Chapter 6
Let's Count: Early Childhood Educators and Families Working in Partnership to Support Young Children's Transitions in Mathematics Education

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Abstract *Let's Count* is an early mathematics program designed by The Smith Family and researchers from Charles Sturt University and the Australian Catholic University as a means of assisting parents and other family members to help their young children (aged 3–5 years) play with, investigate and learn powerful mathematical ideas. *Let's Count* involves early childhood educators in the role of mentors to the parents and family members of the children in their settings, providing assistance in noticing and exploring mathematics in everyday life. In 2011, I was responsible for developing *Let's Count* into the form of a distance education subject for offer to students enrolled in an early childhood teacher education degree at Charles Sturt University, as a means of sustaining the *Let's Count* initiative and achieving a wider impact on the early childhood community. In this chapter, I report on a project which followed up with former participants in the subject, and the families with whom they have worked, to ascertain the success of the *Let's Count* program in bringing together early childhood educators and families to support positive transitions in children's mathematics education. This chapter explores the ongoing effects of educators' and families' engagement with the program, and shares examples of *Let's Count* activities in prior-to-school, school, family and community contexts.

6.1 Introduction

For the better part of a decade, I have been researching with children, families and early childhood educators in the area of educational transitions. My earlier work was around transitions to school in a more general sense (MacDonald 2008, 2009), but for the most part my research endeavours have focused specifically on *mathematics* and transitions to school (MacDonald 2013; MacDonald and Lowrie 2011).

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In particular, I have been very interested for some time now in the mathematical experiences and understandings children encounter in the prior-to-school years, and the majority of my work has been devoted to gaining some understanding of the mathematics children bring with them in their transitions from prior-to-school settings to school settings. A recent project in this area has been the development of *Let's Count*, an early mathematics program designed by The Smith Family and researchers from Charles Sturt University and the Australian Catholic University as a means of assisting parents and other family members to help their young children (aged 3–5 years) play with, investigate and learn powerful mathematical ideas (Perry and Gervasoni 2012). *Let's Count* involves early childhood educators in the role of mentors to the parents and family members of the children in their setting, providing assistance in noticing and exploring mathematics in everyday life. In 2011, I was responsible for developing *Let's Count* into the form of a distance education subject for offer to students enrolled in an early childhood teacher education degree at Charles Sturt University, as a means of sustaining the *Let's Count* initiative and achieving a wider impact on the early childhood community. In this chapter, I report on a project which followed up with former participants in the subject, and the families with whom they have worked, to ascertain the successfulness of the *Let's Count* program in bringing together early childhood educators and families to support positive transitions in children's mathematics education. This chapter explores the ongoing effects of educators' and families' engagement with the program, and shares examples of *Let's Count* activities in prior-to-school, school, family and community contexts, both nationally and internationally.

6.2 Background

The past decade has seen a significant shift in thinking, with young children now celebrated as capable mathematical thinkers and learners (Balfanz et al. 2003; Lee and Ginsburg 2007). In a survey of Australian early childhood educators (Hunting et al. 2008), there was overwhelming agreement that young children were capable of mathematical activity and thought well before they started school. This result has been echoed in many other studies with the general agreement that all children in their early childhood years are capable of accessing powerful mathematical ideas and that they should be given the opportunity to access these ideas through high quality child-centred activities in their homes, communities, and prior-to-school settings (Balfanz et al. 2003; Lee and Ginsburg 2007; Perry and Dockett 2008).

However, there is a significant body of research which suggests that many early childhood professionals are reluctant to engage in intentional teaching of mathematics (Sarama and Clements 2002; Perry and Dockett 2008), and that this reluctance may be explained by concerns about overly didactic programs, privileging other parts of the curriculum (namely, language and literacy), and teachers' anxieties about their own mathematics knowledge (Cohrssen et al. 2013). A further challenge is that

those early childhood educators who *do* include mathematics education as part of their curriculum typically hold a very narrow view of what constitutes mathematics, stressing the ability to count and knowledge of numbers (Department for Education and Child Development 2012, cited in Carrington and Feder 2013). Indeed, "many pre-school educators consider practising the number-word sequence and identifying basic shapes to be sufficient in the preschool context" (Cohrssen et al. 2013, p. 96).

