).

Experiment 4

On the proposed view, a form can fail to be constitutive of a person even while being internal and naturally determined—we can see this with the category DIABETIC. All genes play a role in giving form to matter. In the case of congenital diseases, we may observe the following pattern of reasoning: The more profoundly participants believe a condition impacts a person—"In general, how different is a person with this condition compared to a person without it?"—the more participants might believe say having the condition "is part of what means for [a person] to exist." This relationship should not occur for categories of people in roles. If we observe these domain differences, then we can conclude the proposed distinction between constitutive and contingent categories cannot be reduced to similarity or category boundaries.

Method

Participants Two hundred and three participants were recruited on Prolific and took the survey online. We selected participants over 18 residing in the USA who spoke English as a first language. We did not collect demographic data.

Procedure. Participants responded to two questions: Is the role/condition part of what it means for the individual to exist; how different is an individual with the role/condition, on average, from a person without it?

Results

There was a two-way interaction between difference ratings and domain (Figure 5—next page), $b = .04$, SE $= .01$, p $= .020$; the correlation was significant for both domains but twice as large for genetic conditions: (genetic) $b = .11$, SE $= .01$, p $< .001$; (role) $b = .05$, SE $= .01$, p $< .001$. Domain was still a significant effect in the interaction model: $b = .17$, SE $= .01$, p $< .001$, which can be seen in Figure 5 (top of next page): For the entire observed range of the X-axis, genetic conditions were rated as more a part of what it means for a person to exist than social roles.
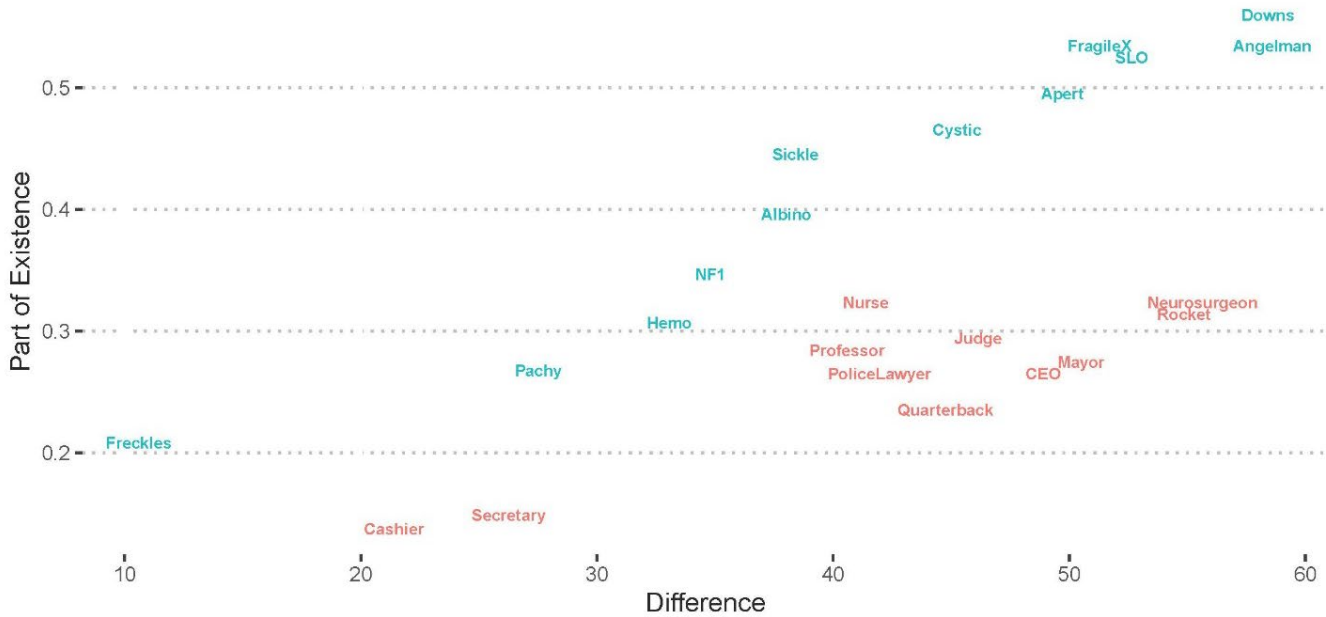
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Figure 5. Results for Experiment 4—previous page. In blue, congenital conditions. From left to right: freckles, pachyonychia congenita, hemochromatosis, neurofibromatosis type 1, oculocutaneous albinism, sickle cell anemia, cystic fibrosis, Apert syndrome, fragile X syndrome, Smith-Lemli-Opitz syndrome, Angelman syndrome, Down's syndrome. In red, occupations. Notice truncated axes. X values range 0 to 100. Y values range 0 to 1.

