Chapter 14
Fostering Children's Everyday Mathematical Knowledge Through Caregiver Participation in Supported Playgroups in Schools

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Abstract In this chapter we discuss supported playgroups in schools (SPinS) as sites for engaging families as the first mathematics educators of young children. We refer to findings from our work to show how caregiver (e.g. parents, grandparents, aunts) participation in SPinS can contribute to an awareness of children's learning of mathematical concepts through play. We discuss the findings from our work in relation to 'everyday mathematics' and make several recommendations aimed at enabling families to engage in everyday mathematics both at SPinS and in the home.

Keywords Supported playgroups · Play · Mathematics in the home · Early childhood

Introduction

Mathematical knowledge for young children is a known predictor of success in later mathematics learning at school (Tudge and Doucet 2008). Research suggests that young children's engagement with mathematical concepts in the home is critical to their later concept formation upon reaching formal education (Skwarchuk 2009). In this chapter we use Ginsburg et al. (2008) concept of everyday mathematics as informed by Vygotsky's ideas about conceptual learning to think about young children's mathematical learning in the home. In particular, we draw on research suggesting that children's participation in play-activities in the home is an important conduit for accessing everyday mathematical concepts. We then reflect on how caregivers (e.g. parents, grandparents, aunts) can be best supported to provide

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children with access to increased opportunities for play in the home by reporting findings from a project we have conducted regarding caregiver participation in supported playgroups.

The supported playgroups we report on in this chapter were co-located on local primary school sites, and are known as Supported Playgroups in Schools (SPinS). Each SPinS was operated by a playgroup co-ordinator in cooperation with two pre-service early childhood educators from a local university. The playgroup coordinator and pre-service early childhood educators designed and implemented play-activities for the children guided by the Learning Outcomes from the Australian Early Years Learning Framework (EYLF) (DEEWR 2009). The EYLF is a curriculum framework used to guide the provision of curriculum for young children aged birth to 5 years in Australian early childhood education settings. These settings include formal kindergarten, long-day care and family-day care. Caregivers indicated that participating in SPinS increased their understanding of how to involve children in play both at SPinS and in the home. We outline recommendations for policy and practice in terms of supporting caregivers and children in the engagement of play-activities intended to increase children's access to everyday mathematical concepts.

Theoretical Framework: From Everyday to Mature Concepts

'Everyday mathematics' is the term Ginsburg et al. (2008) gives to the mathematical engagement of young children in the family home (see also, Ginsburg and Amit 2008). Ginsburg et al. (2008) suggest that everyday mathematical learning is more focused on the mathematical thinking afforded by the objects and events experienced by children in their homes than it is on the explicit learning of mathematics itself. Everyday mathematics is important for young children because it exposes them to the use and purpose of mathematics across a range of areas, including number, geometry and patterning in the context of their daily lives and experiences (Wager and Parks 2014). For example, a 3-year-old boy is taught by an older sibling how to create a pattern for a paper chain they are making to decorate their newly arrived Christmas tree. When the 3-year-old places two orange coloured loops in a row, his older sibling gently explains: "No we are making a pattern. Look you have to go 'blue, orange, blue, orange, blue, orange'. Do you see? You can't put 'orange, orange' that is not the pattern." In another example, a 4-year-old child is invited to set the table for an evening meal and upon being told that five people are eating counts out five sets of implements and correctly places these on the table. In yet another example, a 4 year girl is making birthday cakes in the sandpit. Knowing that she is four and turning five in the coming year she begins to place candles in the cake using pegs to represent the candles. She picks up on peg from

the ground and inserts it into the cake. 'One candle' she says. 'I am turning five, so I need four more'. She then counts out four additional pegs as her candles from the nearby peg basket. Other examples involve children assisting with shopping (e.g. counting out eight apples) and helping with directions ('which way do we turn to get to kindergarten?'). Research shows that young children's exposure to everyday mathematics in the home predicts their later levels of mathematical learning (Anders et al. 2012). In particular, the quality of the 'home learning environment' (Melhuish et al. 2008) in provisioning everyday mathematics for young children is considered important. For pre-school aged children this involves interactions with family members that include games and play-activities involving mathematics, such as singing nursery rhymes, playing with blocks and/or Lego, using puzzles, participating in craft, painting and drawing, and sharing books and digital resources that involve counting, shapes and patterning (Sylva et al. 2004). In recent years apps for young children associated with mathematical knowledge have also become an increasingly important home learning activity. These include open-ended apps that encourage children's own mathematical activity (such as drawing, painting) and more structured apps that focus on shape recognition, number and counting (Yelland et al. 2014).