Doig et al. (2003) have suggested several reasons for the importance of understanding children's mathematical development in the years prior to school, including the increasing number of children participating in early childhood programs and growing recognition of the importance of mathematics in general. The work of Baroody (2000) and Klibanoff et al. (2006) has indicated that children who enter primary school with high levels of mathematical knowledge maintain these high levels of mathematical skill throughout, at least, their primary school education. Furthermore, the development of mathematical concepts in the prior-to-school years is likely to increase a child's potential for later school achievement. In a study of school readiness and later school achievement, Duncan et al. (2007) found a strong correlation between early mathematics skill and later mathematics achievement, as well as associations between early maths and other competencies such as reading and writing abilities.

Relationships among family members, children and educators can have a substantial influence on learning, including the learning of mathematics. Studies have shown a positive relationship between parental involvement in their children's learning and the achievement of these children (Civil et al. 2005; Young-Loveridge et al. 1997). However, some family members will be reluctant to 'get involved' with mathematics and early childhood educators might have to provoke such involvement. One of the aims of such provocation will be to assist the families realise the mathematical potential of their everyday activities with their children.

The importance of early childhood educators working in partnership with families in order to assist children's learning is recognised within Australia's national early childhood curriculum, the *Early Years Learning Framework for Australia* (EYLF; Department of Education, Employment and Workplace Relations [DEEWR], 2009). As stated in the EYLF:

> Learning outcomes are most likely to be achieved when early childhood educators work in partnership with families. Educators recognise that families are children's first and most influential teachers. They create a welcoming environment where all children and families are respected and actively encouraged to collaborate with educators about curriculum decisions in order to ensure that learning experiences are meaningful (p. 12).

As explained by Perry and Gervasoni (2012, p. 5):

> In order for such partnerships to become a reality, early childhood educators need to engage with families and communities in ways that are relevant, meaningful and culturally appropriate. Relationships are built upon mutual trust and respect and these need to be earned by all parties to any relationship.

As such, the *Let's Count* program is built upon the skills and knowledge of early childhood educators in mathematics and upon their skills in developing trusting and respectful relationships with the families with whom they work.

6.3 Overview of *Let's Count*

As Perry and Gervasoni (2012) explain, *Let's Count* is not a mathematics teaching program; however, it does involve early childhood educators in the role of advisers to the parents and family members of the children in their settings about ways they can notice, discuss and explore mathematics with their children. *Let's Count* includes a professional learning program for educators to assist them in their critical role of advising parents and family members. Additionally, this professional learning enables educators to consider their own pedagogical approaches in mathematics and add to their repertoire of successful practices (Perry and Gervasoni 2012).

In short, *Let's Count* has been developed with the following underlying characteristics:

- Partnerships among early childhood educators and families;
- Play and investigation for all;
- Recognition of all as potentially powerful mathematicians;
- Realisation that mathematics learning can be fun for all when it is undertaken in a relevant and meaningful context;
- Mentoring and advising of families by early childhood educators;
- Meaningful documentation of learning; and
- Strong links to the theoretical and practical bases of the EYLF (Perry and Gervasoni 2012).

6.3.1 The Importance of the Prior-to-School Years

Bredekamp and Copple (1997, p. 97) note that the prior-to-school years are "recognised as a vitally important period of human development in its own right, not as a time to grow before 'real learning' begins in school". Indeed, what children learn about mathematics in the early years is important in their transition to learning at school. The rationale for *Let's Count*'s focus on the prior-to-school years draws on the work of Duncan et al. (2007), who performed a coordinated analysis of six longitudinal data sets relating changes in early skills to later teacher ratings and test scores of school reading and mathematics achievement. They found that school-entry mathematics, reading, and attention skills were associated with later achievement, and noted that the predictive power of early mathematics skills was particularly impressive. However, Duncan et al. (2007) also cautioned that their findings did not support the adoption of 'drill-and-practice' curricula, and argued that play-based curricula designed with the developmental needs of children in mind can easily foster the development of academic and attention skills in ways that are engaging and fun. This stance is echoed in recent national statements on mathematics learning in early childhood (Australian Association of Mathematics Teachers and Early Childhood Australia 2006; National Association for the Education of Young Children and National Council for Teachers of Mathematics 2002).

The Australian Association of Mathematics Teachers and Early Childhood Australia (2006, p. 1) state that:

> All children in their early childhood years are capable of accessing powerful mathematical ideas that are both relevant to their current lives and form a critical foundation to their future mathematical and other learning. Children should be given the opportunity to access these ideas through high quality child-centred activities in their homes, communities, prior-to-school settings and schools.

