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# Broadening the circumference: A socio-historical analysis of family enactments of literacy and numeracy within the official script of middle class early childhood discourse

## Abstract

Informed by socio-historical theory, this paper will report on a study that sought to document the literacy and numeracy outcomes for children living in low socio-economic circumstances in a region south-east of Melbourne, Australia. The research focused on children in preschool and child care centres in the year prior to beginning school, and was designed to map literacy and numeracy experiences of children in the home and in the early childhood centre. In this paper an analysis of the cultural tools that families were intentionally developing in the context of their homes and communities is featured. A socio-historical analysis of the data revealed children's active engagement in the funds of knowledge (Moll and Greenberg 1990, Moll, 1990, and Moll, 2000) available within the community, the situated nature of learning (Lave and Wenger, 1991) within their communities, and the challenge for families transcending the constraints of 'everyday learning' to engage with 'school learning' (Hedegaard, 1998). The study also revealed the institutional barriers to learning the landscape of schooling (Greeno, 1991) and the deficit positioning evident for children and their families within the official script of middle class early childhood discourse (Flear, 2003).

## Introduction

Family-related and community-related outcomes have been shown to influence children's subsequent achievement. In a best evidence synthesis of international research, it was found that family attributes, family processes, community factors and centre/school, family and community partnerships were the key levers for high quality outcomes for diverse children. For example, Biddulph, et al. (2003) have shown that family attributes such as culture and ethnicity, and family language, influence children's achievement, with the dominant cultural groups (and those whose first language is the language of instruction) achieving at the highest levels. Quality of family ties (not structure or change in structure) and the resources available to families were also shown to be linked to high achievement. However, low socio-economic circumstances were connected with low achievement for children.

Research demonstrates the importance of family for children's success in schools, but we know very little about how families support concept formation in literacy and numeracy, particularly the interphase between everyday concept formation and scientific or schooled concept formation (Vygotsky, 1987).

This paper will report on a project that sought to document literacy and numeracy outcomes for children living in low socio-economic circumstances in a region south-east of Melbourne, Australia. The study was designed to map literacy and numeracy experiences of children in the home and in the early childhood centre in order to better understand how literacy and numeracy were being constructed across contexts. The data generation and data analysis of the project were informed by socio-historical theory, in particular Rogoff's (1998) three foci of analysis.

## Socio-historical informants for research

Development is a cultural process (Rogoff, 2003), and to understand development we should examine neither individual children nor institutional structures, nor even cultural belief systems, but rather to observe the *dynamic processes* of children engaged in daily activity with other people (Gaskins, 1999). The interlacing, rather than the displacement or separate study of all these dimensions, constituted Vygotsky's concept of the cultural-historical development of children (Vygotsky, 1997).

Vygotsky argued that in the development of the child, there are two types of mental development that are represented (not repeated). These are biological and historical, or natural and cultural development of behaviour. Vygotsky stated that to 'study history is not to study the past. To study something historically means to study it in motion.' (Vygotsky, 1997: 43). He suggested that:

...culture creates special forms of behavior, it modifies the activity of mental functions, it constructs new superstructures in the developing system of human behavior. This is a basic fact confirmed for us by every page of the psychology of primitive man (sic), which studies cultural-psychological development in its pure, isolated form. In the process of historical development, social man changes the methods and devices of his behavior, transforms natural instincts and functions, and develops and creates new forms of behavior – specifically cultural (Vygotsky, 1997: 18).

Vygotsky argued that traditional approaches to psychological research focused on studying elements – such as walking or talking. However, the perspective that Vygotsky introduced 'is based on understanding child development as a dialectical unit of two essentially different orders, and it sees the basic problem of research to be a thorough study of the one order and the other a study of the laws of their merging at each age level' (Vygotsky, 1997: 22).

Research that understands development of higher mental functions in this way always tries to comprehend this process as part of a more complex and broad whole, in connecting with biological development of behavior, against a background of an interlacing of both processes (Vygotsky, 1997: 22)

Vygotsky (1997) also argued that it is in these relations, where higher levels of psychological functioning are developing (inter to intra), that social beings actively select those dimensions that interest them, and which they have been socially primed to notice and want to understand. Vygotsky foregrounded the importance of a 'whole social context' (as apposed to introducing fragmented and isolated skills or concepts) in which imitation is of great importance. However, Vygotsky had a technical definition of imitation in mind when he introduced this concept (see Chaiklin, 2003: 52). As Vygotsky states we must 'reject the opinion that reduces the essence of imitation to the simple formation of habits and to recognize

imitation as a substantial factor in the development of higher forms of human behaviour' (Vygotsky, 1997: 96). Vygotsky argued that an individual can only imitate when she or he has developed some understandings. That is, 'imitation is possible only to the extent and in those forms in which it is accompanied by understanding' (p. 96). With this orientation to cultural development in mind, the importance of the *social whole* and the dialectical relationship between biological and historical (subjective and objective as elaborated by Chaiklin, 2003) become evident.

This notion has laid the foundation for others working in socio-historical theory to integrate individual learning and development in social, cultural, and historical contexts (Rogoff, 2003).

Thus in researching children's development of literacy and numeracy skills, it is important to examine how children are learning through participation with others in culturally relevant activities, and further, to study their use of the symbolic and cultural tools that are both inherited and transformed by successive generations (Rogoff, 2003).