Ginsburg's ideas about everyday mathematics draw explicitly on the work of Vygotsky (1987). Vygotsky argued that everyday concepts are foundational for young children's acquisition of mature concepts. Mature concepts are achieved by children when they are able to blend an everyday concept with what he called a scientific concept. A scientific concept is an accepted knowledge convention, such as a number operation indicated by knowing that two plus three equals five. A child may know this operation at an everyday level as having two chocolates and then asking for three more (or in the case of the birthday candles, one plus four equals five). The child achieves a mature concept of this operation when she also realises that her two chocolates and her next three chocolates may be represented as $2 + 3 = 5$. Here, the everyday blends with the scientific to provide the child with a useable or 'mature' concept for explaining why two chocolates plus three more chocolates provides a total of five. Research shows that everyday concepts are significant for young children's early learning because they set the basis for later connections with scientific concepts upon reaching formal early childhood education settings (Fleer 2011). Research also suggests that everyday mathematical concepts experienced by children are a significant predictor of later mathematical learning (Skwarchuk 2009). Everyday concepts are described as embedded in young children's play, including their 'informal' play such as a pretend play, or more formal play, such as engaging in games or singing songs with adults. Due to the relationship between children's play and their engagement with everyday concepts, play in the home has been promoted in recent years as significant for young children's learning.

Play in the Home

Young children's engagement in play in the family home is increasingly acknowledged as important for their learning. Ginsburg's adaptation of Vygotsky's ideas about concept formation into the idea of 'everyday mathematics' highlights how play is understood to prime children conceptually for later learning. Internationally, 'play in the home' has been harnessed as a means of mediating against social and economic disadvantage (e.g. Desforges 2003). This is because research suggests that children benefit educationally from informal and formal play experienced in the home. Increasing levels of play in the home to mediate against social and economic disadvantage has been achieved primarily through parenting interventions designed to help parents increase the range of play-activities they provide for their children in the home. Well-known approaches include HIPPY and the ABCEDARIAN approach in which parents are provided with sample play-activities they can provide to their children, and are likewise encouraged to focus on the explicit engagement in play with their children for at least 15 minutes per day. Longitudinal research shows that these approaches significantly improve young children's learning outcomes in areas such as literacy and mathematics (Baker et al. 1998; Campbell et al. 2012). Other approaches have focused on making play-activities in the community more accessible to parents. These approaches frequently involve early childhood professionals modelling the use of play-activities to parents in informal settings so as to increase parental awareness about the provision of everyday concepts to children through play. One such approach, from the United Kingdom known as 'Room to Play' was a playroom set up in a local shopping centre (Evangelou et al. 2006). Parents were able to 'drop in' to the playroom with their children at any time and their children invited to participate in play-activities designed by staff. This approach was shown to increase parental interest in children's play at home, and importantly moved away from the notion of parenting interventions designed for 'hard-to-reach' families towards a more a philosophical and practical commitment to realising more accessible services for families instead (Evangelou et al. 2013). In our own research, we have been considering the role of playgroups in creating accessible opportunities for parents to learn about their children's play as a basis for play provision in the home and increasing young children's engagement with everyday concepts prior to participation in formalised early childhood education services.

What are Playgroups?