Key to this is the critical importance of early childhood educators and families holding high expectations of all children's potential as mathematical learners. However, this may be inhibited by adult perceptions of, and past experiences with, mathematics. As Perry and Gervasoni (2012, p. 16) explain:

> Many adults have struggled with learning mathematics at school. Many consider mathematics to be a collection of facts to learn that do not connect to real life. Consequently, their attitudes toward mathematics are often negative, with their own experiences crowding out any possibility of seeing mathematics as beautiful and joyful. On the other hand, many adults do see the beauty, joy and usefulness of mathematics and these people most often harbour very positive attitudes towards mathematics and its learning.

As such, one of the aims of *Let's Count* is to build adults'—both educators and parents'—confidence with, and positive attitudes towards, mathematics so that young children can see that they are not only able to learn some powerful mathematics, but also *want* to do so (Perry and Gervasoni 2012). It is particularly important to foster this in the prior-to-school years because, as Henderson and Mapp (2002, p. 64) note, there is "a positive and convincing relationship between family involvement and benefits for students, including improved academic achievement".

In summary, *Let's Count* specifically targets children in the prior-to-school years for the following key reasons:

- To acknowledge that powerful mathematical ideas are developed prior to school;
- To support positive transitions from mathematics learning in home and early childhood contexts to school contexts; and
- To enhance the confidence of parents in identifying and supporting their children's mathematical development, particularly as they start school.

6.3.2 Let's Count Program Pedagogies

The professional learning within *Let's Count* has been offered in two forms:

1. a face-to-face mode, in which early childhood educators participate in two full-day professional development workshops; and
2. a distance education mode, in which early childhood educators complete six online modules and associated tasks.

The first of these modes, the face-to-face offering, was developed, implemented and evaluated by program authors Bob Perry and Ann Gervasoni (refer to Chap. 4 in this volume for further details). Following the successful pilot of the face-to-

face program in 2011, I was invited to take responsibility for the development, implementation and evaluation of a distance education form of *Let's Count*. The development of a distance education mode provided a means of sustaining the *Let's Count* initiative as well as achieving a wider impact on the early childhood community—beyond what might be possible in a face-to-face workshop mode. To date, the online offering has been completed by 184 educators.

As a means of 'enacting' the *Let's Count* principles and practices, the distance education form of the program requires early childhood educators to engage with two key pedagogical approaches—family gatherings and learning stories.

6.3.2.1 Family Gatherings

A key pedagogy of *Let's Count* is encouraging early childhood educators to implement 'family gatherings' with the children, parents, and other caregivers in their setting. Family gatherings are essentially workshops designed to allow early childhood educators to have conversations about mathematics with parents, and to assist parents to help their children learn mathematics. Family gatherings are an opportunity for educators to work with families to assist them in recognising the opportunities for mathematical development in their everyday family life. They are also an opportunity for educators to learn about, and appreciate, the unique capacities and resources of each family. Key to the family gatherings is a focus on the 'everydayness' of mathematics and the use of everyday activities and resources—no specialised games or tools are required. Family gatherings are also used in *Let's Count* as a way of engaging families and developing positive relationships within early childhood settings.These gatherings take any number of forms: for example, *Let's Count* educators have brought together a small group of families for a face-to-face workshop; they have worked individually with a small selection of families; they have gathered both physically and virtually, capitalising upon the potential of online social networks; they have held brief meetings over a period of time, or have come together for one, more extended, block of time. By way of an example, the following account from Jody, one of the *Let's Count* educators, explains the approach she took with her family gathering activities:

> I initially set up a facebook group conversation with seven parents to see if they would like to be involved. Once I had my head around what was required I set up a meeting with all the parents to discuss the project, however, I did ask parents if they could provide me with their children's interests at home so that before our meeting I could plan some mathematical games that would be of interest to the children so they could do them with their parents. It was like giving them some ideas but it wasn't something they had to do, it was just a precursor for the parents to see how they could incorporate mathematics into their children's time with them at home. There was no minimum amount required and they were all asked to let us know in the group conversation how they were going to help spur on each other and perhaps provide ideas to other families on what they were doing and what worked and didn't work for them [Jody, NSW].

Educators have been encouraged to think about what might work best for the families in their service, and to think creatively about how they might 'gather' families

around the topic of early numeracy development. The main thing educators were encouraged to remember—and emphasise to families—is that family gatherings are an opportunity for early childhood educators and parents to work together to explore the mathematics in children's lives.