Moll (1992) has successfully adopted an approach to studying literacy in which the household as a social structure, with a special focus on the labour-related activities and relationships within households and among networks of households, and the participation of children in these activities, has been a major emphasis of analysis. Focusing on the connection between productive, labour-related activities and school-related learning activities in families in lower socio-economic circumstances in Tucson, Arizona, this study has highlighted two aspects that have important implications for the study and the teaching of literacy. First is the nature of the social networks, which in households (in contrast to classrooms) never function alone or in isolation, but are connected with other households and institutions. Second, an important func-

tion of these social networks is the sharing or exchanging of 'funds of knowledge' (Moll, 1992: 217, building on the work of Greenberg, 1989 and Vélez-Ibáñez, 1988), where literacies (ways of using language for a variety of purposes) play a role in building on and extending existing funds of knowledge. In this way, communities accrue 'funds of knowledge' which Daniels (2001) has argued can inform pedagogy. Like Moll and Greenberg (1990: 320) we adopt the view that 'every household is, in a very real sense, an educational setting in which the major function is to transmit knowledge that enhances that survival of its dependents'. Daniels (2001) notes:

Moll [1992] argues that schools should draw upon the social and cognitive contributions that parents and other community members can make to children's development. Through anthropologically driven studies of learning in clusters of households much has been learned about the ways in which knowledge is built and acquired in such settings (Daniels, 2001: 118)

Moll (1992) proposes that:

...in studying human beings dynamically, within their social circumstances, in their full complexity, we gain a much more complete and...a much more valid understanding of them. We also gain, particularly in the case of minority children, a more positive view of their capabilities and how our pedagogy often constrains, and just as often distorts, what they do and what they are capable of doing (Moll, 1992: 239).

Documenting the intentional acts of families as they help their children learn the literacy and numeracy landscape (Greeno, 1991) that is located in schools can provide a rich and dynamic data set. In adopting a socio-historical framework for research, Göncü (1999) considers three specific questions for investigation:

- (1) What are the activities that are available for children in their communities?

- (2) How do children engage in those activities?  
 (3) What do they learn as a result of that engagement? (Göncü, 1999).

Further, in the data generation and data analysis processes it can be enlightening to employ Rogoff's (1998) three foci of analysis – the personal, interpersonal and community/institutional. This enables the focus of research to move beyond individual children or their families, to include factors such as community constructions of literacy and numeracy and the value placed on these, and tools available and how they are used. In addition, the multiple pathways to learning within the community can be highlighted, as well as the perceptions of teachers within early childhood settings of the learning that is occurring in the home. In essence the circumference (Burke, 1969 cited in Wertsch, 1998) has broadened beyond the traditional 'school learning' context or 'family learning' context to include the *dynamic region of interactivity within and across child, family, community and school contexts*.

Daniels (2001) suggests that 'what is described as post-Vygotskian theory tends to ignore what may be called the sociology of pedagogy' (Daniels, 2001: 102). Daniel's sensitively examines socio-historical theory in relation to recent thinking in sociology and foregrounds the nature of institutional regulations and how they constrain or liberate at the interpersonal level. He argues that there is a

... need for detailed ethnographic study which will enable us to 'see' some of the ways in which institutional effects contribute to the 'social administration of the social individual'. I would suggest that there is much to be done in 'learning the landscape' (Greeno, 1991) of socio-institutional effects from a post-Vygotskian perspective (Daniels, 2001: 154).

The institutional effect on children's learning in literacy and numeracy in the socio-historical context of children's family and commu-

nity experiences is important as the unit of analysis is not simply the home or the school, but rather the dynamic region between these two contexts. Daniels (2001) in drawing upon Mercer's (2000) and Lee's (2000) research suggests that through studying classrooms (or early childhood centres, as in the case of the present study) we make explicit that which is tacit in the rule systems that regulate and typify patterns of communication and participation in classrooms' (Daniels, 2001: 127). Daniels (2001: 128) in quoting Reid (1998) states:

...disadvantaging students who are unfamiliar with, and unpracticed in using, the particular participation structure; controlling students' responses in ways that lead to under estimation of their communicative competence and abilities; constructing power relations that establish the teacher as sole arbiter of 'truth' and limiting the flow of social interactions among students (Reid, 1998: 392).

In the context of literacy and numeracy, the capacity for children to learn the landscape of schooling (Greeno, 1991) is further complicated by the need to learn the genre (see Christie, 1985; 1993) of each discipline area. In this study, we were interested in how families and centres each constructed literacy and numeracy for preschool aged children. Socio-historical studies within school contexts have demonstrated that subject domains also have their own language. Daniels (2001: 159-160) in quoting Foley (1991) elaborates on this further:

... technicality and abstraction as tools (in the Vygotskian sense) with which to explore the subject areas of the curriculum. The student, therefore has to learn to marshal the language of technicality and abstraction in ways appropriate to each discipline. The special registers of the subject areas of the school curriculum should reflect how those registers are used in real life as these have evolved as ways of getting on with different kinds of work in the world. Knowledge

of specialised registers is a powerful means of access in society and therefore needs to be taught as this gives the student conscious control, at least to some degree, of these technologies (Foley, 1991: 32).

