Early Cognitive Development Centre

Research Results

The ECDC team would sincerely like to thank you for participating in our studies during 2023. We greatly appreciate how you have helped increase our knowledge about children's development and assisted our students in obtaining their degrees at both postgraduate and undergraduate levels. We hope you will enjoy reading the recent results of our research.

To find out more about us, visit our website ecdc.psychology.uq.edu.au

Choices when chatting with children

Past studies have shown that parents use different language when talking to boys and girls. This new research looks at whether adults prefer to use certain types of mental state language (that is, language about thoughts, feelings, and desires) and elaborated language (that is, language that explains or clarifies something in our world) when talking to children based on how the child expresses their gender.

In two studies, adults who are not parents and parents of young children were asked about their language choices when interacting with 4-year-old children. They were given scenarios where an adult talks with a child, and they had to choose the words they would use. In these scenarios, the child's gender expression was shown as masculine, feminine, or gender-neutral.

Results showed that both non-parents and parents preferred mental state language significantly more for feminine and gender-neutral children compared to masculine children. Adults also preferred significantly less elaborated language for gender-neutral children compared to masculine and feminine children.

These findings suggest that how a child expresses their gender can affect how adults talk to them. Understanding this can help create more inclusive and language-rich environments for all children, no matter how they express their gender.

Do 4- to 7-year-old children continue to copy when it is costly?

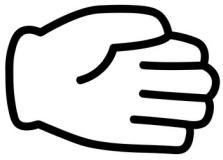
This research explores imitation and rituals. Past studies have found that children tend to rely on copying when learning new social skills. However, we know little about children's responses when copying others is costly to them (i.e., it takes time, or they lose out on something). Do children continue copying what they have seen others do, or do they devise strategies when learning costly rituals?

In the current study, 4- to 7-year-old children were given the opportunity to win stickers by placing some containers into a robot box before its lid closed. In the first two conditions, an adult demonstrated how to place the containers into the box, incorporating either ritualistic actions (i.e., a set of actions that had a purpose but took much time) or non-ritualistic actions (i.e., a set of irrelevant actions that took much time). Both approaches were slow to execute and, hence, costly in the number of stickers that could be earned before the lid closed. In a third condition, children were not shown any demonstration and were, therefore, able to independently develop their own individual way of placing the containers into the robot box before its lid closed.

We found that children copied the ritualistic actions precisely and only earned a small number of stickers, whereas children ignored the ritualistic actions and earned the maximum number of stickers. This highlights the strikingly strong tendency of young children to learn social skills through rituals, even at a cost to themselves, pointing to their roles as "cultural magnets".

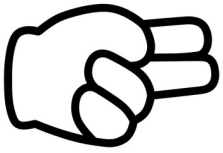
Do 6-year-old children imitate without thinking?

Automatic imitation means copying someone else's actions without even realising it. It's related to how we understand what others are doing, their thoughts, and language. In the past, we've studied automatic imitation using computer games, but they might not really show if it's happening naturally.



So, in this study, we had 6-year-old children play a game of "scissors, paper, rock." In one round, the child and the person they were playing with were blindfolded so they couldn't see each other's moves. In the next round, only the other person was blindfolded, and the child could see what they were doing. If automatic imitation was happening, we thought the child would copy the other person more when they could see them.

But when we looked at the results, we didn't find a difference in how often they copied the other person when they could see them compared to when both players were blindfolded. This means that automatic imitation may only happen in specific scenarios, and we need to investigate this further to understand how 6-year-old children are automatically imitating.



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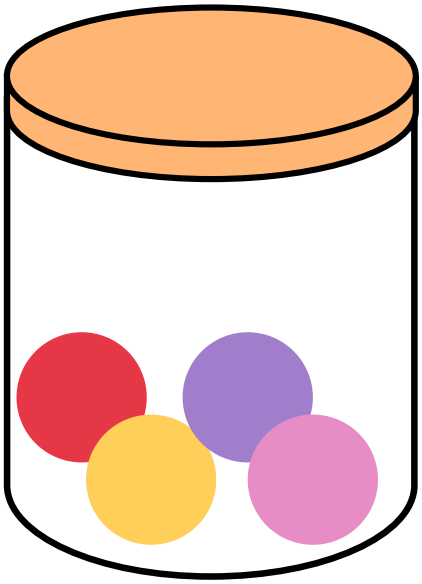
What information do 6- to 9-year-olds consider when making decisions?



Every decision we make is founded on options, with information for and against each choice we might make. For example, when deciding whether or not to take a jacket when you leave the house, you might base your decision on the weather report, what other people around you are doing, or the consequences of the decisions you've made in the past.