6.3.2.2 Learning Stories

A second pedagogical approach employed in *Let's Count* is the writing of mathematical learning stories. Participants in *Let's Count* are asked to use learning stories to document the mathematical learning of children who have participated in the family gathering. While no set format for the learning stories is given, the educators are encouraged to include three key features in their stories:

- Description of the context and what happened;
- Analysis of the child's mathematical learning; and
- Suggestions for how this learning might be further developed (with a focus on what families can do).

Educators are encouraged to *unpack* the mathematics learning which has taken place, attending closely to the mathematical concepts being developed. For example, rather than just saying "Audrey was counting the blocks", educators would practice explaining the *concepts* involved in counting, for example "As Audrey counted the blocks, she demonstrated developing understandings of one-to-one correspondence, numeral names, and the stable order principle." An example of a mathematical learning story produced by a *Let's Count* educator can be seen in Fig. 6.1.

The intention of this approach was to assist early childhood educators in noticing, naming and explaining mathematical development in the early childhood years. In this way, educators attended more closely to the potential for mathematical development in children's play and investigation, and also honed their skills in communicating children's mathematical learning to others. Furthermore, the learning stories were a communication tool for discussing children's mathematical learning with families, and provided an additional medium for offering support and advice to families as to how they might explore mathematics at home with their child.

6.4 Evaluating the Impact of *Let's Count*

In 2013, after four offerings of the *Let's Count* distance education subject, I began implementing a small-scale evaluation of the program. The aim of the study was to ascertain the impact of *Let's Count* on early childhood educators and families' capacity to support young children's numeracy development prior to starting school.

Child's Name: E **Age:** 4 years old **Educator:** Stephanie	**Date**:23/4/13
EYLF Outcomes	**Learning Story: Block Play**
Outcome 1: Children have a strong sense of identity. a) Children feel safe, secure and supported b) Children develop their emerging autonomy, inter-dependence, resilience and sense of agency c) Children develop knowledgeable and confident self-identities d) Children learn to interact in relation to others with care, empathy and respect **Outcome 2: Children are connected with and contribute to their world.** a) Children develop a sense of belonging to groups and communities and an understanding of the reciprocal rights and responsibilities necessary for active civic participation b) Children respond to diversity with respect c) Children become aware of fairness d) Children become socially responsible and show respect for the environment **Outcome 3: Children have a strong sense of wellbeing.** a) Children become strong in their social, emotional and spiritual wellbeing b) Children take increasing responsibility for their own health and physical wellbeing **Outcome 4: Children are confident and involved learners.** a) Children develop dispositions for learning such as curiosity, cooperation, confidence, creativity, commitment, enthusiasm, persistence, imagination and reflexivity b) Children develop a range of skills and processes such as problem solving, inquiry, experimentation, hypothesising, researching and investigating c) Children transfer and adapt what they have learnt from one context to another d) Children resource their own learning through connecting with people, place, technologies and natural and processed materials **Outcome 5:Children are effective communicators.** a) Children interact verbally and no-verbally with others for a range of purposes b) Children engage with a range of texts and get meaning from these texts c) Children express ideas and make meaning using a range of media d) Children begin to understand how symbols and pattern systems work e) Children use information and communication technologies to access information, investigate ideas and represent their thinking	**What happened:** E was sitting alone when she had set up her blocks onto the table. Whilst there I noticed she was talking to herself whilst building. I tried to stand in closer to see what she was saying when another child joined her. During this experience E appeared to be making a little town and talking herself through the steps- "we need 1 block for the house, 1 block for the roof, we also need more houses so we will need more blocks for this." E appeared to be devising a plan before she started her work. She knew exactly what she wanted to build but when the other child came into the area and saw what she was building they started to build together. E led this play and showed great verbal direction and communication with her peer. E was able to name the blocks and give each a number she didn't go higher than 3 at a time, and her blocks were systematically lined up next to each other along the table. **Mathematical learning that took place:** E developed this play situation from her own ideas and sense of agency and autonomy (Outcome 1b). Once again she shows great understanding of persistence, enthusiasm, commitment, and imagination (Outcome 4a). E's problem solving and hypothesising skills is once again a key in her play skills and the high level of understanding she has with these two very abstract terms (Outcome 4b). She is able to count the blocks and predict which ones will make the houses. She demonstrated the concept of understanding and naming numbers and that by placing each on top of the other she identified the outcome of this process (it makes a house). E can interpret and perceive different levels within her building. E shows sound knowledge in shapes and patterns and she does this by turning a triangular block into a roof or a square block into a base for a house (Outcome 5d). E's spatial and measurement awareness when constructing the building out of the blocks shows she is experimenting with height, width, length and three dimensional equipment. **What next:** Add pictures of multi-story towns, so she can expand her awareness of shapes, patterns, and levels. This will then encourage and extend on her counting abilities, shape naming and recognition skills. E's parents could take her to the city to see some high rise buildings or show her pictures on their computer or in magazines to encourage her imagination.