Playgroups are groups where parents and children gather regularly with their children to participate in shared play-activities. In Australia, families generally access one of two types of playgroups. The first type is known as community playgroup. Community playgroups are typically run by attending parents on a

voluntary basis. Parents and children meet in a community facility or family home for approximately two hours per week. During this time, parents provide the participating children with a range of play-activities and support their own and their children's social interactions with others. Community playgroups are attended by families from across the socioeconomic spectrum, although the quality of play-activities offered to children during these sessions is highly variable as it depends on parental knowledge about play and access to resources for play-activities. Supported playgroups are playgroups run by a nominated and paid playgroup coordinator. Generally, supported playgroups are attached to a community services provider and specifically target families considered 'vulnerable' due to factors such as a socioeconomic disadvantage, drug or alcohol use, refugee status or speaking a first language other than English (Jackson 2011). In supported playgroups the play-activities are planned and implemented by the playgroup coordinator. The playgroup coordinator also models play-based interactions with children designed to increase children's exposure to everyday concepts, in areas such as mathematics and literacy learning.

Data from the Longitudinal Study of Australian Children (Hancock et al. 2012) suggests that children who attend community playgroups during their infant and toddler years show increased learning gains in the area of literacy and mathematics than those who do not attend. Research also shows that parental participation in supported playgroups reduces social isolation and increases parents' capacity to engage with their children in play-based activities (Jackson 2013). Playgroups are well established as a sites for parental and child engagement and participation in play. For this reason, community and supported playgroups are increasingly provided on-site by primary schools as a means of broadening community access to play-based learning activities and experiences for children and families. In our own research, we have considered parental perspectives on their participation in supported playgroups located on school sites. This form of playgroup provision is called Supported Playgroups in Schools (SPinS) (McLean et al. 2014).

The SPinS Project

The project on which we report in this chapter involved the provision of SPinS to families in an area of identified socio and economic disadvantage according to Australian Early Development Index (AEDI) and Best Start Atlas data. Five SPinS were co-located on five separate primary school sites. A playgroup coordinator attended each of the SPinS and was supported in the provision of play-activities to the children and families by two pre-service early childhood educators from a local University. The playgroup coordinator and pre-service educators cooperated in the planning and implementation of play-activities for the children and families. The planning and implementation of play-activities was informed by the Learning Outcomes associated with the Australian EYLF (DEEWR 2009). The intention of the SPinS project was to build community connectedness to local schools and to

increase the access local children and families had to opportunities for play-based learning prior to moving into formal early childhood education and school based services. For the purpose of this chapter, we report on caregiver perspectives about their participation in the SPinS—paying particular attention to their views regarding the play-activities provided in the playgroup and the extent to which participation in the playgroup influenced the play-activities they provided their children at home. We are interested in caregiver perspectives on the experiences provided in SPinS and whether these influenced the provision of play in the home because of the theoretical and empirical significance placed on children's access to everyday concepts (e.g. everyday mathematics) in the home through play-based activity as a basis for children's later successful mathematical learning.

The SPinS operated over the course of two normal school years. Participants in the SPinS included parents, grandparents and aunts of young children aged from infancy to 4 years. We called the participants 'caregivers' in recognition that not all of the participants were the parents of the attending child. All caregivers were invited to contribute to a pre and post participation focus group interview regarding their participation in SPinS in the first and second year of the project. Of the 50 caregiver participants across all five SPinS, eleven agreed to contribute to the focus group interviews. The focus group interviews employed a semi-structured interview schedule (Krueger 2009) and focused on caregivers' views about the play-activities provided for their children within the SPinS, and the extent to which they perceived their participation in the SPinS as influencing the play-activities they provided their children in the family home. All interviews were audio-recorded, and later transcribed by a professional transcription company. Interview transcripts were inductively analysed by two researchers and checked for coding consistency by a third researcher (Grbich 2013).

Lessons from SPinS: What Do Caregivers Think About SPinS Play-Activities and Children's Play in the Home?

Caregiver views about the play-activities provided for their children within the SPinS suggested value in SPinS as a context for caregiver learning about children's play and the consequent provision of play-activities to children in the home. Caregivers commented on the structured nature of play-activities in the SPinS as provided by the coordinator and the pre-service educators, and the extent to which their participation in SPinS exposed them to play-activities they had not previously considered for their children. Some of these activities were consequently employed by the caregivers in the home, thus increasing the children's access to informal and formal play-activities both in the SpinS and in the family home.