Experiment 5

We have empirically supported a difference between constitutive and contingent categories with respect to "synchronic" identity: Is the category part of what it means for a thing to be a thing? Next, we consider "diachronic" identity: Is the category part of what it means for the thing to be the same thing over time?

Method

Participants One-hundred and three participants were recruited on Prolific and took the survey online. We selected participants over 18 residing in the USA who spoke English as a first language. We did not collect demographic data.

Procedure. Participants read eight stories in which an object changed constitutive kind (table, kettle, shirt, hammer) or contingent (lawyer, biologist, police officer, quarterback). Participants indicated whether the two objects they were introduced to had the same code or different codes. We varied two features of the transformations: Whether the transformation described the past or the future, and whether the transformation involved an alternative kind or the absence of a kind. One Future-Alternative trial introduced a lawyer and described how she will become a doctor one day, and one Past-Absent trial introduced a table and described how in the past there was a pile of wood that became the table. In the case of social roles, Absent trials presented the person as a child or retiree.

Results

There was a significant and large effect of domain: p = 4.43, SE = .34, p < .001, OR = 83.8 (Figure 6). Participants endorsed persistence more often than predicted by chance alone for all changes involving role categories, ps < .001, and denied persistence more often than predicted by chance alone for all changes involving artifact categories, ps < .001.
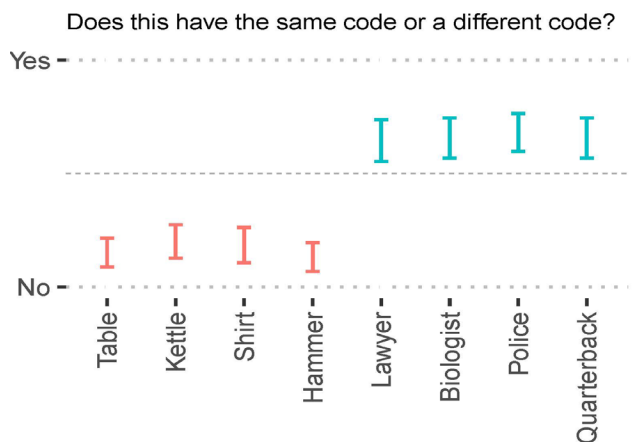

Figure 6. Results for Experiment 5. Color represents domain. Error bars are 95% confidence intervals. All conditions were within-subject. Participants responded to 4 vignettes per item.

Discussion

Five studies confirmed the proposed distinction between constitutive categories and contingent categories: Some categories correspond to part of what makes a thing a thing; other categories do not. Responses indicated that participants represent taxonomic categories of animals and artifacts (e.g., DOG and CHAIR) as constitutive and categories of things with roles and diseases (e.g., LAWYER and DIABETIC) as contingent. This distinction crosscut the distinction between categories in nature and society.