Fig. 6.1 Example of a mathematical learning story

6.4.1 Evaluation Design

All past *Let's Count* participants were invited to participate in an email interview, or "EView" (Fenton 2012), about their experiences, reflecting upon their initial engagement with *Let's Count* and how this has impacted their current beliefs and practices. Educators who agreed to participate were then asked to extend an invitation to participate in the research to any parents with whom they have worked as part of their *Let's Count* activities, both former and current. Parents who wished to be involved also participated in an EView about their experiences with *Let's Count*. Participants were also invited to share examples related to *Let's Count* activities, if they felt comfortable in doing so. For educators, these examples included documentation of mentoring approaches such as presentations, newsletters, curriculum planning documents, or learning stories; while parents shared examples of numeracy explorations they have undertaken at home, and ways in which they have communicated with educators about their child's numeracy development.

6.4.1.1 EViews

Email interviews, or 'EViews', is an approach developed by Fenton (2012) as a means of undertaking interviews via email communications. The EView approach was chosen as it was in keeping with the online approach taken during the delivery of the *Let's Count* professional learning program; hence, it could be reasonably assumed that participants felt a degree of comfort in operating in this online mode.

The EViews were semi-structured; participants were provided with an initial interview schedule to read and respond to, but were encouraged to respond only to those questions with which they felt comfortable. Additionally, participants were encouraged to add additional comments and foci if they wished, as well as respond in alternate ways (such as the sharing of anecdotes and photographs). Because of the flexible nature of the EViews, communication with participants has been ongoing, with no fixed endpoint to the conversations. The sustained nature of these EViews is testament to the relationships which have been developed through engagement with *Let's Count*.

6.4.1.2 Participants

In this chapter, I report on the EView data from the educator participants in the evaluation study. Eighteen early childhood educators participated in the evaluation study. The average age of the educators was 36 years, and the participants were all female—reflective of the demographics of early childhood educators in Australia. Indeed, only a very small number of male educators have participated in *Let's Count* more broadly. Participants in the evaluation study were drawn from communities across Australia (though, predominately New South Wales and Victoria), as well as internationally—specifically, Brunei Darussalam and the United Arab Emirates—

as a result of the participation of international students in the degree program housing the *Let's Count* subject.

6.4.1.3 Data Analysis

Analysis of the EView data was informed by grounded theory approaches (Strauss and Corbin 1990). Open-reading of the EView transcripts was undertaken before coding of the data in order to identify emergent themes, with verbatim excerpts from the data chosen to exemplify these themes. These themes and excerpts are reflected in the presentation of data which follows.

6.5 Insights from the *Let's Count* Evaluation

6.5.1 Noticing Mathematics in the Prior-to-School Years

As noted in the work of Cohrssen et al. (2013), early childhood educators' understanding of, and confidence with, mathematics is a significant issue in early childhood education. This is a point that was reflected in the educator data, with several participants commenting on the fact that prior to their participation in *Let's Count* they struggled with mathematics, both personally and professionally. However, through their engagement with the program, these educators reported increased confidence with, and understanding of, mathematics, as the following comments illustrate:

> How I feel about mathematics has absolutely changed…. I feel confident as an early childhood educator in being able to teach mathematics to the children in my care [Annette, VIC].

> The priceless knowledge that I have learned from this is the way I 'see' maths now. I couldn't seem to understand maths when I was young, even when I first started to teach, but now I am proud to say I have gained a massive understanding in maths [Apple, Brunei Darussalam].

This changed perception of mathematics has meant that these educators are now more attuned to the mathematics in everyday life and, importantly, are noticing the opportunities for mathematical exploration in the prior-to-school settings in which they work. Educators have reported noticing opportunities for mathematical learning—for both themselves, and for the children with whom they work—as the following quotes demonstrate:

> I am now more interested in seeking the mathematics in life for myself. I see maths as something that can be approached and tackled rather than avoided [Sarah, NSW].

