

**Learn more from Dr. Sarah Gerson about the context and relevance of the findings which her team at Cardiff University uncovered during this new study, including:**

- Playing with dolls can help children rehearse social interactions and allow them to develop empathy and social skills, which are essential for their future success.
- Parents, we can be reassured that by playing alone with dolls, children practice the skills used when playing with playmates and in other future social interactions.
- The findings are the first to provide brain-level evidence supporting the idea that pretend play has social benefits when children are playing by themselves.
- Social benefits include: Being able to understand why a person is behaving in a certain way, anticipating their needs and using this information to plan our actions, becoming more cooperative and better collaborators. When working on a team, a better understanding of others and their emotions helps us to resolve conflicts. Learning about other people and what they know and think will help us recognize who to trust and ask questions when we need help with something or want to learn more. All of these skills together help children (and adults) improve and learn from relationships.

Social understanding and empathy are essential skills for building a better tomorrow, acting as crucial ingredients for children hoping to become caring citizens, leaders, teachers, and parents of the next generation.

# The Benefits of Doll Play According to Neuroscience

By Dr Sarah Gerson

As parents, we're constantly juggling a variety of tasks. The recent lockdown has brought renewed attention to the fact that parents' responsibilities can take up far more hours than exist within a given day. It's probably not difficult for you to imagine this scenario: You're sitting on your laptop at your dining room table, trying to catch up on emails while keeping an eye on your child and watching a timer for a meal you're preparing. You overhear your child playing on the floor next to you. "Are you okay?" asks one doll. "I miss my friends", says the other. You sigh in relief that your child is keeping busy but instead of getting back to work, you start browsing the internet to see if the overheard interaction is a sign that a lack of playmates is troubling her.

Parents are more overwhelmed than ever, juggling work, homeschooling, housework, and potential financial difficulties. A handful of questions repeatedly pop up about this balancing act on social media and in parenting groups: Am I giving my child the right toys to help them learn? Is it okay to let my child play by themselves? What's going on in my child's head when they're playing? Is my child missing out on crucial social development opportunities?

**Our Cardiff University child development research group recently found evidence that even when playing with dolls alone, children's brains are active in similar ways as when they interact with other people. Playing with dolls can help children rehearse social interactions and allow them to develop empathy and social skills which are important for future success in our social world. This, we hope, should bring some comfort to parents concerned about their children's social and academic development.**

In our research, we investigated what's happening in 4-8-year-old kids' brains when they play with dolls or tablets by themselves and with a playmate. Using a technology called fNIRS (which we introduce in more detail below), we looked at a part of the brain that's used when people think about and interact with others. We found that this brain area is similarly active when kids play with dolls by themselves and when they play with a playmate (either dolls or on a tablet). Below, we summar-

ize why this new finding is so exciting (hint: doll play can help kids develop into more successful adults).

Why is this good news for us as parents? When your child is playing with dolls, they can practice how they might interact with a friend even when playing alone. This play allows them to think about how their friend could be feeling (perhaps sad they can't see each other) and how they might react (comforting that friend). All parents are concerned about whether our children are prepared socially for the future and improving empathy is even more relevant in the current environment than ever. It will always be important for children to practice social skills and try out another person's perspective.

Before diving into the new research, we must first consider why doll play might help children gain social and emotional skills and highlight why looking at what's happening in kids' brains while they play is an especially useful tool.

### **What kinds of play help children learn?**

If parents were asked what toys they think help their children learn, they'd likely default to games and toys that involve predefined problems and solutions. Many think that STEM-focused toys are the most educational and toys that don't directly involve science or mathematics are "just for fun," lacking the same benefits. Some have begun to incorporate arts (turning STEM into STEAM) and creative play into their umbrella of activities that they see as beneficial. Doll play, on the other hand, is often viewed as not having an educational benefit. Our research challenges that perception, showing us that doll play is valuable in helping children learn.

When playing with dolls, children often play out scenes between characters that may seem simple on the surface but could present opportunities for the child to develop social and emotional skills. Dolls like Barbies offer a wide expanse of diverse characters and add-ons like professional roles and uniforms (a judge, a football player, or a doll in a wheelchair), that can help children identify with and imagine an infinite range of scenarios.

As parents, it seems obvious that playmates are important for building and learning about relationships and other people (sometimes called social understanding) and recognizing others' emotions (known as empathy). This is perhaps why so many parenting forums and news articles have discussed parents' fears about how social isolation might hinder children's development. But what if certain kinds of play could help children practice these skills? Previous research has found that children who pretend play more have better social understanding and empathy skills than children who don't engage in pretend play as much, which suggests that pretend play could be useful for improving these skills. How can we figure out what's happen-

ing in their heads when they're playing and whether this has benefits? One way to directly connect pretend play to children's thoughts is by examining brain function during play.

