woodward (2008) draft = causal perception and causal cognition

0. The findings on causal perception do not establish that infants have causal concepts: "we should not automatically assume that having a capacity to distinguish between causal and non-causal interactions in connection with launching events (or other similar phenomena) implies possession of a concept of cause like that possessed by adult humans or that collisions that look causal are automatically conceptualized as falling into a general category of causation" [Agree]

0.1 If infants' causal perception did involve causal concepts, and if these causal concepts were innate, this might lead to some tension with interventionist accounts of causation. But arguably they don't.

1. causal perception grounds intuitions supporting causal process theories: "various features of causal perception help to motivate or make plausible the intuitions that seem to support causal process theories (or more broadly, geometrical mechanical accounts of causation) , while contingency sensitive judgments play a similar role in motivating difference-making theories."

BUT (i) causal perception may not involve identifying the events perceived as causal (merely as having a distinctive phenomenology); (ii) as JW points out in %6.2, expectations about solidity and barriers may involve non-causal expectations about patterns rather than causal principles; and (iii) as JW points out, the notion of causation required for causal perception involves things like support relations, understanding which doesn't obvious involve thinking in terms of intersecting causal processes.

1.1 "in part it is psychological facts of this sort [i.e. the insensitivity of causal perception to contingencies] about the perception of causation that underlie some of the intuitions that causal process theorists have about the intrinsic, non-comparative character of causation."

BUT these psychological facts aren't introspectively obvious and needed to be discovered experimentally; so it's hard to see how they support intuitions.

2. the lack of a difference-making conception of causation would explain the dissociation between violation-of-expectations and action-based measures of causal understanding.

(Detailed example: "They do not suffer from “performance limitations” merely in the sense that, say, they know that (1) C causes E, recognize that (2) if C causes E, then (3) if it is possible to manipulate C, this is a way of manipulating E, but (4) face obstacles to their ability to manipulate C. Rather they act as though their alleged causal understanding does not incorporate the link between (2) and (3).")

BUT the actions involved do not seem to require a difference-making conception. The experiments Spelke mentions (Spelke 1994:441-2) and Berthier et. al.'s the 'Where's the

ball?' experiments involve reaching to retrieve an object AFTER an interaction. For example, the ball hits the barrier and stops, then children have to reach to retrieve it.

2.1 That interacting process is neither necessary nor sufficient for difference-making is one reason for thinking that whatever understanding is involved in causal perception is less than a full understanding of causation: "the natural conceptual development of the ideas that we associate with causal perception (continuity of trajectories, the role of spatial contact etc) seem to yield a way of thinking about causation that is conceptually distinct from the difference-making conception (as reflected in, e.g. casual process accounts of causation)" [Agreed]

3. the difference-making conception of causation is psychologically more fundamental because causal perception is based on contingency learning: "there is significant evidence (some of which is described below) for this second possibility—that capacities for causal perception develop over time through learning. Moreover, it seems plausible that this learning itself is based at least in part on covariational information—that is, that subjects learn that for one object to cause another to move via a collision, the two must be in spatial contact with each other, that one object supported by another, it must at least be true that the two objects are in spatial contact and so on."

BUT when you consider that causal perception involves sensitivity to very small differences in the duration of a delay (100ms or less), and to a range of interacting factors (like trajectories and relative speeds) plus context effects (like causal capture but also post-dictive), the learning would have to be extremely complicated.

4. V-of-E experiements show that infants have expectations but not that they have expectations concerning causal notions such as solidity and support: "the experiments just described are often interpreted as showing that infants possess knowledge of or are capable of reasoning with basic physical ideas concerning mechanical or contact causation, impenetrability and so on. The results reported in the experiments themselves, however, are obviously susceptible of a much more minimalist or deflationary interpretation since they simply have to do with looking time patterns and do not (at least in any obvious and straightforward way) tell us why those patterns occur. The fact that infants are not just sensitive to the difference between possible and impossible events but (often at least) look longer at the latter, does (in my opinion) make it natural to suppose that in the latter case they have expectations of some kind that have been violated. However it is a further and by no means obviously justifiable step to suppose that these expectations take the form of adult-like principles and concepts regarding object cohesion, impenetrability, causation by contact and so on."

PROBLEM: if infants' expectations are not organised around notions such as solidity and support, what sort of patterns DO inform their expectations? Perhaps a more fine-grained objection would be better: we can allow that solidity and support inform infants' expectations in some way or other without supposing that they have concepts of these things.

X. JW interprets Spelke's claims about core knowledge as implying that infants have causal concepts: "the "causal knowledge and reasoning interpretation does make much more specific claims about the nature of the infant's expectations that are revealed in looking time studies – it is claimed that these encode distinctively causal knowledge of principles governing the behavior and interaction of bodies, that in virtue of possessing these the infant is able reason about or make inferences regarding elementary features of physical causation, and it is this in turn that explains infant behavior in certain looking time tasks."

Spelke may have said things which suggest this but (i) it's not clear what 'concept' means and (ii) she allows that core knowledge is distinct from knowledge proper in several ways ...

First, the regularities in the behaviours of physical objects of which we have core knowledge are opaque. That is, we do not know which regularities we have core knowledge of (Spelke 2000: 1235). Second, in some cases these regularities contradict consciously held beliefs (ibid.). Third, core knowledge is specific to quite narrow categories of event and does not grow by means of generalization (Baillargeon 2002: 57, 2001: 344); it is best understood as a collection of rules rather than a coherent theory (Baillargeon 2002: 82). Fourth, core knowledge is "task specific" (Spelke 1994:441-2). These four features indicate that whatever representations are involved in core knowledge lack the features characteristic of concepts and that having core knowledge of regularities does not entail having conceptual knowledge of them.

On the other hand, core knowledge is suppose to provide "building blocks" for later understanding