



TEACHING & LEARNING  
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NĀU I WHATU TE KĀKAHU, HE TĀNIKO TAKU

# Moments of wonder, everyday events: Children's working theories in action

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This two-year research project explored children’s working theories in action. We looked at the ways young children expressed their working theories and how these were understood and fostered in Playcentre<sup>1</sup> environments. The findings show ways that children express and develop working theories, how practitioners understand these, and how best to respond to this learning.

## Key findings

1. Working theories are rich sites for deep and complex learning.
2. Fostering working theories presents a number of dilemmas for adults working with young children.
3. There are particular ways adults can “be”, and interact with children, that can nurture children’s working theories.

## Major implications

1. Adults working with young children need to be attuned to the variety of ways children express and explore their working theories.
2. Adults working with young children need to explore a range of specific intentional strategies for encouraging the development of children’s working theories.
3. Knowing the child well contributes significantly to the recognition of the development of the child’s working theories, and parents and caregivers are pivotal in this knowing and recognition.
4. Some working theories can be recognised as particularly interesting to children. These can be understood as “islands of interest” or “islands of expertise”.

## The research

This project was a collaboration between the Canterbury Playcentre Association, CORE Education and the University of Waikato. Co-ordinators from five Canterbury Playcentres and an Association representative became what we call “practitioner researchers”, with the two experienced researchers, one from CORE Education and the other from the University of Waikato, leading the project. Parents at each of the five playcentres were encouraged to participate in the project, and many took this opportunity. The premise for the collaborative enquiry was that the practitioners were “being researchers” rather than “being researched”.

The project aimed to better understand children’s working theories, and how to support this learning in early childhood settings. There has been little investigation into young children’s working theories in this country, even though working theories are a key outcome in Te Whāriki (Ministry of Education, 1996).

### What are working theories and why are they important?

Te Whāriki defines working theories as a combination of knowledge, skills and attitudes that contribute to children’s development of learning dispositions (Ministry of Education, 1996). Working theories were derived from Guy Claxton’s (1990) view that knowledge consists of a large number of purpose-built situation-specific packages called “minitheories”, and that learning “involves a gradual process of editing these minitheories so that they come to (i) contain better-quality knowledge and skill, (ii) to be better ‘located’ with respect to the area of experience for which they are suitable” (p. 66).

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<sup>1</sup> Playcentre is a parent-led early childhood service that specialises in child and adult education. Playcentre has existed throughout the country for more than 60 years and is unique to Aotearoa New Zealand.

Children begin to own the ideas and beliefs of their culture and begin to make sense of their worlds through interactions and activities (Rogoff, 2003). When children are engaged with others in complex thinking, they are forming and strengthening their working theories. Children develop by engaging in cultural activities and using the tools provided by culture, and through interactions with more skilled partners in their zone of proximal development (Vygotsky, 1978). Te Whāriki recognises this, stating that children’s working theories develop in environments where they have opportunities to engage in complex thinking with others, observe, listen, participate and discuss within the context of topics and activities (Ministry of Education, 1996). Interacting with children in this way requires skilled and flexible adults who can move between scaffolding and co-construction with learners (Jordan, 2004). Our project aimed to contribute perspectives on how that skill and flexibility can be achieved.

## Our research approach

The project considered the following questions:

- How do children express their working theories?
- How do adults recognise unspoken theories?
- How do adults understand children’s working theories? What features of the Playcentre context support this understanding?
- What is the adult’s role in supporting children’s working theories?
- What are some of the dilemmas for adults in supporting children’s working theories?
- How do working theories develop over time and context and what influences this?
- How can documentation be used to support and extend children’s working theories?

Practitioner researchers, supported by the experienced researchers, gathered learning stories, made written observations, collected photographs, parents’ written and spoken comments and observations, and made video- and audio-recordings of interactions with children. These were developed into case studies. We employed a systematic and rigorous approach to analysis and reflection through individual and group processes involving the whole research team.

