

Working and Reflective Understandings of Sensory Modalities

“Often, one’s grasp of the significance of ... a judgement will be, in the first instance, a matter of how one reflectively expects the world to behave, and what counterfactuals one explicitly takes to be true. In such cases, one’s grasp of the judgement has to do with the detached picture one builds up of how things stand around one. But there are cases in which one’s grasp of the causal significance of a notion has to do not with any detached picture, but rather consists, in part, in one’s practical grasp of its implications for one’s own actions. These are the causally indexical terms” (Campbell 1993: 82).

1. Three-year-olds imperfectly understand how sensory modalities relate to knowledge

O’Neill and Chong found that “many 3-year-olds appeared entirely unaware of how their own sensory actions were related to the property knowledge they had gained only seconds earlier ... [C]hildren ... responded ... at times by demonstrating or naming an action that could not possibly have led to the knowledge in question” (O’Neill and Chong 2001: 812). Unlike 4-year-olds, they could not respond to an instruction to “[s]how me how you found out the bubble bath is strawberry bubble bath” (805) which only required them to repeat an action, and they could not respond to “[h]ow did you find out the bubblebath is strawberry bubble bath?” (805) either verbally or by demonstrating an action. Nor could 3-year-olds identify which sensory organ (mouth, eyes or hands) would be required to find out what the bubble bath is.

Is the problem that 3-year-olds do not remember how they experienced an object, whether they felt, saw or smelt it? This might seem plausible as subjects who understood the questions about their sources of knowledge could have answered them simply by recalling that they last smelt or felt an object. However, (Robinson and Whitcombe 2003: Experiment 2) demonstrate that children who fail these tasks can nevertheless remember whether they saw only part of an object or whether they saw a whole object. There is also some evidence that children observing two adults can recall which felt and which saw an object (Robinson and Whitcombe 2003: Experiment 1, video task). Accordingly, children’s deficient understanding of sensory modalities cannot be straightforwardly explained by a failure of memory and appears to be a genuine failure to fully understand how sensory modalities lead to knowledge (O’Neill and Chong 2001: 813–4; Robinson and Whitcombe 2003: 58, 60–1). Instead, it is plausible that children’s failure to correctly report how they know things arise from difficulties understanding how experience in different sensory modalities leads to knowledge. They do appear not to understand that feeling an object can tell you whether it is hard or soft but not whether it is red or blue.

2. Three-year-olds do understand how sensory modalities relate to knowledge

There are two main sources of evidence that younger children do understand how experience in sensory modalities leads to knowledge. First (Robinson and

Whitcombe 2003: Experiment 1) showed that children would accept an adult's testimony only when the adult but not the child had knowledge-yielding sensory access to the object. In their experiment children were allowed to either see or feel an object before being asked what they thought it was. An experimenter then either saw or felt the object and made a conflicting statement about what the object was. Finally, children were again asked what they thought the object was. Children changed their minds when only the experimenter should have been in a position to know given their sensory access to the object, but not when the child and the experimenter were both guessing. However, the authors suggest that the same children cannot say whether they know because they experienced the object or because they were told ("How did you know it was a strawberry/tomato—was it because you saw it or I told you?"), at least when this is not conflated with simply being able to recall what happened (Robinson and Whitcombe 2003: 58).

A second source of evidence for understanding comes from an experiment in which children were first given one mode of access to an object (seeing or feeling it) and then asked what it is at the same time as being given the opportunity to see or feel it (Robinson, Haigh and Pendle 2006 submitted). Here, even 3–4 year old children tended to see or feel the object only as necessary, demonstrating that they understood when further information was needed to answer the question and which sensory modality was required to obtain that information. Further support for this interpretation of the findings comes from the fact that children who had seen an object which could only be identified by touch would then choose to feel it rather than see more of it when given the choice (Robinson, Haigh and Pendle 2006 submitted: Experiment 3).

As well as revealing children's understanding of sensory modalities, these findings also indicate that children may have some appreciation that it's possible to have experience of an object without knowing everything about it.

3. Reflective–working contrast experiments

Some pairs of experimental conditions seem to provide a relatively direct contrast between working and reflective understanding.