Recent research suggests that when adults make a decision in a probabilistic task, they will typically choose the most statistically likely option. However, when asked how sure they are of their decision, their confidence will change based on the evidence for options they did not select.

In this study, children saw a probability based game, in which balls of different colours go into a machine that randomly selects one. In comparison to adults, children who chose the most likely colour to be selected were not influenced by the rest of the colours in the display.

Therefore, our research indicates that children calculate their confidence in line with relevant information, in comparison to adults who factor in irrelevant information. In this way, children's confidence is more rational than adults.

HELP US UNDERSTAND HOW PLAYING WITH TOYS HELPS CHILDREN LEARN

Mothers and their children aged 3.5- to 5-years can participate in a study at The University of Queensland's Early Cognitive Development Centre, Brisbane.

Read books, play with toys, and receive a gift and certificate for participation!

Scan the QR code to participate OR for more info, email c.farrell@uq.net.au

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How do 2- to 5-year-olds with language delays learn about others?

During early childhood, children learn how others think, feel and act. Children who do this well are generally more socially skilled and accepted by their peers. We know that conversations between mothers and their children are essential for helping children to learn about others. Throughout 2022, researchers have been running a study with families looking at how mothers talk to different children within the same family when one sibling experiences a delay in developing language. This knowledge will help us better understand the development of social thinking in children who experience language delays, provide helpful information for parents, and lead to better support for children with social challenges.

Researchers are looking for families with sibling pairs between the ages of 2.5 and 8 years where one sibling has a language delay, AND one sibling is typically developing. If this applies to your family, we would love to have you participate in the study. The study involves a single 1.5-hour visit to the ECDC.

If you're interested in participating, contact Aisling a.mulvihill@uq.edu.au. **Participating families will receive a $20 gift card.** Please also share this study with any interested families who are able to participate.

How do 6- to 9-year-old children use reminders?

Reminder setting is arguably one of the most widespread strategies to prevent memory failures. We have developed many methods and devices specifically designed to assist us in functioning efficiently day-to-day, from setting alarms to keeping calendars. As adults, we are well equipped to evaluate our unaided memory capacity and flexibly employ external support when necessary. However, little is known about how children manage internal and external cognitive resources. In this study, we examined how children begin to perform this delicate balancing act between mind and world: weighing up when to rely on their unaided capacities and when to offload cognitive demand in a memory task with varying degrees of difficulty.

This study tasked children aged 6- to 9-years with remembering the hiding locations of coins under an array of 25 cups. Children initially had to complete this task unaided before being introduced to “tokens” that could be used to mark the hiding locations of coins (i.e., a reminder). In the final phase of the task, children were given limited tokens to distribute across the hiding conditions. Finally, children were given the opportunity to reflect on their strategy and adjust it.

We found that 8- to 9-year-olds allocated more tokens to more difficult trials proportionately, whereas 6- to 7-year-olds only did so retrospectively. Younger children were more likely to search for targets in reverse order, first selecting the last coin hidden. In contrast, older children were more likely to rehearse and recall targets in their original hiding sequence – first selecting the first coin hidden. Such findings show how children begin to reflect on their cognitive limits, update their strategies and seek workarounds!

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Help us understand how babies learn to imitate!

Our study aims to investigate how playtime will affect babies' imitation abilities. You will be asked to bring them into our labs first when they are 4.5 months old and again when they are 6 months old. They will participate in an imitation task where they will watch a model demonstrate facial expressions and hand gestures, and we will record them to see their responses. Between the two sessions, we hope caregivers can facilitate a 10-minute playtime daily to the best of their ability. Further details about this will be provided.

As we are testing at such a young age and it takes time to organise sessions, we are looking for infants aged up to 4 months, including if they have not yet been delivered. We would love to hear from you even if they are not yet the right age and get back in touch to organise the sessions when they are.

Families will receive a gift and certificate for their little one and a $20 gift voucher for their travel time.

If you are interested in participating or have any questions, please **contact Liz at e.puah@uq.edu.au.**

Does taking a photo affect 4- to 11-year-old children's memory?

Adults often take photos to help themselves remember information and events in the future. When you take lots of photos on a family holiday, for example, you know that you'll be able to look at the photos later on to help yourself and your family remember all the fun you had. However, some studies suggest that taking photos can decrease adults' memory of events if they become unavailable, like if you accidentally delete them or lose the SD card. Many children like to take photos these days, but how might this affect their memory?

In this study, 4- to 11-year-old children had to remember the locations of some coins that were hidden in jewellery boxes. For some boxes, children were able to take a photo of the coins before the lids were closed, and for other boxes, children were told they had to remember the coins using their own memory. We then tested the children's memory of the coins, but we didn't give them access to any of the photos they had taken.

