

Infants Learn about Cause and Effect

As infants observe the world around them, they are already classifying, hypothesizing, and using tools to make sense of all the information they receive. With these skills, they form an understanding of physical and mental cause and effect relationships. The following is a collection of research findings that support this claim and explain how and what infants know about **cause and effect**.



What types of causal relationships can infants learn?

How objects behave – “Physical Causation”

Infants have an understanding of the properties of solid objects and how they behave.

Example: Infants know that solid objects do not go through one another. When they are shown a ball rolling behind a screen, where a tall wall is placed in the ball’s path, their eyes stop at where the tall wall is rather than looking to the end of the screen to see the ball roll out. Infants are able to anticipate that the wall will act as a barrier to stop the ball.

How things are related – “Contingencies Causation”

Infants can recognize sequential patterns, when two things are related or belong together, and how these two things are paired up to produce particular outcomes.

Example: Infants are able to pair sights and sounds. When infants are presented with pictures of a man and a woman placed side by side while listening to a track of a woman talking, they tend to look longer at the picture of the woman.

How individuals cause certain outcomes – “Effective Causation”

Infants realize that their own or others’ actions can change their surroundings and that they can intentionally perform certain behaviors to produce desired results.

Example: Infants are able to associate their own kicking with the movement of a mobile. If a ribbon is tied to a toy mobile on one end and tied to an infant’s ankle on the other end, infants may kick their “ribbon-ed” foot more often because they come to understand that they are causing the mobile to move.

How the mind affects behavior – “Psychological/Interpersonal Causation”

Infants refer to social signs given by other people to learn how they should behave and what causes people to act in certain ways in different situations.

Example: Infants base their own actions on their observations of other humans. Infants are more likely to mimic a human sticking out their tongue or opening their mouth than they are to “mimic” a box opening or closing in a similar way.

How We Know:

Scientists use many methods to better understand how infants learn, grow and develop! These are some of the methods scientists use to study infants and to understand their capabilities:

Habituation: Scientists find out if infants notice changes. They may show infants an object or action repeatedly until they look away and then replace it with a new object. If the infant notices a change, then s/he will look at the new object longer.



Head tracking and predictive reaching: Scientists look at how an infant moves his or her head to track the position of a moving object and how s/he tries to grab the object once it comes to a reachable distance. This action shows that infants are able to predict the location of moving objects and estimate the timing of when it will arrive.

Imitation: Scientists see if infants will imitate others. If an infant mimics certain behaviors performed by an adult, scientists know that the infant obtained and retained information from their interaction.

Eye Tracking: Scientists study where infants look. Infants are able to track different objects with their eyes. The longer an infant looks at something, the more likely it is that they are interested in that object.

Experiments you can try!

You can try all of the above experiments, but here are a few more you can try!

- If your infant likes the sound of jingle bells, put some small bells on a string and wrap the string around one of your infant's ankles. Does your infant tend to shake the leg with the bells around it? If so, your infant may have learned that there is a causal relationship between shaking their leg and the jingle bell sound!
- Can your infant tell when an action is performed intentionally or accidentally? Show your infant objects that he or she has never seen before, like a wind-up toy. Show your infant how the object works and gleefully say, "There!" With a different object, show your infant how it works and gently knock it over and say, "Whoops!" Does your infant play more with the first toy or second toy?

More information: Learn more about how scientists study children's development by visiting the Living Laboratory website: www.livinglab.org.