Caregivers commented on the routine informing the conduct of the SPinS and the presentation of play-activities to children so as to maximise play and reduce the level of random activity occurring amongst the children. For example, one

caregiver described how the playgroup routine meant that she and her child knew what was going to happen—when they would play, engage in craft activities, have a snack and then participate in shared reading and singing with the rest of the group. This was valued because it meant that the caregiver and child could anticipate what would happen next and so fostered the caregiver's capacity to engage with her child:

> The set-up is good. There's sort of a process. We [parent and child] know that we play and eat and do craft. Then it's pack up, and then it's ok for fruit time. Then that's packed up and it's book [pre-service teachers reading stories to the group] so they start to get to know that it is book and song time. So they [children] know the routine. I think that's really important for kids, routine. (Kate)

Here the caregiver notes value in the routine for herself and her child. Routine is considered 'really important for kids'. From an everyday mathematical perspective, this aspect of SPinS also provides the child with access to concepts associated with time and chronology and so helps the child learn that activities can be sequentially based in terms of 'what comes next'. Other caregivers commented on how the play-activities were presented to the children. They discussed how the pre-service early childhood educators distinguished between play-activities by using blankets to create stations. These blanket stations resulted in more focussed play by the children and reduced the extent to which toys were scattered around the room:

> The girls [pre-service early childhood educators] put down a blanket and there might be baby toys there, blocks there [caregiver pointing to areas around the room] and puppets over there … it's a really clever way of getting the children involved, rather than [having the] toys all over the room. (Tara)

> I noticed that they are sorted into little sections; it focuses their [children's] play. It's a clever way of doing it. Previously it was just a bit random. The children tipped out the toys from the boxes, move to the next box and tip that one out and not play. It's a great improvement to playgroup, putting down those blanket stations. (Candy)

For these caregivers being exposed to the presentation of the play-activities in the form of 'stations' alerted them to how the children's play could become more focused. This was important because it helped the caregivers see that they could focus their children's play without necessarily needing to direct this in a verbal way. Once again, the structuring and presentation of the play-activities also exposed the children to everyday mathematics in terms of categorisation with 'baby toys there, blocks there and puppets over there'. In these examples, the caregivers are learning from the coordinator and pre-service early childhood teachers about structuring routines for children and how to present play-activities for maximum play benefit, while the children are participating in a series of experiences that increases their exposure to everyday mathematics (e.g. time, sequencing and categorisation). This exposure is in addition to the play-based activities children also experienced that are likely to promote their engagement with everyday mathematical concepts such as shape and size through puzzles and block play and number through opportunities for dramatic play (e.g. 'cooking' six pancakes).

Caregivers also reflected on how the play-activities they saw implemented in the SPinS promoted the provision of additional activities in the family home. For some caregivers this was focussed on easily transferable activities, such as the increased singing of rhymes and the conduct of dances learned at SPinS in the home:

> My daughter she is into art a lot, so she loves to paint…and all of my kids they like to draw and do puzzles. I help here. I know she'll hear dances and stuff that she's heard at playgroup and she'll do at home that we haven't done with her before, so she'll pick them up. (Nancy)

> I have [engaged in singing and dancing at home] it's a lot of singing and dancing because the children are all sort of three and under. Ring-a-ring-a-rosy is very big at the moment because they all do it together and they can do it all by themselves together. We've added the second verse [at home] 'the cows in the meadow and then all jump up'. A lot of songs, 'Big Mack Truck' is a good one because of the actions, the children can get involved with the actions and 'Galoop Went the Little Green Frog' is also a very popular one because they can do the 'la-di-da-di-da' [caregiver demonstrates action with hands]. (Deb)