When children had taken a photo of the coins, they performed worse on the memory task than when they had not taken a photo of the coins. This suggests that children don't try as hard to remember information after taking a photo, probably because they expect the photo to "do the remembering" for them.

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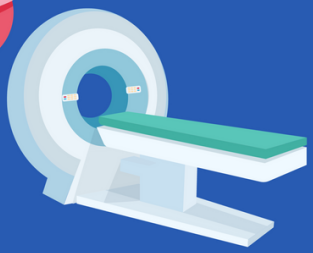
How do 4- to 9-year-old children experience regret and relief?

It's helpful to know when other people feel regret or relief because it can help us adjust our behaviour, especially when we're trying to be helpful to others. However, to understand if someone else feels regret or relief, we need to figure out what they thought could have happened differently correctly. Previous research hasn't clearly answered whether and when children can do this.

In this study, 4 to 9-year-old children watched some videos on an iPad. In the videos, actors had to choose between two boxes. Children saw the actors show happy or sad expressions depending on what was in the box they picked. Then, the actors revealed what they didn't choose in the box and made another happy or sad face. The important part was that the contents of the unchosen box could be better or worse than they had chosen.

If children could identify regret, they would say that when the actor looked sad after seeing the unchosen box, it's because they wished they had picked the better one. Similarly, if children could identify relief, they would say that when the actor looked happy after seeing the unchosen box, it was because they were glad they didn't pick the worst one. The results showed that around 6-years-old, children start to understand when someone feels regret or relief based on their facial expressions about what could have happened differently.

HELP US UNDERSTAND HOW WE LOOK AT DOGS FACES!



Receive $40 for your time & travel

We are looking for children between 8 - 12-years-old to participate in our study. We are interested in whether children can read dog faces and if this capacity can improve kids' social skills.

MRI scans will take around 1-hour and are harmless to children without metal implants or claustrophobia.

Scanning will occur at the Centre for Advanced Imaging at the UQ St Lucia campus.

For more info, email c.farrell@uq.net.au or scan the QR code.

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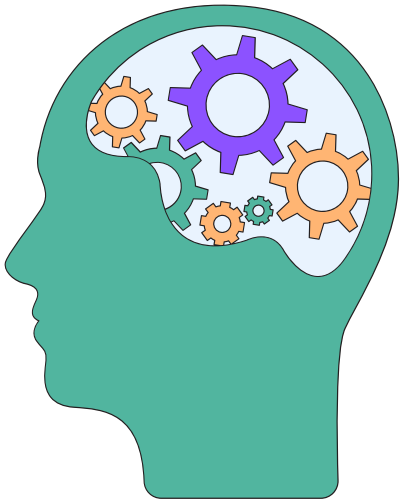
Can artificial intelligence improve 6- to 11-year-old children's creativity?!

ChatGPT is a web-based artificial intelligence (AI) tool that provides human-like responses to questions and prompts. Not long after it was released in 2022, many educators expressed concern that children would begin using ChatGPT to write essays and do homework, which might interfere with their learning of critical knowledge and skills. However, others have suggested that ChatGPT is just another problem-solving tool (a bit like a calculator) and that we must teach children how to use such AI tools appropriately in the future.



One possible benefit of AI tools is "creative inspiration". In this study, we first gave 6- to 11-year-old children a creativity test by asking them to think of different ways to use everyday household objects like a cup and a shoelace. We then exposed some of the children to answers generated by ChatGPT. Finally, we gave all children a second creativity test with new objects.

We found that children who saw the pre-recorded ChatGPT answers showed a greater improvement on the second creativity test than children who did another activity (drawing a picture on an iPad). This suggests that exposure to AI-generated content might help children think of new creative ideas independently. However, it is still possible that AI tools could have negative effects on children's learning and development, and much more research on this topic is needed.

Help us understand how children decide what and who is worth copying!

Our research explores how children imitate between the ages of 3- and 6-years. We know that children are great at copying the behaviour of others and will imitate even when it is costly. Children copy behaviours that are less efficient and also choose to copy even when they have the option to receive a material reward instead. It is unclear whether children can use information about a demonstrator's competence or skill to help inform their decisions about imitating and getting a reward.

In our study, 4- 6-year-old children are shown demonstrators who were either competent or incompetent at different tasks. Children are then invited to play a copying game to win stickers or give up these stickers and imitate the demonstrator instead.

We are interested in finding out whether children are more likely to copy demonstrators who are culturally-aware and how the competence of a demonstrator impacts children's cost and reward reasoning.

If you are interested in participating in this study, please email Jane Minogue at j.minogue@uq.net.au or scan the QR code.

