

How Play Energizes Your Kid's Brain

Scientists have long studied play to gain insights into the developing human mind.

By **Cassandra Willyard**

July 21, 2020

Swiss psychologist Jean Piaget, one of the founding fathers of developmental psychology, spent hours each day observing his children as they grew. He recorded his observations in a raft of notebooks. Lore has it that his wife even carried a notebook on her necklace to jot down observations that Piaget himself missed.

One day, in 1925, his 7-month-old daughter, Jacqueline, was playing with a plastic duck in her crib. She tried to grasp it, but the duck slid down behind a fold in the sheet. Jacqueline saw the duck fall, “but as soon as the duck has disappeared — nothing more!” Piaget wrote. She seemed to forget the duck’s existence. Piaget picked up the duck and held it out and, just as Jacqueline was about to grasp it, he moved it “very obviously” under the sheet. But she still didn’t look for it.

This disappearing duck trick didn’t work forever. Piaget observed that babies do begin to hunt for and retrieve hidden toys starting at about 8 months. He saw this understanding that an object you can’t see still exists — what we now call “object permanence” — as a significant achievement (and perhaps why peek-a-boo loses its appeal).

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To the untrained eye, play can seem aimless, repetitive, wild or foolish. But play can offer a window into the developing mind. Piaget viewed certain kinds of play as milestones, signs that a child had reached a new stage of development. Studies conducted over the past few decades suggest play serves a more crucial role. Play can help kids learn, plan and even persevere in the face of adversity.

Do you believe in magic?

Babies start playing almost as soon as they become aware of their surroundings. They even conduct their own tiny science experiments to help them better understand the world. But some research suggests that they might not have to learn everything from scratch, that kids are born with surprisingly sophisticated expectations about how the world should work, like a basic grasp of gravity or math.

“That’s knowledge that has accrued through evolution,” said Lisa Feigenson, Ph.D., a professor of psychological and brain sciences at Johns Hopkins University and co-director of their child development lab. Decades of research have shown that if you present something to babies other than what they’re expecting, they get interested. “You want to figure out, why did I get this wrong?” she said.

Take gravity, for instance. Dr. Feigenson and Aimee Stahl, Ph.D., a psychologist at the College of New Jersey, showed 11-month-old infants toys that behaved in expected ways — a ball that rolled down a ramp and hit a wall — and toys seemingly imbued with a bit of magic, such as a ball that appeared to roll through a solid wall.

Babies paid more attention to the “magic” toys and even preferred them over other new toys. And when the researchers offered babies these magic toys, the infants seemed to understand how they were surprising, banging the wall-traversing ball against their high chair tray to test its solidity.

The researchers then gave these toys some unique feature. They showed babies that the ball squeaked, for example. Babies who observed the magic ball absorbed this information better than babies who saw a boring old ball that bumped against the wall. When the researchers presented the ball again along with a distracting new toy and played the squeak, the babies still tended to gaze at the ball. These same patterns held when Dr. Feigenson and Dr. Stahl did a modified version of the experiment with 3- to 6-year olds.

Let's just pretend

As babies become toddlers, their play gets more complex. Instead of simply making objects move through space, they begin to make believe. A banana might become a telephone and a pencil might take flight like an airplane. This penchant for pretend presents a conundrum: Why would kids, who are only just beginning to make sense of the real world, spend time making up new worlds?

One common idea is that, by pretending, children are practicing deciphering others' emotions and beliefs. But an alternate hypothesis is that pretend play helps kids develop a skill known as counterfactual reasoning.

Adults use this skill to consider events that haven't occurred and ponder what would happen if they had. For example, what would have happened if I had grabbed my wallet off the dresser before catching a cab to the airport? Mulling over past "what ifs" helps us better plan for the future.

"That's a very important, very distinctive human ability," said Alison Gopnik, Ph.D., a developmental psychologist at the University of California, Berkeley. That means separating actual events from possible events and pretend play helps children do that. What would happen if I could use this banana to call my grandma? What if this pencil could take flight?

To investigate this link between pretend play and counterfactual reasoning, Dr. Gopnik and her colleagues gave 3- and 4-year-olds a stuffed monkey, a "birthday machine" and some special blocks called "zandos." The researcher explained that it was Monkey's birthday, and told them that they could use the birthday machine to play "Happy Birthday." To activate the machine, they would have to locate a zando and place it on top. Non-zandos, she said, do not make the machine play "Happy Birthday." The children then placed the blocks on the birthday machine to determine which block would make the music play and which would not.

Once the children understood the cause-and-effect relationship, the researcher asked them a series of hypothetical questions. "What if this block were not a zando?" And then, "What if this block were a zando; what would happen if we put it on the machine?" About two-thirds of the kids answered correctly.

Then the fun really began. One of Dr. Gopnik's team members knocked on the door and repossessed the Happy Birthday machine. "Everyone's very crestfallen," Dr. Gopnik said. But then the researcher suggested another way to surprise Monkey. She offered up a plain

wooden box and asked kids to pretend it was the birthday machine. Then she suggested a different block as a pretend zando. “What will happen if we put this zando on the machine?” the researcher asked. “What if we pretend this isn’t a zando, then what will happen?”

Again, about two-thirds of the kids answered correctly, the same children who performed well in the first experiment. That is, the ones who could imagine hypotheticals that hadn’t occurred were also the best at pretending to operate an imaginary machine with an imaginary zando.

Dr. Gopnik and her colleagues have shown in other experiments that asking kids to pretend before presenting them with hypotheticals improves their performance. These studies suggest that pretend play is a steppingstone to the important adult skill of planning.

The Batman effect

Pretend play might also help kids regulate their emotions and persevere through difficult, tedious or frustrating tasks. In one experiment, researchers at the University of Minnesota put a toy inside a glass lockbox and handed 4- and 6-year-olds a ring of tiny keys. Open the box, they told the kids, and you’ll be able to play with the toy.

They asked a quarter of the children to pretend to be someone else while they completed the task — Batman or an intrepid adventurer like Dora the Explorer. They even offered them props to make them feel more like that character.

Stephanie Carlson, Ph.D., a developmental psychologist at the University of Minnesota who ran the experiment, and her colleagues hoped to get the kids to step outside themselves. They hypothesized that this kind of psychological distancing might help the children better manage their emotions during what turned out to be a frustrating task.

And the kids did get frustrated. In an odd twist, none of the keys actually worked (though the kids did get to play with the toy at the end). The children who pretended to be the hardworking fictional characters stayed calmer. They also spent more time trying to open the box and tried more keys.

This “Batman effect” — coined by Dr. Carlson and her colleagues — was most evident in younger kids and those with poor self-control and working memory. The Batman effect also helped kids persevere when faced with another, more boring, task. It’s a trick that might come in handy when you need your preschooler to help, say, pick up Legos.

For kids, of course, play isn’t about learning or planning or regulating emotions. It’s about having fun. Play may be “evolution’s way of building in an insurance policy” to learn and develop, said Dr. Feigenson. It’s so enjoyable that most kids can’t resist, and along the way

they develop the skills they need to succeed as adults.

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