

# Early Cognitive Development Centre

## Research Results



The ECDC team would sincerely like to thank you for participating in our studies during 2025. 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](http://ecdc.psychology.uq.edu.au)*

### *More than words: How adults talk differently to children*

This study looked at how adults change the way they talk depending on how a child looks in terms of gender – whether the child seems more masculine, more feminine, or neutral. Adults included both parents and people without children.

We were especially interested in two types of talk. The first was talk about thoughts and feelings (sometimes called “mental state language”), such as “She thinks it’s her turn” or “He feels left out.” The second was elaborative talk, where adults add extra detail and explanation to keep the conversation going.

Adults said they were less likely to use “thoughts and feelings” talk with children who seemed more masculine, compared with children who seemed feminine or more gender-neutral. Mothers also reported using more of this kind of talk than fathers. Surprisingly, children who seemed more neutral in their gender expression were described as getting the least extra detail and explanation in conversations. Overall, the findings suggest that how a child looks, and the gender signals adults pick up on, can quietly shape everyday conversations. This highlights the value of offering rich, warm, and inclusive talk to all children, regardless of their gender.



## *How do children aged 4 to 9 years think about the past and future?*

Humans can mentally “time travel” – we can remember past events and imagine different ways the future might turn out. Young children, from around 3- to 4-years, can talk about things that have happened to them and imagine future events. But it seems to take longer before they can think about how the past might have been different.



In this study, we used a visual timeline to explore how children aged 4 to 9 years think about both future possibilities and “alternative pasts”. Children heard a story about a character searching for hidden treasure. The treasure could be in a place the character might visit in the future, or in a place they could have visited in the past. Children were shown these options on a timeline and asked where the treasure could be.

We found that 4- to 5-year-olds mostly focused on future possibilities. Children aged 6 to 7 years started to consider both future and alternative past possibilities, and by 8 to 9 years, children consistently thought about both. These findings suggest that by early primary school, children are beginning to imagine not only what might happen, but also what might have happened.

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## *How do children aged 6 to 11 years plan and adjust their thinking?*

As children grow, they get better at noticing what a task needs from them and adjusting how they think and act. This study explored how children aged 6- to 11-years plan ahead and use feedback to change their behaviour in a fast-paced, touchscreen game.



Children played a game where they sometimes had to switch between different rules (for example, sorting pictures one way on some trials and a different way on others). In the first part of the game, the timing was fixed for everyone. In the second part, children could choose how much time to give themselves to get ready before each trial.

Some children saw a helpful reminder on the screen for longer, while for others, this reminder quickly disappeared, making the task harder and encouraging them to prepare in advance. As expected, children in the harder version found the first part more challenging. However, when they later had control over their timing, they did not choose to give themselves extra preparation time. Even so, children in the harder version improved more across the two parts of the game and ended up performing just as well as the other group. This suggests that practice with a trickier task can help children learn to think more efficiently within the same amount of time.

## How do children aged 3 to 6 years think about uncertainty?

In everyday life, we often make decisions without knowing for sure what will happen next – like guessing the outcome of a coin toss or whether it will rain tomorrow. This study explored how young children start to think about these “not sure yet” situations, and how confident they feel about their choices.

Children aged 3- to 6-years played a prediction game on an iPad. They saw a jar filled with coloured balls and had to guess which colour would be drawn next. Sometimes the answer was obvious (for example, the jar was almost all one colour). Other times it was much harder (for example, many different colours were mixed together). After guessing, children showed how sure they felt by filling up a virtual cup on the screen.

Even 3-year-olds seemed to notice when things were more uncertain: they took longer to decide when there were many colours in the jar. By around 4 years, children started to show different levels of confidence across easier and harder choices, and by 5 to 6 years, their confidence was highest when their guess was more likely to be right. These findings suggest that younger children feel uncertainty, while older preschoolers begin to reflect on it, taking an early step toward “thinking about their own thinking.”



## How might children aged 4 to 11 years think about “what if” situations?

Loneliness is a feeling of disconnection that comes from sensing a gap between yourself and others, rather than simply being on your own. One idea is that people can feel more lonely when they imagine how things could have been better. This study explored when children start to use this kind of “what if things were different?” thinking when judging how lonely someone might feel.

Children watched short cartoon stories about two friends who ended up playing alone. In one version, a child stayed at home because the gate was locked and they had no choice. In another version, the gate was open and the child chose to stay home while their friend went outside to play. Children were then asked in which situation each character would feel lonelier.