Yet there is a significant body of research that suggests that schools assume, rather than teach the register and genres of specific discipline areas. This research also recommends that effective teaching makes the discourse of both schooling and discipline areas visible to children. Daniels (2001) in citing Kozulin (1998) states that

...entering formal schooling requires a repositioning with respect to knowledge on the part of the pupils. The skills required for sensitive pedagogical assistance and the understanding of the scientific concepts which constitute the knowledge domains become necessary features of effective teaching and learning which makes claims to a Vygotskian root (Daniels, 2001: 110)

Thus, in reflecting on how scientific or school discipline knowledge differs from everyday thinking it can be useful to consider Vygotsky's (1987) arguments concerning the complex relationship between *scientific* concepts, or concepts that are 'adopted by the child in completed form from the domain of adult thinking' (Vygotsky, 1987: 169) and *everyday* or spontaneous concepts. The latter develop from below to above, from more basic to higher characteristics of thinking, while the former develop from above to below, from the more complex to the more elementary. Both are strongly connected to each other.

Contemporary research into schooled and everyday concept formation has elaborated Vygotsky's ideas further. Hedegaard (2002), for example, has suggested that:

The teacher, who wants the student to learn and appropriate knowledge and skills that can transcend the classroom activities and influence the student's everyday activities, has to acknowledge

the student's personal everyday cognition as a font of knowledge he (sic) must build upon and develop. The problem for the teacher then is to create learning activities that connect subject-matter knowledge with students' everyday cognition rooted in their activities both within and outside school (Hedegaard, 2002: 23).

Hedegaard (2002) argues that schooled knowledge tends to be static and does 'not open up for a flexible combination and integration with the child's everyday concepts' (p.33). She states:

The school teaching will separate pupils' understanding into disparate categories, one that belongs to school subjects and another to everyday experiences. This does not allow pupils to get an insight into how specific factors or experiences are connected with specific conditions. Instead, they will appropriate knowledge of facts within different subject areas which are difficult to relate to one another (p. 33).

She also argues that one of challenges of schooled knowledge 'is that the concept and context of school are not relevant for social practice outside school' (Hedegaard, 2002: 51). Hedegaard outlines the idea of a double move in teaching. That is, the teacher has in mind both the school subject knowledge (scientific concept formation) and the importance of everyday cognition (everyday concept formation) in order to engage children in "situated" and meaningful problems. Through a comprehensive 'embedded multiple case design' she provides empirical evidence for, and elaborates upon, Vygotsky's original work on scientific and everyday concept formation. The importance of this type of contemporary research design has been noted by Daniels (1996). Daniels (1996) suggests that as researchers we should change our focus from simply studying concepts in isolation to examining children's conceptual understandings within an embedded and richly based context.

It is through a more broadly based study

which examines the construction of literacy and numeracy within homes, communities and schools and centres that greater insights can be made about not just children's learning, but how contexts and institutions build and construct literacy and numeracy in different ways. In this way it is possible to see how everyday and scientific thinking in literacy and numeracy are introduced, framed and supported – whether intentional or unintentional. Socio-historical theory best explains this approach to research, as it recognises that learning does not simply reside in the individual, but, is intrinsically related to participation with others in socioculturally relevant activities, and is distributed across people as they participate in cultural experiences, transforming cultural frameworks and artefacts/tools across contexts (Rogoff & Chavajay, 1995).

## Study context and design

The study was framed from a socio-historical perspective. This research specifically featured Göncü's (1999) guiding questions:

- What are the activities that are available for children in their communities?
- How do children engage in those activities?
- What do they learn as a result of that engagement?

## Sample

Four preschools and one child care centre and their associated families from an area of Victoria, Australia were involved in the study (total of 65 families). The region is located south of Melbourne, Victoria and is predominantly an industrial working class area with a very high level of unemployment and single and blended families. Unemployment levels are considerably higher than for other parts of the shire (11.2% compared to 6%). Table One provides details, where the first two columns within the 2001 data refer to the specific area in which our study was located.

The occupations of people living in the area includes 6.2 percent managers or administrators, 7.9 percent professionals, 8.8 percent who are associate professionals, 17.3 percent tradespersons, 28.7 percent clerical, sales and

**Table One: Employment status for region**

Employment status 2001			
(persons aged 15 years and over)	number	%	Mornington Peninsula Shire %
Employed full time	1,418	56.5	57.4
Employed part time	719	28.6	33.6
Employed not stated	94	3.7	3.0
Total employed	2,230	88.8	94.0
Total unemployed	280	11.2	6.0
Total labour force	2,510	100.0	100.0
Total in labour force	2,510	51.7	56.2
Total not in labour force	2,069	42.6	38.5
Not stated	274	5.6	5.3
Total	4,852	100.0	100.0

Source: Derived from the Australian Bureau of Statistics, Census of Population and Housing, 2001, 1996 and 1991. NB: Table totals may not equate with other similar tables due to randomisation of small numbers – see the “Important Data Notes” in the section “How many Are We”. Further, percentages may not total to 100 due to rounding errors.