Contrast using perception–knowledge links in solving a practical task with evaluating knowledge states. Robinson (2000: 67–8) reports a contrast between children's ability to use testimony in deciding what an object is with their ability to evaluate who knows what the object is. In the 'use testimony' condition (my term for it): subjects saw or felt an object then were asked what it is; an experimenter then felt or saw the object and said what the object is, always contradicting the child; children were then asked, "So which one is it?" In this condition, 3–4 year old children tended to say what the experimenter said only when the experimenter's mode of access to the object was informative. This suggests that children do understand that only some modes of access make it possible to identify an object. In the 'evaluate knowledge' condition (my term for it), the same procedure was used except that instead of being asked to identify the object they were asked "Who knows best which one it is, Helen (experimenter) or you?" 3–4 year old children typically failed this task. "Children behaved as if they knew which player was better informed when they decided whether

or not to believe what the experimenter said, but they failed to judge correctly who knew best when no utterances were given” (Robinson 2000: 68).

Two further experiments contrast a task where children are involved with a task where children are observers. First, in Robinson and Whitcombe (2003: Experiment 1)’s ‘video condition’, children observe one experimenter feeling a toy and saying what it is, followed by another experimenter seeing the same toy and contradicting the first experimenter. Children are then asked what the object is really. They also used a second condition which resembles the video condition except that the child plays the role of the first experimenter. Children found the second condition significantly easier than the first (Robinson and Whitcombe 2003: 55). Second, Robinson et al. (2006 submitted) examine whether children will spontaneously look at or feel an object before answering a question about its identity. In a ‘no access’ condition (Experiment 2) children has no prior experience of the object, and of interest was whether they would first look or feel the object depending on which form of access was necessary to identify it. They were very poor at this. However, in a ‘partial access’ condition (Experiment 3) children had already seen the object but were not able to identify it; here the question was whether they would choose to first look at more of it or feel it. Performance on this task was much better, perhaps because the children themselves were already involved with the object.

These contrast experiments may be useful in identifying what a distinction between working and reflective understandings of sensory modalities has to explain. To illustrate, take the idea that children’s working understanding of sensory modalities consists in implicit knowledge of rules which associate types of experience with types of knowledge (e.g. seeing is associated with knowledge of colour, feeling with knowledge of hardness). This may be correct but it can’t be a fully adequate account because it can’t explain the above contrast cases: all things being equal, someone who merely knew the associations ought to be equally good each task in the contrasting pairs of tasks.

4. What don’t 3–4 year old children understand about how sensory modalities lead to knowledge?

In short, the same children appear to both understand and not understand how sensory modalities lead to knowledge. This suggests that we may need a distinction between working and reflective understanding to explain the discrepancy in the experimental findings.

As a step towards invoking a working–reflective distinction we need some idea of what 3–4 year old children don’t understand. One extreme is that children have no understanding that sensory experience is necessary for knowledge. Another extreme view is that 3–4 year olds understand that experience explains knowledge and that different kinds of experience explain different kinds of knowledge, but have yet to learn which sensory modalities give rise to which types of knowledge. On this second extreme view, children have fully adequate concepts of knowledge and of sensory modalities; they simply haven’t yet learnt some rules relating these (e.g. the rule that direct knowledge of colour comes only from seeing).

The first extreme view can't be quite right because even 2½ year olds show some understanding of a situation in which visual perception is necessary for knowing (Dunham, Dunham and O'Keefe 2000: Experiment 2). Of course, this may be working understanding since this paradigm involves infants using an adult to obtain stickers: it may be true that 2½ year olds have no *reflective* understanding of how experience leads to knowledge. However, there is also anecdotal evidence that 3–4 year old children genuinely believe that they know things in virtue of their experience even though they are often wrong about which experiences actually resulted in this knowledge—Robinson (2000: 77) mentions a child who enthusiastically answers “How do you know it's the red one?” with “Cos I feeled it!” This suggests that 3–4 year olds may have some reflective understanding of how experience leads to knowledge.