Older children, especially those aged 10-to 11-years, were more likely to say that characters would feel lonelier when they had missed out on a better option (for example, when they could have gone outside but chose not to). Younger children did not show this pattern. These findings suggest that using “what if” thinking to understand loneliness may develop gradually and may become more important as children approach the later primary school years.

## How do children aged 3 to 6 years decide who to copy?



In this study, we wanted to understand how children aged 3- to 6-years decide who to learn from and when they might choose to do things their own way. We were especially interested in whether children care more about someone who seems to know “the right way” to do things in their social world, or someone who is very good at getting a job done quickly and well.

In the first part of the study, children watched an adult open boxes to find small rewards. Sometimes the adult used extra, unnecessary steps, and sometimes they were more direct. The adult was described as either very good at following social rules or very good at solving problems efficiently. Children tended to copy more from the person who seemed socially knowledgeable, even if that person wasn’t the most skilful at the task. This suggests that children care a lot about learning “how things are done” in their social world.

In the second part, we focused more on practical skill. When it was clear that one adult was especially good at opening the boxes, children copied that person more. Overall, the findings show that children weigh up both social and practical information when deciding who to copy.

## How do children aged 4 to 7 years balance safe and risky choices?

Good decision-making often means weighing up “How likely is this to work?” and “How good will it be if it does?” This study explored how children aged 4- to 7-years make these kinds of choices using a simple, game-like task.

Children played a game where a reward (like a token) could roll out of one of two ends of a tube. They had to choose between a “safe” big bucket that always caught a small reward, and a “risky” small bucket that sometimes missed—but, when it worked, earned a bigger reward. Across different rounds, sometimes the safe choice was best, sometimes the risky choice was best, and sometimes both were equally good.

Children, even at the younger ages, showed some ability to choose in sensible ways. As children got older, many became better at noticing when it made more sense to take a chance versus play it safe. By around 7-years-old, some children began to favour the risky option, even when this was not the best choice. Children’s choices were also influenced by how “lucky” they felt in earlier rounds. Overall, these findings suggest that children’s ability to weigh up risks and rewards grows across the early school years, alongside changing feelings about risk-taking.

## *How do children aged 5 to 12 years see their social groups?*

Belonging to groups – like family, friends, school, or sport – is a big part of how children understand who they are and where they fit in. This project explored how children and young people think about their own group memberships using a child-friendly online tool called Social Identity Mapping (oSIM).

In this activity, children created a “map” of their social world on a tablet or computer screen. They added circles for different groups they belong to (for example, family, friendship groups, school classes, sports teams, or clubs) and showed which groups were most important to them. They could also show when groups overlapped, such as when friends were also teammates or classmates.



Children from about 6 years of age were able to understand the task and complete it in a meaningful way. Most children and early adolescents engaged well with oSIM and produced clear, easy-to-understand maps. The most common groups they included were family, friends, school, and sport. These findings suggest that oSIM is a practical, engaging way to capture how young people see their own social worlds. This, in turn, can help adults understand which groups matter most for children's sense of belonging and well-being.

## *Do storybooks help children aged 4 to 5 years be more compassionate?*

Young children don't always help when someone is upset, especially if it means giving up something they really want. This project explored whether reading a storybook about kindness and caring could encourage more helping in children aged 4- to 5-years.

Families were asked to read with their child at home for a week. Some families read a storybook that focused on compassion (for example, noticing others' feelings and helping them), while other families read a different story. After the week of reading, children visited the lab and took part in a set of helping activities, where an adult appeared to need their help, sometimes in ways that would involve a small personal sacrifice.



We expected that children who had read the compassion storybook would be more willing to help than children who read the other book. However, children in the two storybook groups helped at similar levels. Even though the compassion storybook did not boost helping in this study, the project showed that at-home reading programs are a practical way to explore how storybooks might support caring behaviour in young children.