In these examples, the caregivers described their children engaging in activities that they learned at SPinS and had not previously enacted in the home. Singing nursery rhymes is particularly associated with literacy learning (Goswami 2003), and also benefits children's engagement with everyday mathematical concepts where the rhymes include appropriate concepts (e.g. 'up' and 'down' in *Ring-a-ring-a-rosy*; 'little' and 'big' in *Big Mack Truck*; number in *One, two, three, four, five, once I caught a fish alive*) (Aubrey et al. 2003). Other caregivers indicated higher levels of transfer of SPinS play-activities to the home. One caregiver noted how the pre-service educators used natural materials to support the children's play and then sourced her own materials to help the children participate in some craft activities in the home. Craft activities promote opportunities for exploring shape (e.g. how to cut triangles from square paper) and number (e.g. counting and using different craft pieces). Another caregiver particularly valued a session that focused on learning soccer skills and how these skills were practised and shared in the home by the children. Sharing the soccer skills in the home interested the child's father in the SPinS and he consequently expressed interest in attending the next SPinS session:

> A lot of the stuff [things made at SPinS] we take home and then that gives me foundation to move on from. The students [pre-service early childhood educators] would do natural things, it then gave us the opportunity to go back to my house and we'd collect more natural things, find other things to do with those natural resources, just things like that, we could follow on from that original idea. We made teddy bear masks, so we were able to then go back to my place and have teddy bear picnics with our teddy bear masks. (Deb)

> The soccer program was great. You took a ball home and showed what you learned today. You learnt bouncing, kicking and skills like that. It made the children stop and talk about what we did [at SPinS]. Dad was interested and wanted to attend next week. (Tamara)

In these examples the caregivers describe how they transferred play-activities experienced at SPinS into the home for their children. Mathematically, making teddy bear masks for each bear supports one to one correspondence, and playing soccer provides opportunities for counting goals scored. Here the emphasis was on

what caregivers were doing with their children in the SPinS context rather than on being directly 'taught' about the value of play and play in the home for their children as is the case in some parenting intervention approaches such as Abecedarian or HIPPY (Baker et al. 1999; Campbell et al. 2002). This is significant for promoting young children's mathematical learning in the early years because these caregivers were learning about children's play through their participation in SPinS, rather than being directed to increase the range and level of play-activities they provide for children in the home per se (see for example, Evangelou and Wild 2014). Instead, the focus on the children's play established by the playgroup coordinator and pre-service educators helped the caregivers to understand how they might provide similar; or even extension-based activities in the home (e.g. making teddy bear masks). One caregiver described SPinS as different from other groups because the focus was not just on parental interaction, but on the children and their play. Another noted how play-activities experienced in SPinS could be repeated at home:

> It's more focused on the children rather than the parent interaction as in a normal mothers' group. It's more focused on the child, it's a kid-focused group. (Deb)

> The kids love to build the high towers and stuff like that and we have the same [blocks] at home, like playgroup, where we have the blocks where we build castles and towers and stuff like that. We often sit down and read a book together … or we'll get on the computer and we'll play some songs and some nursery rhymes on the computer. (Mary)

These suggestions indicate that caregiver participation in SPinS has the potential to increase the range and type of play-activities children experience in the home. This is important for children's early mathematical learning because increased participation in play-activities in the home is likely to increase children's exposure to everyday mathematical concepts. This is particularly the case for the caregiver who described building with blocks at both SPinS and in the home. Here the caregiver also described playing songs and rhymes on the computer and reading books with her child—all activities associated with increased mathematical learning for young children. In the words, of one caregiver: 'playgroup [SPinS] offers different sorts of crafting, like building the horses today, something like that we've never done at home. So just things like that, always getting new ideas I think, which is good' (Marley). Increasing children's access to play-activities in the home as a basis for engaging with everyday mathematical concepts may therefore be considered achievable through appropriately engaging parents and caregivers in learning about how to provide play opportunities for their children. In terms of the SPinS project, caregiver 'engagement' was fostered through the play-activities designed and implemented by the playgroup coordinator and pre-service educators which had the benefit of helping parents to understand how to structure children's participation in play and the later provision of play-activities in the home through repeating SPinS activities, or providing 'new ideas' that they could implement themselves.