The first months of the project concentrated on the questions “How do children express their working theories?” and “How do adults recognise unspoken theories?” Practitioner researchers gathered examples of children’s working theories in action in their day-to-day work with children, which presented additional questions. For example:

- Is every action or comment a working theory?
- How active should the adult be in encouraging a child’s working theory?
- How might we avoid the working theories of adults getting in the way of children’s working theories, especially when children’s theories broach topics that the adults find sensitive
- How do we help other adults to value and contribute to children’s working theories in ways that nurture and “grow” a theory rather than shut it down?
- Are there specific strategies that are particularly good for promoting the development of working theories?

To answer these and the remaining research questions, each practitioner researcher nominated specific strategies to test over the next year, which provided 13 case studies. Table 1 illustrates four of the strategies from six case studies, and examples of key findings.

**Table 1. Examples of key findings in relation to some of the strategies designed to promote the development of working theories**

Strategies	Case studies	Examples of key findings
<p>Using A4 photos and video:</p> <p>Children’s “working theories play” is videotaped and photographed and the videos are revisited and discussed with children at “coming together time”.</p>	<p><i>Tim and the water: how a young child’s working theories about water travel develops over time.</i></p> <p><i>Growing islands of interest, growing a community of learners.</i></p>	<p>Interest, together with the right strategies, proved to be a springboard for complex, intense learning for others. The strategies of using photos and video together with well-placed questioning and genuine listening meant one young child’s island of interest could compel a community of learners to develop an island of interest together.</p>
<p>Family notebooks:</p> <p>Parents are introduced to the language of working theories and asked to document examples of their child’s islands of interest and expertise in action.</p>	<p><i>Tapping into learning at home and creating a shared language.</i></p> <p><i>Seeing with new eyes: Understanding babies’ working theories.</i></p>	<p>Documentation is important in supporting continuity for children, but it must have clear purposes if it is to contribute to children’s working theories. Documentation can help us make meaning of children’s learning. This, together with reflective discussion, is fundamental to any educational setting where adults strive to understand children’s learning and put this understanding to good use (Drummond, 1993).</p> <p>Developing a shared language and understanding of working theories can create many opportunities for meaningful dialogue about the learning of all children. Recognition of unspoken theories may shift the ways the youngest members of learning communities are seen and understood as learners.</p> <p>There is potential for richer learning when deliberate connections between home and centre are made. These connections, however, require intentional strategies. Stronger connections create greater continuity in experience and learning between home and other education settings, allowing opportunity for learning to be encouraged and supported in diverse and new ways. We cannot assume existing mechanisms for sharing information about children are focused on encouraging children’s islands of interest or expertise, or that these are working for all children or all parents.</p>
<p>Children’s dictated books:</p> <p>Children are invited to turn their theories into books by dictating them to a practitioner researcher.</p>	<p><i>“So Saturday, Sunday and Monday I can be like Bindi and then the rest of the time I’ll be a palaeontologist.”: A case study of Sarah-Kate’s working theory development.</i></p>	<p>Margaret Carr (2009) described a four-track (ABCD) framework for strengthening key competences. The development of working theories may lend itself to a similar analysis. In Sarah-Kate’s case study, we saw increasing agency and authoring (A), breadth (B), continuity (C) and depth (D).</p> <p>“Low power” adult strategies gave Sarah-Kate agency. Nevertheless, the adult interest and intentional encouragement seemed important in developing the working theories for this child.</p> <p>The practitioner researcher began to think of her role in supporting the development of working theories as more about providing opportunities for children to express, share and refine their theories than about being a holder of “knowledge”. She began to see the place of creativity and expression of ideas as particularly rich opportunities for the development of working theories, not only for Sarah-Kate, but also for others.</p>
<p>Inviting children to draw their ideas while audio-recording conversations with children and analysing transcripts.</p>	<p><i>Phoebe’s honey machine.</i></p>	<p>Creating opportunities for children to share their ideas may include adults asking questions but other valuable strategies included wondering with children and allowing sufficient wait time and spaces for children’s ideas to emerge. It is important to pay attention to power relationships and to listen to children and seek to understand their theories. It is easy for well-meaning adults to “hijack” the direction of a conversation or activity by responding to only part of the children’s theory or interest.</p> <p>Some of what we adults accept as fact may be dubious when put to the test. Many of the children’s theories led us to question our own knowledge and be open to moments of wonder and exploration too.</p> <p>Many examples of possible working theories emerged during interactions with children. Adults must decide which of the child’s theories to delve into more deeply, and whether the theories are likely to be enduring or fleeting. These decisions must be made with sensitivity.</p>