I suggest that the second extreme view is also not a genuine possibility and that a child who thought that feeling can lead to knowledge of colour cannot have a fully adequate¹ concept of knowledge. Why not? Because part of what it is to be a state of knowledge is to be a state whose existence is (causally) explained by experiences. If we fail to think of knowledge as explained by experiences we fail to understand the connection between knowledge and the world and therefore fail to grasp on what means for knowledge to be knowledge of the world.² This is not to say that fully understanding knowledge requires thinking of it as explained by experience in general terms. Rather, the key to understanding knowledge is the ability to explain particular instances of knowledge by appeal to particular sensory experiences. This is relevant to understanding the child who sincerely asserts that she knows it's red “cos I feeled it”: while she might have an intuition that experience can somehow explain her knowledge, she has failed to grasp any genuine explanation (feeling doesn't really explain knowledge of colour). Accordingly, her statement suggests an incomplete understanding of knowledge as a state whose existence is explained by experience: it's not that she fails to know some of the facts about knowledge, but that she fails to fully understand what knowledge is.

Fully understanding knowledge and experience involves understanding them as interlocking components of a larger model of the mind. Just as knowledge has to be thought of as explained by experiences, so feelings and seeings are essentially things which explain knowing. So to fully understand what it is to see an object you have to be able to explain particular knowings in terms of particular seeings. The child who explains knowledge of colour by referring to feeling reveals inadequate conceptions of feeling and seeing.³

¹ ‘fully adequate’ is a fudge. What conception of knowledge should we to contrast the child's with? The adult conception or some philosophical conception which may or may not be fully understood by anyone?

² The claims in this paragraph need refining to accommodate knowledge by testimony. The view expressed here a relatively controversial claim about knowledge among philosophers (outside Warwick, at least). But for the purposes of our project I think it would be acceptable to cite a couple of philosophers who think of knowledge in this way rather than defending the claim ... unless ER or EN disagree about the nature of knowledge.

³ Here Naomi & Johannes have things to say about what sensory modalities are (e.g. that they're distinguished partly by their different enabling conditions) and what it is to understand them. More indirectly, there's also quite a bit of philosophy on individuating sensory modalities.

If this is right, there is no straightforward way to characterise what 3–4 year old children don't understand about how sensory modalities lead to knowledge. They neither entirely fail to understand how knowledge depends on experience nor fully understand what knowledge and experience are. Characterising their understanding would be a challenge even if there were no need to appeal to a working–reflective distinction to explain children's understanding of sensory modalities.

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		3 or 3–4 years	4 or 4– 5 years	5 years	source
1	[source] “How did you find out the bubblebath is strawberry bubble bathy” (805)	no	yes on lenient score		
2	[source] “Show me how you found out the bubble bath is strawberry bubble bath” (805)	no	yes		(O'Neill and Chong 2001)
3	“You show me what Mr Potato Head needs to use to find out what the toys are”	no	yes		
x cf. #4 ct. #y	children revise their judgements after testimony from a better-informed experimenter only when they are guessing (=the experimenter knows)	yes			(Robinson 2000)
y	Children see [or feel] and an experimenter feels [or sees], then children are asked “Who really knows?”	no	yes		(Robinson 2000)
4 ct #y	children revise their judgements after testimony from a better-informed experimenter, but not when both the child and experimenter are guessing	yes			(Robinson and Whitcombe 2003)
5 (ct #4)	Children correctly choose which of two adults’ testimonies to believe on the basis of their information access (seeing vs. feeling)? [video task]	no	yes		(Robinson and Whitcombe 2003: Experiment 1)
6	“How do you know it’s the red bug, because you saw/felt it or because I said so?” (conflates recall with source monitoring)	no	yes		(Robinson and Whitcombe 2003: Experiment 1)
7	[recall] “Did you see all of the strawberry/tomato or a bit of the strawberry/tomato?”	yes	yes		(Robinson and Whitcombe 2003: Experiment 2)
8	[source] “How did you know it was a strawberry/tomato—was it because you saw it or I told you?”	no	no		(Robinson and Whitcombe 2003: Experiment 1)
9	Feel/see an object already seen/felt only when necessary to identify it? [partial access]	yes			(Robinson, Haigh and Pendle 2006 submitted: Experiment 1)
10 ct #9	Decide whether to it’s necessary to see or feel an object before having any experience of it? [no access]	no	yes (harder than partial access)		(Robinson, Haigh and Pendle 2006 submitted: Experiment 2)
11 cf #8	“Did you know it was the hard one because you saw it or because you felt it?” [source]	no	yes		(Robinson, Haigh and Pendle 2006 submitted: Experiment 1)
12	Decide whether it’s necessary to feel an object rather than to see more of it?	yes			(Robinson, Haigh and Pendle 2006 submitted: Experiment 3)