(Source: Mornington Peninsula Shire <http://www.id.com.au/mornpen/commprofile/> accessed 15.04.04)

service, 13.6 percent production and transport and 14.3 percent labourers. The occupation structure concentrates upon less skilled and socio-economically disadvantaged job-types and a substantially lower proportion of professionals than for other towns within the shire.

The population is predominantly Australian born, with only a third owning their own home.

The families in this study came together each day through their children's preschool or child-care centres, and through other regular social experiences. They demonstrated a strong sense of community belonging, and enjoyment of living in what they saw as a semi-rural environment that provided a somewhat protected, more caring and freer existence for their children than that experienced within urban areas. They frequently shared tasks such as babysitting and child care, along with a range of other skills and resources that various members of the group possessed, such as sewing, lending books, providing transport, and helping harvest fruit in orchards. Advice on child rearing was commonly imparted through this close and supportive network. As with Moll and Greenberg's (1990) study, the multiple, complex relationships and networks that existed among the families, contrasted with the narrow teacher-child relationships that existed in many of the preschool and child care classrooms (and certainly within the primary school classrooms) in this study.

### Data gathering framework

Participating families were invited to take home a disposable camera and to take photographs of everyday experiences that families believed represented literacy and numeracy practice within the home and community. Photographs were developed and families prepared photo albums of their child's everyday experiences. Participating families came together, sharing with each other (using their

photo albums) their child's experiences. The families discussed the everyday literacy and numeracy contexts that the children experience. The selected photographs were loaded into a PowerPoint, alongside of the parents' comments, and shared with both teachers and principals/directors in the centres and schools. Both the family sharing session and the teacher sessions were facilitated as small and whole group discussions, with a scribe in each group documenting all discourse in situ on a laptop. The questions guiding the family small group discussions were:

- what everyone could see in the photographs about literacy and numeracy (personal lens; Rogoff, 2003)
- what only the family can see within the photograph (in terms of the interpersonal issues) that constitutes literacy and numeracy (interpersonal lens; Rogoff, 2003); and
- what literacy and numeracy practices were so much a part of everyone's everyday life that you could no longer see them (institutional/cultural lens; Rogoff, 2003)

At the teacher sessions, participants were also invited to discuss these questions

Teachers discussed what they perceived about the literacy and numeracy practices occurring in the homes of the children they taught.

## Findings

In this paper an analysis of the cultural tools that families were intentionally developing in the context of their homes and communities is featured along side teachers' constructions of literacy and numeracy. For a discussion of the broader findings of the study see Fleer, Ridgway, Clark, Kennedy, Robbins, Surman, Hallinan and O'Farrell (2004). A socio-historical analysis of the data revealed 5 areas, closely

aligned with, but expanding upon, Göncü s (1999) three questions mentioned earlier in this paper:

- Funds of knowledge – The experiences that are available to children in their communities.
- Situated cognition – Contextually specific learning
- Transcending the constraints of the everyday – How do children engage?
- Learning the landscape – What are children learning as a result of their engagement?
- The official script – Teachers' perceptions, middle class discourse and deficit views

These are discussed in turn.

### **Funds of knowledge – The experiences that are available to children in their communities**

In this study, families spoke about their intentional participation (referred to by Rogoff, et al., 2003, as 'intent participation') in literacy and numeracy activities with their children. Families easily identified everyday experiences in which literacy and numeracy were embedded. For example, in discussing the photographs taken, V and L outline a range of contexts that provide opportunity for the building of 'funds of knowledge' (Moll and Greenberg 1990, Moll, 1990, and Moll, 2000) in relation to literacy and numeracy within everyday contexts:

*Here she is measuring out the flour and here we are making fairy bread... this is her coming shopping with me and she is counting out the bananas, I said that I wanted three. (V)*

*She is counting her pocket money to see if she has enough to buy what she wants to buy. (L)*

Many of the examples shared by families revolved around identifying how children use and are supported in using the conceptual tools

of literacy and numeracy to navigate their way within their home and community. An analysis of the overall data demonstrates that children were positioned to acquire the cultural knowledge needed for using literacy and numeracy in everyday contexts. Families in this study regularly highlighted intent participation in fostering literacy and numeracy learning. The examples above illustrate the major way in which families spoke about literacy and numeracy when sharing their photographs with each other and the research team.

Another feature of intent participation in fostering learning discussed by families related to siblings wishing to undertake the activities of schooling as observed when older siblings do homework or practise the skills learned in school. For example, the schooling discourse was featured in nearly all families where the preschool child under study had an older sibling.

*... Her brother is in prep and she likes to look at his take home book....My son is really good at maths, and she really likes to do what he is doing and he likes the calculator, and that is what she is doing (in the photograph being shown to other family members) (L)*

L's daughter observed how her brother worked with the calculator with the purpose of using the tool herself. She observed the schooling discourse for engagement in the use of the calculator. In the context of this and other family explanations of their photographs, with the exception of one example (discussed later), no instruction on the part of older siblings to the focus child in the study, were discussed by families. Rather the assumption was that the younger child would learn from the older child features of schooling. As a third party observer, L's daughter did not expect instruction from her brother. Rogoff, et al., (2003: 178) argue that 'third-party observation is especially understudied'.