> I'm not confident with maths but after undertaking the course I felt I benefitted as well as the children. It gave me the confidence to implement more 'maths' type activities and to talk confidently about maths [Stephanie, VIC].

> I actually silently mention to myself at certain times, "That was maths you just used. See, you did need it when you grew up" [Carissa, NSW].

In addition, educators have reported that a significant impact of *Let's Count* is that they now are 'seeing' the maths in young children's activity, which had previously gone unnoticed. As the following quotes demonstrate, educators perceive there to be a direct relationship between their increased knowledge of mathematics and their ability to recognise mathematics in children's everyday activity:

> I've learned so much from this subject and it deepened my knowledge in maths. I can understand maths better through children's play and I discovered that I can 'see' mathematics all around me every day [Apple, Brunei Darussalam].

> I never used to acknowledge the children's learning styles and how they used these to engage with mathematics in play. I see more maths learning in the children than I have ever seen before [Carissa, NSW].

> I learned that maths is all around us, and that armed with knowledge we can more clearly see children's maths play [Sarah, NSW].

Importantly, this new ability to notice the mathematics in everyday activity has been reported by educators to have had an impact on their practice in early childhood education settings. As the following quotes illustrate, educators are now attending to the use of mathematical language, and noticing and naming mathematical concepts:

> Mathematical language is being used more by the educators—what was a sensory activity of pouring rice has turned into a mathematical activity identifying mathematical concepts such as full and empty, weight and quantity [Annette, VIC].

> The way I talk to the children has changed, using more appropriate vocabulary and actions to scaffold their abilities and knowledge [Carissa, NSW].

> A change that I made which stemmed from this project was pushing more for children to find their own answers to questions or questioning them from a different perspective to what I normally would have [Jody, NSW].

Furthermore, educators are now recognising 'mathematics' as being more than just number recognition and counting, and have begun to incorporate a wider range of concepts and processes in the mathematical experiences they provide for children:

> As my confidence grew the children's opportunity to take part in maths grew. I would always have counting and problem solving activities, but now I can use more types of experiences to give the children the opportunity to participate with maths. I can see experiences differently now, therefore able to pass these on to the children [Stephanie, VIC].

> Many of the other educators in my service stick to plain counting and number games, whereas I now use nature, the environment and the children themselves to collect, gather, count, classify and hypothesise to extend their mathematical knowledge [Melanie, VIC].

Let's Count has also provided educators with 'reinforcement' of the importance of mathematics education in early childhood, and completion of the program has

equipped them with the confidence and strategies to bring about change in their workplaces:

> One of the highlights was the opportunity to show the educators the *Let's Count* project to prove to them I do know what I am teaching about (often childcare whispers and historical teaching beliefs cause doubt and reluctance to change)…. I believe *Let's Count* has supported me to support other educators at the service to incorporate mathematical concepts through everyday practice in informal and formal teaching opportunities [Valerie, NSW].

The changes made to their mathematics education practices as a result of *Let's Count* have, importantly, been reported by educators to have had a positive impact on children's interest in, and engagement with, mathematics in both their early childhood education settings and home environments:

> Before *Let's Count*, the children only participated in maths activities when they were asked to, but now they have built interest in maths and we need to extend their skills in deeper maths concepts such as counting, sorting, classifying, etc…. One of the children said, 'I can do measuring'. He successfully counted the number of cups needed to make play dough. After the family gathering, his parents were so proud of him. He helped his mum bake a cake at home and he could measure the ingredients needed to make the cake. The parents and I still keep in touch [Apple, Brunei Darussalam].

> The children are more interested in learning about maths now so instead of me doing structured maths activities we are doing maths all the time … the children have created their own positive dispositions for learning maths [Carissa, NSW].

> A highlight was the conversations with the child, and the child's insightful comments revealing her apparently innate interest in numbers and 'mathematising' in order to make sense of her world—fascinating! [Sarah, NSW].

6.5.2 Supporting Parents to Explore Mathematics at Home

A key function of *Let's Count* is to develop early childhood educators' skills in supporting the parents of children in their service to explore mathematics with their children at home. There are many contexts for learning about mathematics, and one of the most meaningful learning contexts is children's homes (MacDonald 2012). Indeed, engagement with mathematics outside of school may have a profound impact on the knowledge that children bring to the classroom (Guberman 2004). In reflecting upon their engagement with the *Let's Count* program, educators talked about how the program helped them to develop their ability to act as mentors to parents and support the exploration of mathematics in home environments:

> I was aware that there wasn't much going, not through not trying, however through not knowing how to introduce mathematics to their children. This was why I decided to use all house hold items and daily activities to show families just how easy it is to incorporate mathematics into everyday routines [Annette, VIC].