## *How do children aged 4 to 9 years use “thinking tools” in everyday life?*

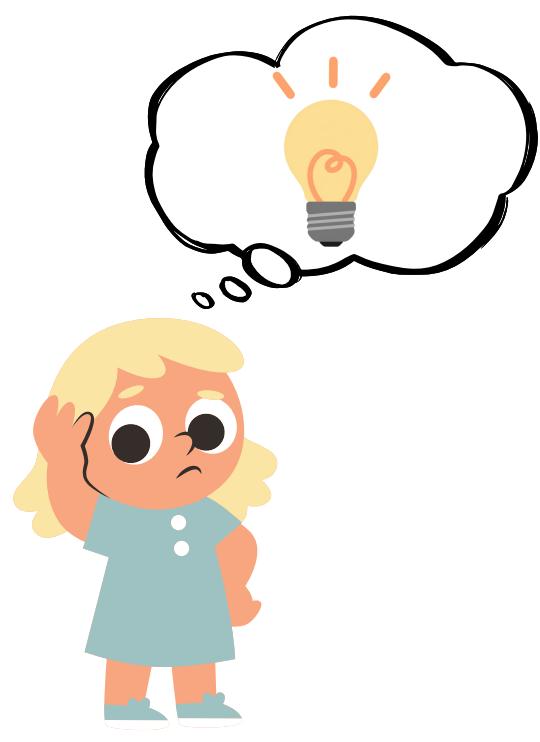
Even adults often use “thinking tools” to make life easier – for example, setting reminders on our phones, leaving objects in special places so we don’t forget them, or asking someone else for help. This study looked at how children aged 4- to 9-years come up with these kinds of strategies in everyday situations.



Children listened to short stories about common challenges, such as remembering to bring something later, finding their way, or solving a tricky puzzle in their head. After each story, children were asked what the character could do to make the task easier.

Their answers were grouped into three kinds of “thinking tools”: using objects (like putting something by the door), using technology (like setting an alarm), and asking other people for help. Younger children used some of these strategies, but from around age 6-years, children started suggesting a wider range of helpful ideas, especially using objects and technology. Asking others for help, however, was common even in the youngest children. Overall, the study suggests that children become more flexible problem-solvers across the early school years, but may still favour certain types of strategies over others.

## *How do children aged 3 to 5 years think about possibilities?*



Being able to think about “what could happen” rather than just “what is happening” is an important part of decision-making. This study explored how children aged 3- to 5-years understand possibilities using two different kinds of games.

In one game, children watched a ball disappear into a tube that split into two ends, and had to guess where it might come out. In multiple other games, children had to work out where a hidden object could be (i.e., in which box), based on limited clues.

Previously, researchers have assumed that these different games measure the same skill: children’s ability to think about possibilities. Our study tested this idea directly. As expected, older children generally did better than younger children, suggesting that possibility thinking develops across the preschool years. However, the different games did not always go together in the way we expected. We found that children’s performance in the tube game was linked with just one of the box games, but not the others.

# How do children aged 5 to 10 years make sense of big life questions?

This study explored how children and their parents think and talk about religious and fantastical figures (like God, angels, or magical characters), and how these beliefs are passed on within families. It is part of a large international project looking at beliefs in many countries around the world.

In the Australian part of the study, parents and children first had a guided conversation about big life questions, such as “How do we get better when we are very sick?” and “Why do natural disasters happen?” Picture prompts were used to help get the conversation started. Then, children took part in activities about topics like invisible things, special celebrations, and social rules, while parents completed a related survey.



Early findings suggest that all families drew on a mix of ideas. For example, non-religious families tended to lean more on scientific explanations (like visiting a doctor), whereas religious families often blended practical ideas with religious ones (such as prayer). Across all families, children showed strong everyday knowledge about health and nature, growing ideas about relationships and where the world came from, and rich imagination when thinking about spiritual or “big life” questions.

## How do children aged 4 to 9 years plan to remember important things?

Remembering isn’t just about how much we can keep in our heads – it’s also about how we organise information and use helpful supports around us. Children, like adults, can use clever tricks to remember, such as making reminders or marking important things. This study explored how children aged 4- to 9-years start to plan and manage their memory on purpose.

Children played a memory game where “coins” were hidden under six cups. Some coins were worth more than others, and sometimes the cups were shuffled to make the game trickier. In some rounds, children were given special “tokens” they could place on cups to help remember where the coins were.



Even the youngest children could use their tokens in smart ways, often choosing to protect the most valuable coins. Older children became even more strategic. They were more selective about when to use their tokens, saving them for the hardest rounds and the most rewarding coins. These findings show that memory development is not just about being able to remember more. It is also about learning to plan ahead, focus on what matters most, and use simple tools and tricks to make remembering easier in everyday life.

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