

Postscript: Sortal concepts are fundamental for tracing identity

Mijke Rhemtulla & Fei Xu

University of British Columbia

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Our discussion with Rips, Blok, and Newman (2006; Rhemtulla & Xu, in press; Blok, Newman, & Rips, in press) has brought together theory and evidence from researchers in adult cognition and those in infant development. By this point, we all recognize that any theory of concepts of individuals must consider the evidence from infants' first concepts as well as explicit adult reasoning tasks. Despite this agreement, we continue to disagree on several fundamental issues.

Where Causal Continuity Fails. There is very little evidence that people have the relevant causal information necessary for them to rely on in tracing individual identity. Blok et al. (in press) do not think this is a problem, because people only need "practical information" about the sorts of changes that objects tend to undergo. But in falling back on this position, they are conceding their argument: where does this practical information come from, if is not associated with objects' *kinds*? A sortal account says precisely that sortal concepts group together individuals that experience the same sorts of changes throughout their existences, and it is that information that allows people to track individuals of a particular kind. If causal continuity, rather than sortal knowledge, allows people to track individuals through change, then people's causal knowledge *must* be deeper than generalities about kinds.

The Developmental Story. Blok et al. (in press) interpret the developmental evidence as suggesting that infants can use non-sortal concepts such as FURRINESS and SHININESS to support individuation (e.g., Wilcox & Baillargeon, 1998). But FURRY and SHINY are *not* individuating concepts, because objects can have both properties simultaneously. To succeed in the less complex object individuation tasks, these young infants may have applied a heuristic that a FURRY RED OBJECT is unlikely to be the same object as a SHINY GREEN OBJECT. Additional evidence that the OBJECT concept supports individuation comes from tasks where infants fail to track non-objects such as sand or collections of objects (Chiang & Wynn, 2000; Huntley-Fenner, Carey, & Solimando, 2002). Before they acquire basic-level sortals, infants are able to individuate objects based on spatiotemporal and property information coupled with the high-level concept OBJECT. Once they have basic-level sortals (acquired through language), they can then use kind information to support individuation (Xu, in press).

Regarding the role of language in the acquisition of basic-level sortals, Blok et al. dispute the claim that 9-month-old infants who hear two distinct words expect those words to refer to two different *kinds* of thing. Instead, they suggest, infants hear distinct labels and expect a "correlated contrast" in the hidden scene. This hypothesis seems very unlikely in light of the evidence. First, the contrastive labels

must indeed be labels, as opposed to tones, sounds, or emotional expressions (Xu, 2002). Second, the “correlated contrast” is very specific. Dewar & Xu (in press) have shown that 9-month-olds expect two distinct words to label two objects that differ in shape, not colour or texture; that is, two different *kinds* of object. Contrary to Blok et al.’s suggestion, it seems implausible to us that infants hold fine-tuned expectations about the correlations between words; the evidence supports the suggestion that infants expect words for objects to refer to distinct kinds.

We see two general lessons to be drawn from our exchange with Rips, Blok, and Newman. First, most people would agree that the world is causal *in general*. Clearly, adults impute causality in everything around them, and are likely to attribute the persistence of individuals to causal forces. However, we do not gain any explanatory purchase by lumping together a slew of factors that matter for tracing identity and noting that they are all, in some sense or other, causal. It is paramount for a theory to be able make predictions about human behaviour in a given scenario, and as far as we can tell, that predictive power is lacking in the causal continuer theory. Second, developmental evidence on individuation and identity must be integrated with evidence on adults’ conceptual representations. Together, the evidence for representations of sortal concepts early in development, coupled with the lack of evidence for the understanding of the relevant causal knowledge in infants and adults argue strongly for a sortal theory of tracing identity. After all, developmental origins *causally* determine adults’ conceptual structures.

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