> I enjoyed doing the learning stories, in particular giving advice to the parents on how they can extend on mathematics learning at home…. I encourage parents to be more hands on in their child's learning and recognise that they are the number one teachers of their child and

> they may be missing out on important opportunities because they think counting 1–10 is what we will teach them and is the only maths they need to learn [Carissa, NSW].

Several educators in the study talked about *Let's Count* as highlighting the importance of the mathematical learning opportunities provided by parents, and how the program has reinforced the role of parents as children's first teachers of mathematics. In many cases, it was reported that *Let's Count* assisted parents actually recognising themselves as teachers of their children; indeed, for some parents, *Let's Count* was a revelation as to the important role they play in their child's mathematics education. Educators who participated in this study reported increases in parents' confidence with this role, as well as a new appreciation for the mathematical activity they were already doing with their children—often without realising it:

> I loved the fact that parents actually realised that they were doing these great things with children already but didn't actually know it or understand the benefits of it. I also loved the fact that parents were into it just as much as the children…. Parents also said they would continue on or, more to the point, be more aware of how mathematical concepts could be introduced in so many ways for children [Jody, NSW].

> One of the highlights was hearing a parent say "Thank you, I'm doing that but it's just nice to realise I'm doing the right thing" [Stephanie, VIC].

6.5.3 Fostering Partnerships between Educators and Families

As described in the EYLF (DEEWR 2009, p. 12), "learning outcomes are most likely to be achieved when early childhood educators work in partnership with families", and it is on this basis that *Let's Count* was formed. Indeed, the process of fostering relationships/partnerships between educators and families features strongly among the reflections of *Let's Count* educators. In particular, educators commented on how the sense of partnership between themselves and the families created different understandings of each others' roles, and fostered mutual knowledge and appreciation of each other:

> The parents that attended the night got to see me as an educator, not a manager, which has created a different level of understanding and respect we both now have for each other [Annette, VIC].

> I got to know the child better through the family gathering. Parents enjoyed the gathering and asked for the next gathering! I've learned a lot from parents and shared strategies and give positive advice on what and how they can introduce maths at home too [Apple, Brunei Darussalam].

> Through working on such projects with children and families as equal partners we are enabled to share and celebrate children's learning. The family I worked with were clearly proud of the child's numeracy understanding and thinking. The child was seen as competent by all and her family expressed an intention to further extend on her numeracy learning in their everyday lives [Sarah, NSW].

Key to the success of the relationships built during *Let's Count* was parents being acknowledged as the children's first, and most important, teachers. Educators

reported that this acknowledgement—and the communication of this to families—changed the dynamic of their relationships with parents, with both parties being seen as of importance in children's mathematics education:

> Although we had positive relationships with families, *Let's Count* has promoted the discussion about learning and teaching from our educator perspective and the role of families in working in partnership together and has encouraged confidence in parents in their role as the child's most influential teacher [Valerie, NSW].

> The discussions which have taken place with the parents at my centre involved in this project have built our relationships immensely. It has provided or stimulated many more conversations that probably have come more from their end on how well they are 'teaching their child'. I mean this by the fact that of course parents are the child's first teacher, however, they often send them to preschool to learn and develop and it was like 'look what we have done'. It was my turn to say how wonderful they are working with their children and hear excitement in their voices telling you about the children's 'homework', which is what the parents called it [Jody, NSW].

6.5.4 Promoting Positive Transitions to School Mathematics

Educators who participated in *Let's Count* have expressed their belief that the program has helped to promote positive transitions to school mathematics, for both the children and also for the parents. In particular, educators cited increased parental confidence and familiarity with the mathematics in everyday life as being beneficial as their children start primary school:

> The gathering helps parents to better understand how they can include maths at home as well as in school [Apple, Brunei Darussalam].

> I think our conversations may have increased the parents' confidence in their child's mathematics abilities, in the months before starting school [Sarah, NSW].

> I think some of the parents will now be a bit more comfortable when they have to teach their child school mathematics [Vicki, NSW].