Recommendations for Policy and Practice

Our experience researching the SPinS confirms that increased caregiver engagement in young children's play in the home is possible. This may be achieved by providing caregivers with access to a play-based context that models how to implement and structure play-activities for young children. Supported playgroups in particular may be ideally suited to this process because they are not a formal provider of early childhood education for young children, and yet, benefit from the professional expertise of a playgroup coordinator who can design and implement play-activities that children and caregivers experience together (McArthur et al. 2010). Recommendations for policy are that parenting engagement initiatives focus on the *context* of play provision for children and families rather than only the delivery of information about the benefits of play for young children. This is because context enables caregivers to see the provision of play-activities in action, rather than focusing on telling caregivers how important play-activities are in promoting children's access to everyday mathematical concepts. Focusing on context helps to increase the likelihood that children will experience a range of everyday mathematical concepts. Learning Outcome Five 'Children are effective communicators' from the EYLF suggests that it is "essential that the mathematical ideas with which young children interact are relevant and meaningful in the context of their current lives" (DEEWR 2009, p. 38).

In terms of young children's mathematical knowledge, recommendations for practice include the provision of play-activities in supported playgroup situations such as SPinS with a strong focus on everyday mathematic concepts, such as a space, number and geometry through the continued use of puzzles, songs, nursery rhymes and block play (see for example, EYLF Outcome Five: 'Children begin to understand how symbols and pattern systems work', DEEWR 2009, p. 38).This may also include the use of appropriate apps on tablet technologies that connect with more traditional forms of play (e.g. open-ended applications involving children in building with blocks, problem solving and/or drawing). In addition, supported playgroups may be able to capitalise on the structure and provision of play-activities to children as a basis for engaging everyday mathematical knowledge with young children, such as through playgroup routines and the presentation of categorised play-activities (see for example, EYLF Outcome Five: 'Children begin to notice and predict the patterns of regular routines and the passing of time' DEEWR 2009, p. 42).

Conclusion

Young children's mathematical knowledge is an important predictor of their later mathematical success in formal education. Young children's engagement with everyday mathematical concepts in the home provides an important basis for later

mathematical learning through the achievement of mature concepts. Children's play in the home is an acknowledged influence on their access to everyday mathematical concepts. Our research suggests that a core aspect of increasing young children's access to play-activities in the home lies in supporting caregivers to understand how to provision children's play and to articulate this to the family home. SPinS appears to be a useful mechanism for engaging caregivers in children's play as it provides a *context* in which families are exposed to planned and structured play-activities for children by a playgroup co-ordinator on a local school site. As caregivers become familiar with the use of play-activities in SPinS they may be influenced in their role as young children's first mathematics educators, in the provision of play-activities to children in the home.

References

Anders, Y., Rossbach, H., Weinhart, S., Ebert, S., Kuger, S., Lehrl, S., et al. (2012). Home and preschool learning environments and their relations to the development of early numeracy skills. *Early Childhood Research Quarterly, 27*(2), 231–244.

Aubrey, C., Bottle, G., & Godfrey, R. (2003). Early mathematics in the home and out-of-home contexts. *International Journal of Early Years Education, 11*, 91–103.

Baker, A., Piotrkowski, C., & Brooks-Gunn, J. (1998). The effects of the home instruction program for preschool youngsters (HIPPY) on children's school performance at the end of the program and one year later. *Early Childhood Research Quarterly, 13*(4), 571–588.

Baker, A., Piotrkowski, C., & Brooks-Gunn, J. (1999). The home instruction program for preschool youngsters (HIPPY). *The Future of Children, 9*(1), 116–133.

Campbell, F., Ramey, C., Pungello, E., Sparling, J., & Miller-Johnson, S. (2002). Early childhood education: Young adult outcomes from the Abecedarian project. *Applied Developmental Science, 6*(1), 42–67.

Campbell, F., Pungello, E., Kainz, K., Burchinal, M., Pan, Y., Wasik, B., et al. (2012). Adult outcomes as a function of an early childhood educational program: An Abecedarian project follow-up. *Developmental Psychology, 48*, 1033–1043.

Department of Education, Employment and Workforce Relations. (2009). *Belonging, being and becoming. The Early Years Learning Framework for Australia*. Canberra, Australia.

Desforges, C. (2003). The impact of parental involvement, parental support and family education on pupil achievement and adjustment (Research Report RR433). London: Department for Education and Skills.

