

Activity 2: Naïve Physics

Peekaboo! If I close my eyes I can't see you and that means you're gone! Or does it?

Babies are not told how physics work. Even if we told them, they don't understand language yet, so they wouldn't learn anything anyway. The task is not easier once infants begin to speak (and understand speech) – it still takes years to teach them the basic principles of physics. But, even small babies seem to have some expectations about how things should and shouldn't behave in the world. If we drop something, it will fall to the ground. If we push something, it will move. Such expectations about the world are called naïve physics, and babies seem to be naïve physicists from a very early age.



Fig. 1: Babies seem to understand some laws of physics from a very early age!

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As children and adults, we understand that objects do not disappear into thin air, even if they are hidden from our view. You might not know where the object has gone, but it still exists in the world, somewhere out there. But when a baby drops a toy on the floor, or their parent goes out of the room, does he/she understand that these objects/people still exist? Knowing that objects do not stop existing once they move out of view is called **object permanence**.

The exact age at which babies start to show object permanence is disputed – some researchers say 8 months, whilst others say even 3-month-olds understand that objects continue to exist after they disappear from view. One way in which object permanence is assessed in infants is by showing them an impossible event. In this case, a toy-carrot was moved across the screen. A wooden block stood in front of the carrot's path, so the carrot would disappear from view, once it went behind the screen. However, the wooden block had a little 'window' cut out, so the carrot would briefly be visible when passing behind the block. The infants seemed to expect the carrot to appear in the little window, because they acted surprised when it didn't! They were not surprised that the carrot disappeared from view when it went behind the wooden block, they only acted surprised when the carrot did not appear in the little window. When a shorter carrot was used, the infants were not surprised that the carrot did not appear in the little window – after all, it wasn't tall enough to reach the window! This suggests that babies have a concept of object permanence from a very early age.

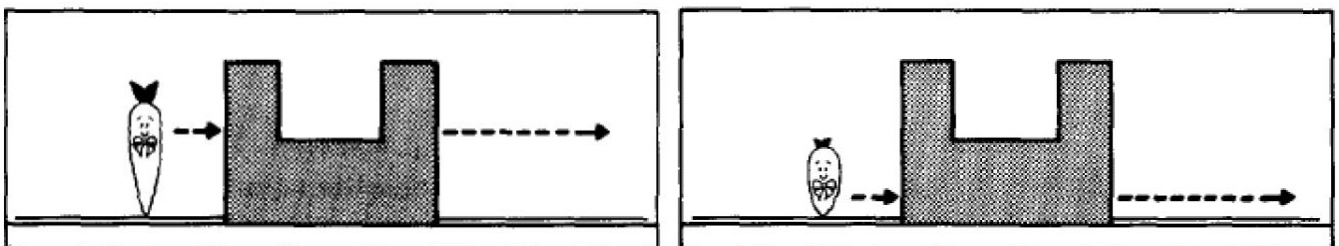


Fig. 2: The carrot moves behind a wooden block. Babies are surprised if the tall carrot is not visible through the little 'window', but they are not surprised that the shorter carrot cannot be seen through this 'window' – it's too short!

©Baillargeon, R., & DeVos, J. (1991). Object Permanence in Young Infants: Further Evidence. *Child Development*, 62(6), 1227-1246. doi:10.2307/1130803

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Infants also seem to understand a thing or two about how gravity works. For example, when 7-month-old babies watched a ball roll down the hill, they were not surprised. However, if the ball started going up the hill (defying the laws of gravity) babies were surprised and look at the event considerably longer.

Take a look at figure 3 – do you expect that the first box should fall to the ground? Well yes, of course, it has no support. What about the second box? It should also topple over the edge, as it's not supported enough from below. The third box should remain where it is. This was (hopefully) an easy task for you – you've interacted with plenty of objects before and you know exactly what to expect of them. It seems that 4-month-old babies can make these accurate predictions too! If something other than the expected event happened to the box, babies were confused and looked at the event for longer. Just like adults, babies were perplexed by objects floating in mid-air! At around one year, babies start to take the shape of an object into account when making predictions about whether or not an object will fall. For example, they'll be surprised to see an asymmetrical object remains stable, when only one side is supported.

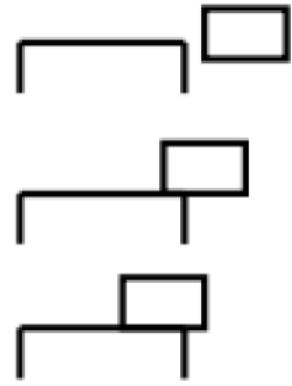


Fig. 3: should these boxes fall to the ground? 4-month-olds can make accurate predictions. ©Baillargeon, R., Needham, A., & DeVos, J. (1992). The development of young infants' intuitions about support. *Early development and parenting*, 1(2), 69-78.

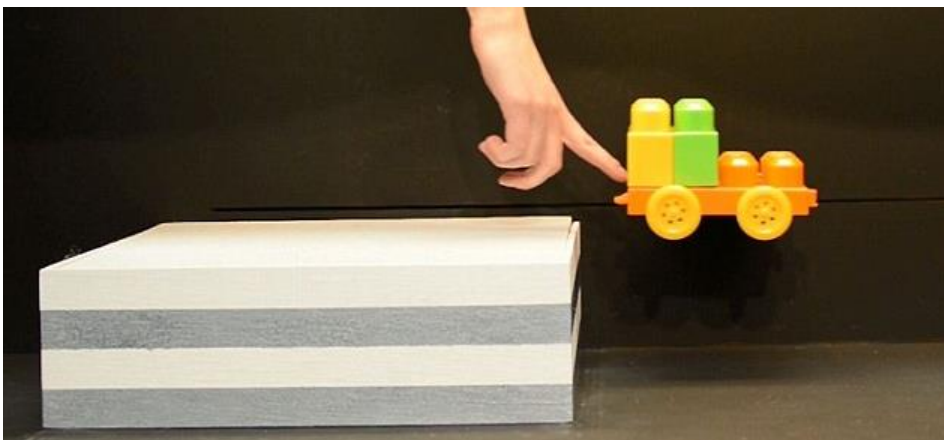


Fig. 4: Even very young babies seem to understand that this is an impossible event (and they show their surprise by looking longer at the event)

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Task

1. Watch this short clip: <https://www.youtube.com/watch?v=4jW668F7HdA>
The baby in the video is given two tasks – firstly, her mum shows her a toy and then hides it under a blanket. The baby lifts the blanket and finds the toy. How does this provide support for the idea that babies understand object permanence?
2. In the second part of the video, the toy is hidden under one of two blankets – the baby lifts the blanket on her right-hand side the first time, but then when the toy is hidden under the blanket on her left she still reaches for the one on her right. Do you think this shows that babies don't actually understand object permanence? Or is there another explanation as to why the baby looked for the toy under the wrong blanket?
3. Which method do you think is better when testing infants – looking at an infant's behaviour, or examining their looking behaviour?