# Implications for practice

Working theories are about thinking and acting in ways that work to express, communicate, develop and strengthen ideas and understandings about the world. Our ideas and understandings of working theories are not limited to particular domains such as scientific thought; rather we have been interested in children's creativity, imaginings, problem seeking and solving, theorising, acting and interactions as they engage in everyday enquiries and conversations with others. This provides richness and breadth but can potentially leave practitioners and parents unsure how to respond. In overcoming this issue, we have found the notion of islands of interest and islands of expertise and the associated language, in combination with the various strategies discussed earlier, particularly powerful in helping adults notice, recognise and respond to children's working theories in action.

## Islands of interest and expertise

Initially we were drawing on Claxton's three simple analogies to describe minitheories—*islands*, *amoebae* and *computer files*. We found that working theories develop and morph as a child's knowledge of the world, skills and strategies, attitudes and expectations, change through experience. This seemed to fit most closely with Claxton's (1990) island analogy, where Claxton refers to what we know as being like islands in a sea of what we do not know. When we experience something new we are either "on firm ground", because we relate it easily to what we know—our island of knowledge—or we are at sea, uncertain and unsure how to interpret this experience or how to behave. Islands may eventually connect as we come to realise they are not dissimilar. Likewise, what was once thought of as one island could, with greater experience, become two.

We recognised the strong influence of children's interests on their learning. Some interests were fleeting, while others were more connected or revisited more frequently by children. We adapted Claxton's island analogy to create a metaphor for working theories that reflected sustained interest, and called these "islands of interest".

We used specific strategies to see if we could "grow" some of these islands of interest: making them more complex, more connected, and more compelling to children. Our data resonated with Crowley and Jacobs' (2002) view that knowledge deepens and becomes more complex over time as children find and develop areas of interest that become islands of expertise. However, while Crowley and Jacobs gave an example of this happening over time through parent and child interactions, we trialled deliberate strategies to foster this development within the early childhood education settings.

We found that by using the language of islands of interest and island of expertise, a shared language developed that helped the adults to understand what learning to take notice of and what learning to prioritise. Once adults could identify a child's island of interest or expertise, they were better able to delve into the possible working theories within these interests.

During the project, we often referred to the use of the shared language as a means of putting our "working theories glasses" on, and this practice contributed to "seeing" the child and their learning differently. It helped adults to see themselves differently too. The adults discovered the importance of particular ways of being and interacting with children to achieve intersubjectivity, or the mutual understanding necessary for the co-construction of learning (Rogoff, 1990). Careful questioning, observation and analysis revealed many of the subtle nuances of interactions between children and adults. An important lesson was the need to slow down and really listen to children, not to the surface topic but to the deeper meanings. For example, not to ask questions about how many bees in a bee family and what bee keepers wear, if the child was puzzling about how bees make honey and what happens inside the hive. Only once adults slowed down, could they strive to understand the child's intentions and goals and avoid hijacking the direction of learning. This requires a culture of trust that an individual's theories will be taken seriously and an environment where critical thought, wondering and creativity, is encouraged and accepted as a desirable outcome for all children and adults alike.

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# Project team

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