In this study, the discourse of schooling was framed by families as another everyday activity such as ‘visiting the shops to buy bananas’ (V) or ‘counting pocket money’ (L). Families discussed ‘schooling discourse in the home’ as though it were simply another everyday home activity in which literacy and numeracy were enacted, as is evident when the whole of L’s transcript is shown:

*...someone told me about (the local library), and so we went there and they do activities and like rhymes and make something. I have got some writing ones, the first time a child writes her name is really special, She wrote it backwards, so I kept it. Her brother is in prep and she likes to look at his take home book. We have lots of games and CDs to keep them busy, lots of things she likes to do. My son is really good at maths, and she really likes to do what he is doing and he likes the calculator, and that is what she is doing. She is counting her pocket money to see if she has enough to buy what she wants to buy. (L)*

In examining L’s and V’s (below) list of numeracy and literacy activities, games (including CDs) and reading also featured. These experiences, which illustrate literacy and numeracy, as identified by V and L, were not designed for instructional purposes. The purpose of participation described here fits within the framework discussed by Rogoff, et al., (2003) where ‘the model provided by persons engaged with them but not for the purpose of instruction’.

*Here she is measuring out the flour and here we are making fairy bread. It is just us at home, and so here we are playing board games, like memory and the cards, and she has to work out which is which. Here she is just doing jigsaws, and this is her with her Daddy, reading stories at the night time, her room, nearly every space is covered with lots of bright coloured things. This is her coming shopping with me and she is counting out the bananas. I said that I wanted three. This is just another computer game, educational, like you get a few tries to get it right. (V)*

Taken together, these data illustrate that the majority of these families of lower socio-economic circumstances engaged in a form of intent participation for supporting numeracy and literacy. As such, the findings of this study suggest that in this particular community, intent participation, as described, fits with studies from a range of cultural groups (Rogoff, 1990; 2003; Rogoff, et al., 2003) and is distinct from middle class family interaction patterns where the schooling discourse is explicit and normalised (see Chavajay and Rogoff, 1999; 2002).

The funds of knowledge developed in these families’ daily lives highlighted the importance of using literacy and numeracy within everyday contexts. Using numeracy at the shops, using school-framed numeracy discourse for investigating artefacts (such as the calculator) found in schools (rather than seeing them used in the home), and engaging with, rather than being instructed on, numeracy and literacy for effective participation in games, were all important community capital needed by children for purposeful engagement in everyday life.

### **Situated cognition**

#### **– Contextually specific learning**

One of the dominant features of this study was the situated nature of literacy and numeracy. The previous section illustrated this also. However, there were some subtle differences in the framing and the discourse associated with the embedded experiences shared by families. For example, K illustrates the way in which numeracy is embedded in their family discourse:

*Well with the number thing, we go walking everyday and they got into the habit of counting the numbers on the houses and sometimes it would take us half an hour extra because they were counting. (K)*

This is also evident as La discusses how she introduced her son to counting. Once again the discourse of ‘counting’ features:

*Out of the two photos – he took it that as far as he was concerned, he was allowed to take the photos – there’s the family dog. But that’s how we started him counting, one dog, one cat, by two and a half he was able to count to ten! (La)*

In both examples, the parents discuss the importance of ‘counting’ as a discrete numeracy outcome that they wish their children to gain. However, both examples illustrate the way in which families actively look for local environmental contexts that are meaningful to their child. La has featured the family pets, whilst K has discussed the houses in the neighbourhood – both as important concrete contexts in which to introduce the names of numerals. Both, as framed encounters with repetition, have the potential to build situated cognition.

In the example below, C also concentrates upon counting money. Although she mentions the word ‘teach’, the focus is on morals and the intent is not as illustrative of assembly line instruction (traditional schooling pedagogy), as discussed by Rogoff, et al., (2003).

*He’s counting his money from his moneybox (referring to photo). I let him spend his money, teach him about his money. (He must learn that) he can’t have everything, and I teach him to save his money, collect and count out the pocket money... (C)*

In this study, the Australian families were able to discuss everyday numeracy and literacy activities/conversations in the home and community. Whilst the children do not participate in all facets of mature settings (such as going to work with a family member, or working with family members at home as the main income source), they were nevertheless participating in the day-to-day routine of ‘domestic life support tasks’ encountered in the home and community (e.g. cooking, cleaning, shopping). This latter aspect constitutes the lived experience of many of the families (for both parents are mostly without paid work).

This study has shown the multifaceted nature of intent participation. For some family members, such as K, intent participation meant building routines which supported ‘counting’ (as representing numeracy – a valued Western commodity) and for many others it meant using numeracy in order to live (i.e., bake a cake, set the table, go shopping). Whilst the creation of numeracy contexts (counting houses or pets) would appear to be focusing on abstract and decontextualised content, the families in recognising the value placed on numeracy by the community were intentionally building valued cultural knowledge about numeracy that related to their child’s life. Building numeracy discourse through creating routines and procedures is consistent with creating situated contexts for learning. The families predominantly situated numeracy and literacy in the everyday, but for some, they also created valued numeracy discourse within specified local contexts. What was unique about these latter examples, was the fact that the family members didn’t instruct or build lessons, but rather that they ‘walked along counting, taking them half an hour longer than if they hadn’t counted’. Literacy discourse was not discussed with the same intent of building children’s cultural knowledge about literacy. The reciprocity evident, is unlike the ‘quizzing or information delivery’ often encountered in schooling contexts (Rogoff, et al., 2003) or Western middle class families (Chavajay and Rogoff, 2002). Rather, the structure to support situated cognition created by these families was horizontal rather than hierarchical. Whilst many of the families (although not all, as one parent discussed the fact that she could not read) already held the cultural knowledge and therefore could not be thought of as learners, they did perceive themselves as novices in promoting literacy and numeracy as presented within schooling discourse, as demonstrated by Li’s first thoughts about the project, and L’s subsequent reflections.