The distinction between constitutive and contingent categories is relevant to which categories we represent as real. Therefore, it is relevant to prior theorizing that relates to whether we represent categories as having an underlying reality, including prior theorizing about structural explanation, sortals, psychological essentialism, artifact categorization, and the formal structure of categories. The distinction between constitutive and contingent categories informs theorizing in all these areas. Depending on one's theoretical disposition, the distinction may offer a clearer delineation of which categories we represent as real—for example, we will argue psychological essentialism is better understood as a theory of constitutive categories rather than a theory of categories in nature. However, attempts to broaden category realism may encompass both constitutive and contingent categories with modification. Indeed, insofar as artifact categories have been central to debates about category realism, the vindication of artifact categories as real goes far in supporting a broadly realist account.

The orthogonality of the divide between nature and society and the proposed distinction works to dissolve either as a challenge to category realism. Those who argue categories in nature are real would want to include DIABETIC as real even though DIABETIC is contingent. Yet, being constitutive also seems sufficient: It is unclear how a constitutive category could be a mere label for an object (Sloman & Malt, 2003), because the category is bound up with why and how the object exists. Therefore, the proposed distinction favors a realist account of artifact categories (e.g., Kelemen & Carey, 2007). If neither being social nor contingent precludes category realism, then nothing precludes the reality of a category like LAWYER. Indeed, we may represent categories of people in roles as real in virtue of their relation to social institutions (Noyes, Dunham, Keil, & Ritchie, 2021); albeit social and contingent, social institutions normalize the properties of particular lawyers much like genomes, designs, and insulin dysfunction. Being clearer about the diversity of how categories relate to the things they group can reveal alternative sources of category realism.

A recent model distinguishes categories from the social structures that constrain them, which support "internalist" and "structural" explanations, respectively (Vasil et al., 2018; Vasil & Lombrozo, 2020). As stated, this account implies a category is constitutive but can enter into contingent relations. In contrast, we propose categories themselves can be contingent and that a contingent category can nonetheless support non-contingent generalizations: e.g., "Lawyers apply legal knowledge to solve specific problems." We also show that contingent categories can be internal and naturally occurring (DIABETIC). Therefore, although there are clearly explanations that reference social structures, the distinction between internalist and structural explanations may not adequately capture the most relevant ontological distinctions in how we represent and explain.

Psychological essentialism is the theory that we represent some categories as having essences (Gelman, 2003; Medin & Ortony 1989). We argue an essence is the form that confers numerical identity: Under this account, CHAIR has an essence but DIABETIC does not. In particular, we propose a thing has one essence—a "layered" form—and that its entire taxonomy (e.g., DOG, ORGANISM, PHYSICAL OBJECT) picks out aspects of its one essence. This provides a more orderly understanding of essences and a natural explanation for why essentialism holds for both kinds and individuals.

The sortal thesis (oversimplified) holds that an individual persists only when it preserves its basic-level category. (Carey and Xu, 1999, Macnamara, 1986, Xu and Carey, 1996; Xu, 2007). The causal continuity model holds that we identify an object as its closest causal continuation (Blok, Newman, & Rips, 2005; Leonard & Rips, 2015). We argue it is form that identifies an object. For example, in a prior study, participants saw three parts that could be configured in two ways; despite preserving causal continuity and sortal, participants identified each configuration as a numerically distinct table (Noyes, Keil, Dunham, & Ritchie, 2023).

According to one account, we represent kinds as having formal structures (Haward, Carey, & Prasada, 2021; Prasada, 2017; Prasada & Dillingham, 2006; 2009). The formal structure of DOG includes barking and four-leggedness. In present articulations, an object kind is constitutive: The formal structure combines with matter to create an instance-of-kind. Although we think this account can be made to accommodate contingent kinds; as stated, it is not clear how it can.

In our view, form is "structure/function." Structure and function are necessarily related (Kelemen & Carey, 2007). Structure *and* function vary in whether they are constitutive or contingent (Noyes, Keil, & Dunham, 2018): The structure and function of a hammer is constitutively related to matter, whereas the structure and function of money is contingently related to matter; this is why there is an ontological distinction between physical artifacts and social institutions.

In conclusion, the proposed distinction between constitutive and contingent categories clarifies existing debates and may be a more useful way of characterizing category representations than the traditional focus on nature and society.

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