### **What can we learn from studying the brain?**

To date, we knew very little about brain activity during play because tools used to measure brain activity previously required the person being studied to sit completely still in an enclosed space. Luckily, a new technique called fNIRS (functional Near Infrared Spectroscopy) has been developed to look into brain activity while children move around freely. Using fNIRS, other labs have shown that a particular brain region (the pSTS; posterior superior temporal sulcus) is more active when toddlers look at a toy with another person than when they look at the toy by themselves. This same brain region has been shown to be important for social understanding and empathy across cultures and countries (spanning Africa, the Americas, Europe, Asia, and Australia), demonstrating the ubiquity of social brain processing across continents. This shows us that this brain region is universally important for social interactions. What this new research tells us is what happens when children play with toys in a natural way.

### **What did we do?**

We brought kids into our research center to play games like they would at home (free play without instruction) while having their brain activity measured using fNIRS. All children's play was divided into segments with different kinds of play. They got to play with dolls half the time and on a tablet the other half. Doll play sessions included a wide range of diverse Barbie dolls and accessories (e.g., a house, an ambulance, a horse, etc.). Children were introduced to two different games to play on the tablet. Within both doll and tablet play, the child sometimes played with a playmate (an experimenter) and sometimes played alone. Children wore an fNIRS cap (which fit like and resembled a swim cap) throughout the entire session so we could measure brain activity during each kind of play.

## What did we find?

- The study found that doll play activates a brain region (pSTS) associated with social information processing such as empathy, showing doll play enables children to rehearse, use and perform these skills even when playing on their own.<sup>1</sup>
- The study also showed that solo doll play allows children to develop empathy and social processing skills more so than solo tablet play. Activation of the social processing brain region (pSTS)<sup>2</sup> is greater during solo doll play vs. solo tablet play.
- The findings were consistent across boys and girls and children of different ages (between 4 and 8 years).

## What does this mean?

These new findings are important for a few different reasons, but what is most exciting is that we know that this social processing brain region (the pSTS) is active when children play with dolls by themselves in a way they would naturally play at home. This suggests that, without any prompting or instructions, children naturally play with dolls in a way that allows them to practice social interactions and improve their empathy and understanding of other people. **So, as parents, we can be reassured that playing alone with dolls lets children practice skills that they use when playing with playmates and in future social interactions.**

These findings build on ideas that were presented by pioneering developmental scientists nearly one hundred years ago. Piaget was a psychologist who talked about the active role the child plays in their development. He thought that pretend play helped children make sense of current experiences by integrating them with past experiences. For example, in the scene described at the beginning of the article, the child may have been trying to process her own emotions about missing playing with her friends. By combining that current feeling with past interactions with playmates in which they could play in person, she could think about how to make sense of the current situation through play. Piaget proposed that all pretend play was social, even when playing alone. **Our findings are the first to provide evidence at the level of the brain to support the idea that pretend play has social benefits when children play by themselves.**

---

<sup>1</sup>Empathy and social information processing are key determinants in children's future emotional, academic and social success.

<sup>2</sup>Key findings relate to the pSTS brain region: the posterior superior temporal sulcus. The primary function of the pSTS is social information processing and empathy.

## Why are social understanding and empathy important?

Empathy and social understanding (like taking on another person's perspective) are both considered critical leadership skills and are emphasized by business and medical schools alike and in job searches. In this way, empathy is an important foundation for health, wealth, and success within and beyond childhood.

Being able to understand why a person is behaving in a certain way, we can anticipate their needs and use this information to plan our actions, which helps us be more co-operative and better collaborators. When working on a team, a better understanding of others and their emotions helps us resolve conflicts. Learning about other people and what they know and think will help us recognize who to trust and ask questions when we need help with something or want to learn more. **All of these skills together help children (and adults) improve and learn from relationships.**

## Conclusion

Following a period of lockdown and the transition to a 'new normal', it is more important than ever for kids to be sensitive to the thoughts and feelings of others. **Social understanding and empathy are essential skills for building a better tomorrow, acting as crucial ingredients for children to become the caring citizens, leaders, teachers, and parents of their generation.** Parents can be assured by what the science now tells us: playing with dolls, even by oneself, allows children to rehearse these essential life skills that will help them be a good friend, a successful student and professional, and a well-rounded adult.