*When I first got it (information about the project) and read the instructions, I thought, 'Literacy and Numeracy?'. Couldn't you be a bit more explicit? What should I take photos of?... It wasn't until, I started to realise, taking in the photos. Well, how does this relate? And to think about the way that would be literacy or numeracy. (Li)*

*There is much more to this literacy and numeracy than you realise, you know, from day one. (L)*

Overall, the context specific nature of numeracy and literacy dominated the data gathered.

### **Transcending the constraints of the everyday – How do children engage?**

It was noticeable from both the family workshops and the photo albums that children's learning in literacy and numeracy were celebrated, supported and scaffolded. For example:

*We did a letter drop, because we have a fundraiser. I gave B a pile and said I will do these numbers and you do those. Shapes, we play a game, like in the summer and we will look at the clouds and she will say "Mummy that cloud looks like a triangle" ... (V)*

Families were well aware of their children's capabilities, and were actively supporting and guiding the learning. The families framed their comments in ways that indicated that learning was a collaborative bonding experience for the whole family. For example, E discusses all her children's dispositions towards literacy below.

*M is my oldest, he is nearly five. He has got two younger brothers. He always loved books from a really young age. Not so much my second one. Always going to the library, we used to go to the library. He sometimes helps to set the table. He read the paper, he likes to recognise letters, he has only started in the last year really. (E)*

Whilst there was little evidence of tutoring generally, it did arise in relation to an obvious 'school artefact' and 'schooling discourse'.

However, the comments reflect an 'output' and a process of 'being together with her older brother':

*With the calculator, she is learning to add up... So they pull it out, her and her older brother. He has taught her 7 plus 7 is 14. She is learning it herself by being with her brother. He will read to her. (Ca)*

The use of cultural tools with embedded numeracy learning was also evident. For example, whilst reading billboards and road signs was common, so too was reading the street directory (known in the state of Victoria, Australia, as the *Melways*):

*He reads the Melways. He said, 'There is a traffic light coming up!' And I said, 'How did you know that?' He said, 'It has a red dot here'. (Ln)*

In this study it was evident that the children engaged directly in many potentially rich numeracy and literacy experiences. As discussed earlier, families demonstrated intent participation in literacy and numeracy within embedded, meaningful and relevant everyday contexts. Schooling discourse was mentioned (tutoring, quizzing, etc), but within the context of older siblings interacting with their preschool sibling. Unlike studies undertaken in middle class families in industrial communities (Chavajay and Rogoff, 2002), families did generally not discuss taking on a 'teaching role'. Rather than mini lessons being organised around decontextualised content with question-and-answer sessions, families spoke mostly about embedded interactions. Introduced concepts, such as counting, were created within meaningful everyday contexts for the children – where the focus was on joint participation rather than direct instruction.

This study has shown that the families built cultural knowledge of literacy and numeracy for operating within their homes and community. They were very successful in building horizontal discourse for their children. The

vertical discourse associated with building scientific concepts, as is needed to operate within 'schooling discourse' was less frequently outlined by families. This contrasts with middle class families from industrial communities, where the discourse of schooling is frequently heard (Chavajay and Rogoff, 2002). What is evident here, is that the families in this study built cultural knowledge for embedded contexts (everyday concepts) – ones where numeracy and literacy are played out and used – and middle class families built disembedded cultural knowledge in which children learn to engage with the dominant discourse of schooling. That is, they learn about disembedded literacy and numeracy concepts – or as Vygotsky discusses, they focus on scientific concepts. The family contexts for literacy and numeracy presented in this study feature everyday concepts, and it is the approach taken by families when introducing everyday concepts that can inform pedagogy in schools and early childhood centres. The relationship between everyday concepts and scientific concepts, as one moves downwards and the other upwards (Vygotsky, 1987), suggests that the families in this study have provided a breadth of everyday experiences that will pave the way very well for building scientific concepts.

### **Learning the landscape – What are children learning as a result of their engagement?**

As Moll (1992) reminds us, we gain a 'more positive view' of children's capabilities, particularly those from low socio-economic circumstances, but we also learn 'how our pedagogy often constrains, and just as often distorts, what they do and what they are capable of doing' (Moll, 1992: 239). This study has highlighted the strengths of family and community knowledge building in literacy and numeracy for communities of low socio-economic circumstances. Important approaches were identified which are significant

for transforming pedagogy in schools and centres. Whilst much can be gained in the long term from studies such as this, in the short term, families were concerned about their child's engagement with school:

*Mostly I remember playing (when I was at school), and that is why I worry. My boys, they play a lot, but when they get to primary school will they get bored? Or, you know, they have so much energy and I just wonder what will happen to them? I worry about a time when they have to sit down and listen. (E)*