Educators also felt that it was beneficial for the children to be starting primary school with a positive disposition towards mathematics and a sense of how they use it in their everyday life. Educators expressed their enjoyment in helping to promote this interest and understanding in the children with whom they have worked, and felt that this would be of assistance in their transition to school:

> I enjoyed seeing children develop, and be able to move forward through their school life with an understanding of maths [Apple, Brunei Darussalam].

> Mathematical concepts have really been a major part of our school readiness program this year and more so than in previous years due to the fact that I have completed this program…. I do believe personally that these children have had such a positive start to mathematics that [school mathematics] will certainly be a positive experience for them all [Jody, NSW].

Finally, educators again emphasised the importance of relationships between families and educators, particularly as child transition to primary school, expressing a belief that these relationships will assist children's learning and development as they encounter school mathematics:

> I think *Let's Count* helped to promote parents' understanding of how important and valuable their role is in the education of their child. It also promotes how effective relationships with their child's educator can assist their child's learning and development [Valerie, NSW].

6.5.5 Sustaining Let's Count *Initiatives*

Testament to the success of the *Let's Count* program was the educators talking at length about their intentions for sustaining their *Let's Count* initiatives. As discussed earlier in the chapter, *Let's Count* has had a significant impact on the mathematics education practices of these early childhood educators, and the data from the EViews suggests that educators see benefits in sustaining—and further developing—these new practices:

> I intend to regularly revisit the *Let's Count* learning resources to help me remember the many facets of mathematics that are observable and extendable in children's work and play. I have made myself a little revision document summarising some of the mathematical concepts, processes and ideas. I also intend to create some posters with examples of children playing with maths to inspire myself and others to continue seeking and providing for mathematics learning [Sarah, NSW].

> We continue to take every opportunity to promote relationships with families that encourage family input about children's learning at home that can be extended in the service then flow back and forth. We continue to make learning visible to families and children to promote further learning and celebrate children's achievements [Valerie, NSW].

> I am going to implement something similar with my next group of school readiness parents. I will on this occasion involve all the parents within this group of children and use the information I am given back from the parents to put into the children's portfolios…. I may need to tweak it each year but do what works best for the parents at the centre. The first thing needed is to be able to communicate with them about the importance of mathematics for these children [Jody, NSW].

Parents, too, have shown interest in sustaining the activities they have undertaken as part of *Let's Count*, and some of the educators involved in the study have reported that parents have maintained their communication about their children's mathematics:

> I know some of the families are still continuing with the *Let's Count* activities in their home environments. I often have emails and phone calls from parents asking for suggestions of different activities and receive photos and videos of them participating [Melanie, VIC].

It would seem that a strength of *Let's Count* has been its flexibility and adaptability, and its ability to influence practices beyond the scope of the initial program offering. Indeed, the data from the evaluation would suggest that *Let's Count* has been merely a 'springboard', and that educators and families have taken ownership of

the ideas inherent in the program and adapted these to suit their own contexts and purposes. This is key to sustaining the effects reported in this study.

6.6 Implications of *Let's Count* for Mathematics and Transitions to School

Interviews with *Let's Count* educators have shown that the program has provided many opportunities for children, families and early childhood educators to explore mathematics in the years before school. The approach of the program has promoted partnerships between families and educators to support young children's mathematical development. The program has highlighted the importance of noticing, naming and celebrating the mathematical understandings which young children develop prior to starting school, and data from the interviews would suggest that the program has resulted in mathematics being given greater attention and higher priority than it may otherwise have received. Making mathematics a priority in early childhood education is critical because, as Cohrssen et al. (2013, p. 95) argue, "Children who have not mastered foundational mathematical ideas prior to commencing formal education may be disadvantaged as they start school (Chien et al. 2010; Mazzocco and Thompson 2005; van de Heuvel-Panhuizen and van den Boogaard 2009), and the gap may never be closed (Entwisle and Alexander 1990)".

The evaluation of *Let's Count* has highlighted several key imperatives for mathematics education in the years prior to starting primary school. These imperatives include:

- Making mathematics visible in the years before school;
- Celebrating the mathematical experiences of children before school;
- Children, parents and educators noticing, naming and talking about mathematics before school;
- Educators developing strategies for communicating about children's mathematics—both with families, and also for the purpose of inter-setting communication (i.e. between service and school) at the time of transition to school;
- Empowering parents to engage with their child's mathematics education; and
- Raising parents' and early childhood educators' awareness of their important role in children's mathematics education, and the impact of this early engagement with mathematics on later outcomes.

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