Evangelou, M., Smith, S., & Sylva, K. (2006). *Evaluation of the Sutton Trust shopping centre project: Room to Play*. Oxford: Department of Educational Studies, University of Oxford.

Evangelou, M., Coxon, K., Sylva, K., Smith, S., & Chan, L. S. (2013). Seeking to engage 'hard-to-reach' families: Towards a transferable model of intervention. *Children and Society, 27*(2), 127–138.

Evangelou, M., & Wild, M. (2014). Connecting home and educational play: Interventions that support children's learning. In L. Brooker, M. Blaise, & S. Edwards (Eds.), *The sage handbook of play and learning in early childhood* (pp. 376–390). London: Sage.

Fleer, M. (2011). 'Conceptual play': Foregrounding imagination and cognition during concept formation in early years education. *Contemporary Issues in Early Childhood, 12*, 224–240.

Ginsburg, H., & Amit, M. (2008). What is teaching mathematics to young children? A theoretical perspective and case study. *Journal of Applied Developmental Psychology, 29*, 274–285.

Ginsburg, H., Joon Sun, L., & Boyd, J. (2008). *Mathematics education for young children: What it is and how to promote it. Social Policy Report.* Society for Research in Child Development.

Goswami, U. (2003). Early phonological development and the acquisition of literacy. In S. Neuman & D. Dickinson (Eds.), *Handbook of early childhood literacy research* (pp. 111–126). New York: Guildford Press.

Grbich, C. (2013). *Qualitative data analysis: An introduction* (2nd ed.). Thousand Oaks, CA: Sage.

Hancock, K., Lawrence, D., Mitrou, F., Zarb, D., Berthelsen, D., Nicholson, J., et al. (2012). The association between playgroup participation, learning competence and social-emotional wellbeing for children aged 4–5 years in Australia. *Australasian Journal of Early Childhood, 37*(2), 72–81.

Jackson, D. (2011). What's really going on? Parents' views of parent support in three Australian supported playgroups. *Australasian Journal of Early Childhood, 36*(4), 29–37.

Jackson, D. (2013). Creating a place to 'be': Unpacking the facilitation role in three supported playgroups in Australia. *European Early Childhood Education Research Journal, 1*, 77–93.

Krueger, R. (2009). *Focus groups: A practical guide for applied research*. Thousand Oaks, California: Sage.

McArthur, M., Butler, K., Grealy, C., & Olver, K. (2010). *Supported playgroups and parent groups SPPI outcomes evaluation*. Victoria: Urbis Social Policy Team, Victorian Department of Education and Early Childhood Development.

McLean, K., Edwards, S., Colliver, Y., & Schaper, C. (2014). Supported playgroups in schools: What matters for caregivers and their children? *Australasian Journal Of Early Childhood, 39* (4), 73–80.

Melhuish, E., Phan, M., Sylva, K., Sammons, P., Siraj-Blatchford, I., & Taggert, B. (2008). Effects of the home learning environment and preschool centre experience upon literacy and numeracy development in early primary school. *Journal of Social Issues, 64*(1), 95–114.

Skwarchuk, S. (2009). How do parents support children's numeracy learning at home? *Early Childhood Education Journal, 37*, 189–197.

Sylva, K., Melhuish, E., Sammons, P., Siraj-Blatchford, I., & Taggart, B. (2004). *Effective preschool provision*. London: Institute of Education.

Tudge, J., & Doucet, F. (2008). Early mathematical experiences: Observing young black and white children's everyday activities. *Early Childhood Research Quarterly, 19*, 21–39.

Vygotsky, L. S. (1987). *The collected works of L. S. Vygotsky. Volume 1. Problems of General Psychology* (M. Hall, Trans.). New York: Kluwer Academic/Plenum Publishers.

Yelland, N., Gilbert, C., & Turner, N. (2014). iPlay, iLearn, iGrow: Using iPads in a play-based kindergarten program. *Every Child, 20*(3), 14–15.

Wager, A., & Parks, A. (2014). Learning mathematics through play. In L. Brooker, M. Blaise, & S. Edwards (Eds.), *SAGE international handbook on play and learning in early childhood* (pp. 216–227). London: Sage.