Many families expressed concerns such as those identified by E. Some families spoke of the teachers not having enough time to really get to know their child, to build intersubjectivity. Many were concerned that teachers would not know about their child's interests or ways of learning – their dispositions, what engages them, the cultural knowledge they have. Families spoke of the schooling context as not allowing teachers time to learn about their child as a person. Some families also expressed concern for how children were positioned – as blank slates, or as K described, as babies:

*Something I have always, maybe it is too much, if my children ask me a question, I have always told them, like I always like answer as an adult, like some children at kinder are spoken to like babies, and I think that is annoying, so if they can handle the truth I tell it, sometimes I have made a mistake and told them too much, but they come back later (K)*

Many of the families spoke quite positively of their child's preschool or child care teacher, stating that they felt they understood the children well, as evidenced by the following comments by V:

*They asked in the start of the year didn't they, what they are good at? (L)*

*...there is good and bad in any trade. You think 'Why have you picked that profession?', like, if they don't have a rapport. Like J (preschool teacher), she has them eating out the palm of her hand, and I have done duty (as a parent helper) and I think, well, they have respect for J, and you have got to have a teacher who really wants to help...but J is really good, like she draws it out of them. Like, B is scared of heights, but here at the kinder she is learning to go up over the slide and it is ok. I think they are good at that, finding out what they can do. Like C is good with his hands, but another good at puzzles (V)*

However, what was evident in the data, was a concern by families that teachers in primary school were not in tune with the landscape of family and community practices and therefore had limited understanding of the 'funds of knowledge' that had been built. At the same time, it is clear from the findings of this study, that children's experiences did not match those of the landscape of schooling, with its particular discourse and practice.

Children learning the 'landscape of schooling' was expected by teachers. But teachers' learning the 'landscape of families and communities' was not an expectation evident in the data gathered in relation to teacher thinking in this study. The outcomes of this research suggest that we have much to do in fully appreciating the multiple landscapes of the learning communities which exist outside of schooling. Building into our teaching practices the expectation that we will explore these landscapes in order to better understand the cultural knowledge that children have, and that families actively support, will in itself provide the impetus for reappraising early childhood pedagogy.

**The official script – Teachers perceptions, middle class discourse and deficit views**

At the beginning of the second stage of the research project, fourteen teachers (from both early childhood centres and the primary

schools in which the children were enrolled for the following year) were shown the data gathered from the family contexts (photographs and transcribed family comments) and they discussed their impressions:

*There are opportunities for open ended learning, rich, enticing opportunities, rich, incidental learning (in the home contexts).*

*It's real life, in context, making sense...*

*At home all these things are happening.*

*They (the children) do come to preschool with a wider knowledge base, I reckon.*

*I was surprised by how much parents already do and know without the title of it.*

In this context, the importance of making connections between the learning taking place in the home, and the learning being generated in the school/centre, is paramount. Teachers' surprise at what was happening in the home indicates a lack of meaningful dialogue between schools and families.

A few teachers recognised the need for more active communication and empowerment of parents:

*A thing that has come out more for me today is that I need to listen to what they are doing. I do a lot of showing of what I am doing.*

*...it is apparent there needs to be communication, frank communication, making bridges.*

*This (PowerPoint of families' constructions of literacy and numeracy) would make a good video for parents starting school, saying this is what it is about. You are doing a good job. Keep on doing it. Thanks very much. And to make them feel successful.*

It became evident, though, that these were very much minority views. Most of the teachers expressed the view that the families' funds of knowledge in literacy and numeracy were

very limited, that they did little to promote the development of literacy and numeracy skills, that they provided little support for teachers, and that they needed to be 'educated' about these issues by the 'professionals'.

Edwards (2000) warns of the dangers of closed communities of practice that are forever recycling old and tired knowledge. 'A socio-cultural perspective suggests that in order to develop practice, practitioners need to be able to distinguish between cultural capital, which can be usefully used, and cultural baggage, which inhibits the development of practice' (Edwards, 2000: 186). Many of these teachers appeared to be holding on to the 'cultural baggage' of a deficit view of families' conceptualisations of literacy and numeracy, focussing on negative aspects, or implying that while *they* held knowledge parents did not share the same level of expertise. While this view exists it can be difficult for teachers to acknowledge fully the rich cultural knowledge families possess, and, in turn, for their own practice to move forward. Further, it serves to confirm the concern held by families that teachers in primary school were not in tune with the landscape of family and community.

Some teachers were actively dismissive of parents, with the following comments being typical:

*I have parents say, 'My child knows the alphabet', and I find they might know two letters and the parents say they can sing it!*

*...that (teaching upper case letters at home) is embedding something in their minds that has to be undone. They know it. They (children) bring names of letters and they are of no use to them.*

*Parents say, 'I didn't realise you teach phonics'; and I think, 'It never went out!'*

*I remember a Mum telling me that her child was reading (when she started school), and I thought, 'Don't be ridiculous'.*

It is not surprising, then, that families feel somewhat intimidated and concerned about developing partnerships with schools, when teachers are expressing views such as these. In addition, the absence of recognition by teachers of families' cultural knowledge can result in comments such as the following, demonstrating the lack of reciprocity that can develop:

*We find it so difficult to get parents to come, to train parents to be helpers in the classroom; we just can't get them to come, if they are out there!*

Of great significance was the absence of discussion surrounding the merging of everyday thinking, as enacted within family contexts, with scientific thinking (or school discipline knowledge). Daniels (2001) notes that where teachers do not attend to the ways in which understanding develops, learning of curriculum content may be difficult. What results is that teachers may not always foreground the links between the everyday and scientific concepts, nor acknowledge the multiple ways of carrying out a task (Vygotsky, 1987).