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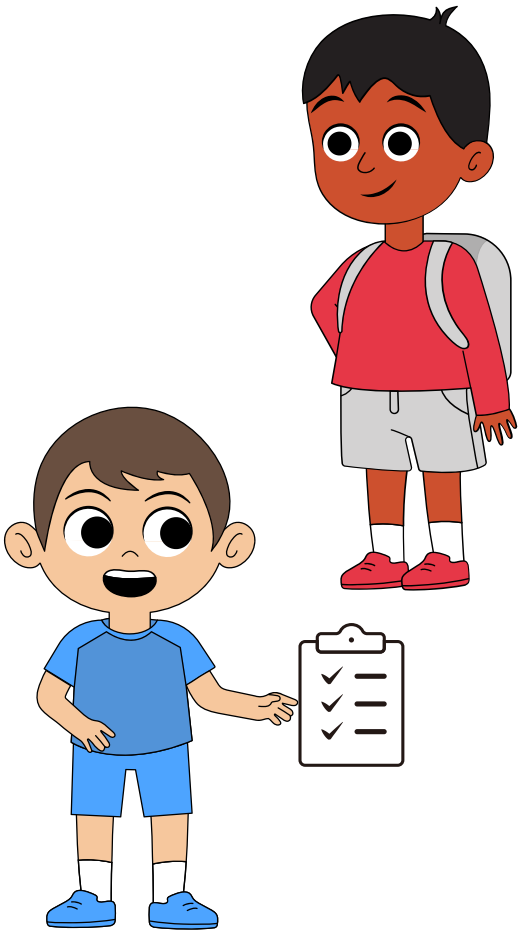
When do kids understand why it's helpful to use gadgets and reminders?

Foresight means thinking about and planning for the future. Scientists want to know when children start to understand this. Some research says children as young as 3-years-old already show signs of being able to think ahead.

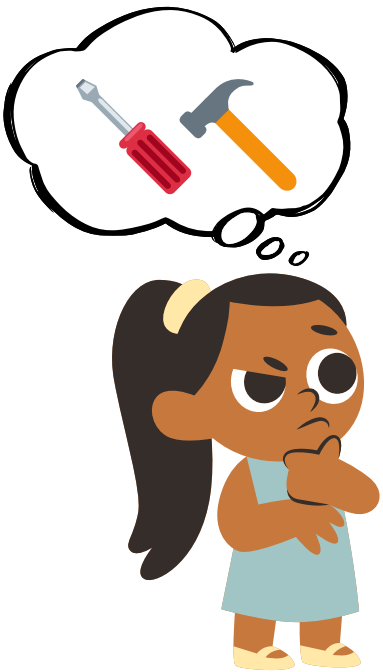
People use foresight to make things easier for their minds and bodies. For the mind, it might be actions like setting alarms or writing a shopping list. It might be a tool for the body, like using a backpack to carry stuff and free up hands.

In this study, children heard stories about friends trying to do things. In some stories, friends used their minds to make things easier, like setting reminders. In other stories, friends used objects to make tasks easier, like using a backpack.

We then asked the children who they thought would do the task best. The results showed that children improved at recognising ways to make physical tasks easier as they got older, starting at age 3. However, recognising ways to make thinking tasks easier didn't show much change until after age 4. Together, this demonstrates that as children develop, they may learn to recognise how to make physical tasks easier before they learn how to make thinking and remembering easier.



At what age can children construct a tool to solve a future problem?



Children are good at using tools and being creative, even when they are young. They use tools to explore and solve problems. Sometimes, they don't have the right tools for a job, so they need to plan ahead and make something useful. To investigate when children develop skills to plan for future problems, we conducted two studies.

In the first study, we gave 3- to 5-year-olds a problem to solve: getting a bucket out of a narrow tube. But there were no tools around to help. Instead, we took them to another place to play a game for 5 minutes. After that, we gave them a pipe cleaner and said they could shape it however they wanted. The cool part is that they could take it back to the first place. The 3- and 4-year-olds made shapes randomly, but the 5-year-olds thought ahead and made a hook shape, showing they were planning for future problems.

In the second study, we gave 3- to 7-year-olds two similar tasks: pushing a ball out of a narrow tube. One task was twice as long as the other. In the first place, they saw the longer task, but there were no tools. Then, they went to the second place to do the shorter task, knowing they'd return to the first place later. In the second place, they could use dowel pieces to make a tool. The younger children made tools only long enough for the short task. But the older children made longer tools, preparing for the longer task later. This tells us that children can make tools for today's problems when they're young, but they continue to improve at making tools for future problems between ages 3 and 7.