In this study, families demonstrated the many ways in which everyday thinking in literacy and numeracy were being fostered. Important scientific concepts were being gained, but through *embedded* use. Discipline knowledge for both numeracy and literacy were not featured within the home context (except when an older sibling worked within a schooled discourse).

Also absent was how teachers could make visible the schooling discourse and practice to the children. This '...requires the learner to adopt the *culture* of a discipline such as mathematics rather than to merely use its tools (Wilson, Teslow & Taylor, 1993: 82, cited in Daniels 2001: 112; our emphasis).

Overall, the deficit view held by teachers of the children and their families from lower socio-economic circumstances seemed to cre-

ate a block in learning the literacy and numeracy landscape built within the home and community for the children in their charge. Through the denial of the rich literacy and numeracy possibilities and practices within families, teachers were clearly not in a position to critically appraise their own practice, to acknowledge what Vygotsky (1987) refers to as the historical nature of development (to study learning in motion), to forge links, to explicitly concentrate upon building pathways between localised everyday concept development, and scientific school concept development. As such, the family practices were simply silenced, and mainstream schooling discourse was foregrounded, privileging those families who practiced such discourse in their homes.

## Conclusion

The findings of this study present exciting new understandings about the funds of knowledge (Moll and Greenberg 1990, Moll, 1990, and Moll, 2000) available within lower socio-economic communities for building cultural knowledge in literacy and numeracy. The outcomes of the study also demonstrate children's active engagement in the situated nature of learning (Lave and Wenger, 1991) within their communities, and the expected challenges to be found as children transcend the constraints of 'everyday learning' to engage with 'school learning' (Hedegaard, 1998). The study also revealed the institutional barriers to learning the landscape of schooling (Greeno, 1991) and the deficit positioning evident for children and their families within the official script of middle class early childhood discourse (Fleer, 2003). In calls for closer family-school links Moll and Greenberg (1990) declare that:

We perceive the students' community, and its funds of knowledge, as the most important re-

source for reorganising instruction in ways that 'far exceed' the limits of current schooling. An indispensable element of our approach is the creation of meaningful connections between academic and social life through the concrete learning activities of the students. We are convinced that teachers can establish, in systematic ways, the necessary social relations outside classrooms that will change and improve what occurs within the classroom walls. These social connections help teachers and students to develop their awareness of how they can use the everyday to understand classroom content and use classroom activities to understand social reality (Moll & Greenberg, 1990: 345-346).

The reciprocity between schools and families for learning the landscape of each context is needed. The study has shown that at the present time, children growing up in low socio-economic circumstances will continue to be disadvantaged in schools since the cultural knowledge they have acquired prior to formal schooling, and the intent participation processes they have experienced, are not well understood by the education community. Assumptions held by teachers working with children from low socio-economic circumstances regarding their prior to school experiences, position children as being deficit in their learning and development. This is consistent with other studies which have examined the interface between schooling and low socio-economic communities (Hill, Comber, Loudon, Rivaland and Reid, 1998).

This study has shown that teachers do not routinely examine the learning landscape of their children, and the children's 'slow to warm up' approach in schools as they navigate a whole new learning landscape, is viewed by teachers as a lack of literacy and numeracy competence, reinforcing their deficit beliefs. Through examining the learning landscape of families, it is more likely that the 'slow start to school' children will be viewed as experiencing a mismatch between school discourse and

practise and family intent participation experience. Optimistically, because the children's learning landscape is unlike those of middle class children, teachers are more likely to think differently about the interaction patterns of children who are adjusting to a completely new teacher discourse and learning style, and for some they may even re-think traditional middle-class schooling practice. Some may even find that the intent participation model suggested by Rogoff, et al., (2003) and found to hold true for the families in this study, is an attractive and more authentic pedagogy for 'doing schooling'. Thus the outcomes of this study add to previous work which problematises the official scripts found in schools and recommends that teachers move outside of assumed middle-class practices and begin to understand the learning landscape of more than simply one group of Australian children.

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## Acknowledgments

This research project was funded by the Australian Government, Department of Education, Science and Training. The teachers, families and children gave time and energy to this project. Without their willingness and enthusiasm for improving literacy and numeracy outcomes for young children it would not have been possible to have undertaken this project. Similarly, the work of colleagues in the overall project was extremely important for ensuring valid and reliable data: Barbara Clarke, Suzy Edwards, Marie Hammer, Anne Kennedy, Avis Ridgway, Lynne Surman, and Sue Willis. Special mention is made of Avis Ridgway who led the field team in organising and gathering data for this study and Wendy May who supported Avis in her work. Student contributions were also important – Jacqui Hallinan, Lauren O'Farrell, Marissa Prudden and Michelle Madden. Whilst colleagues' and students' contributions are acknowledged, any inaccuracies are the responsibility of the two authors of this article.