

## CULTURAL SPECIFICITY IN THE GUIDANCE OF CHILDREN'S METACOGNITIVE LEARNING

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PAPER PRESENTED AT THE  
1994 CONFERENCE OF THE AARE  
NEWCASTLE  
NOV 27-DEC 1

### Introduction

The developmental changes in problem-solving abilities of children have been attributed to the development of metacognitive skills in the service of solving a task (Flavell, 1976). Metacognition is often described as "thinking about thinking" and is categorised into two phenomena: (i) knowledge about one's cognitive processes and (ii)

control and regulation of cognitive processes. Cognitive self-regulation, the second component of metacognition is recognised as necessary for the successful completion of a task. It involves planning task activities, monitoring success or failure of actions, maintaining awareness of task goals, and coordinating strategies to reach the goals (Brown, 1978).

Research on the development of metacognitive skills in young children has expanded in recent years. The existing body of literature on metacognitive development suggests that in order to understand the development of metacognitive abilities (or self-regulation), one must examine the social or cultural contexts in which young children's problem-solving activities are conducted

( Freund, 1990; Moss, 1990; Portes, Zady & Smith, 1994; Rogoff, Mistry, Goncu & Mosier, 1993; Wertsch, McNamee, McLane & Budwig, 1980). Underpinning this view is Vygotsky's (1962; 1978) contention that development of self-regulatory abilities originates in cultural-historical process and are transferred to the individual through social interactions. Even in simple parent-child activities, parents seem to regulate the child's behavioural responses such as directing attention, maintaining goal direction, monitoring, and coordination of strategies to reach the goals. According to Vygotsky's theoretical perspective, the cognitive regulatory processes (goal direction, monitoring etc) the child must master to solve a problem independently are similar to the regulating acts which children are exposed by a competent adult during collaborative activities. Cognitive development proceeds when adult regulatory acts become internalised by the child to the degree that the child is able to regulate the cognitive processes independently. This transition from other-to self-regulation is one of the cornerstones of Vygotskian theory. Vygotsky (1978) specified that adults facilitate internalisation by (i) taking responsibility for those components that are beyond a child's capacities (ii) regulating a child's behaviour (ie., directing attention, maintaining goal, monitoring and so on), and (iii) transferring to the child those aspects of task responsibilities already mastered. The adult's sensitivity to the "zone of proximal development", that is, the distance between what a child can do with assistance and what a child has already mastered is a key concept in Vygotsky's theory of development.

Wertsch (1979) also indicated that other-regulation where a child is guided through a task by an adult member is the fundamental way in which children learn self-regulation. The role of adult mediation through linguistic or conventional acts in the transition from other-to-self regulation is emphasised by Wertsch (1979). Adult-child interaction has been recognised as an important setting for the emergence of metacognitive abilities. Several investigations designed from the perspective of Vygotskian theory have begun to explore the

impact of adult-child interactions on the development of metacognitive abilities in young children.

The role of adult interaction on children's metacognitive development has been illustrated in several micro-genetic analyses of the teaching-learning interaction (Gauvain & Rogoff, 1989; Moss, 1990; Paris, Newman, Jacobs, 1985). Various studies exemplified the fact that dyadic interaction structured by adults, provides the social or cultural guidance necessary for the development of metacognitive abilities. Variations in adult guidance as a function of the nature of task (Freund, 1990), age of the child (Freund, 1990), sex of the parent and the child (Mullis & Mullis, 1986) and parenting styles (Pratt, Kerig, Cowan & Cowan, 1988) have been highlighted in the literature.

The focus of the most of the above studies has been on mother-child interactions. Studies on children's interactions with significant others (father, peers, siblings and teachers) are also increasing. A consistent finding has been that adults are sensitive to child's competencies and developmental levels, and seem to adjust their guidance and regulation according to the individual requirements of the child and the task.

#### Cultural contexts for learning

Another and important line of investigation in adult-child interaction is beginning to focus on cultural contexts for children's development.

Rogoff (1990) indicated that cultural arrangements for children's activities with social members are important mechanisms for shaping the development of social or cognitive competencies. The need to examine children's participation in cultural routines for understanding the developmental processes of children is also emphasised in the literature.

While there is no certainty about the nature of cultural diversity in metacognitive learning settings (adult-child interactions), there are logical and theoretical grounds to believe that important differences might exist. Firstly, the developmental processes of children across cultures are not generic. This is because each culture values aspects and goals of development differently. This implies differences in the cultural contexts and arrangements for development.

Vygotsky's (1962) socio-cultural theory of development assumes that development can not be separated from the social or cultural context in which it occurs. This theory points to the need for analysis of cultural contexts in understanding developmental trajectories. Vygotsky (1978) contended that development involves internalisation of skills from participation in joint problem-solving with more skilled

partners, who bring the cultural tools, knowledge, and values to the zone of proximal development. Cole (1985) also argued that in the zone of proximal development culture and cognition create each other. Interactions in teaching-learning transactions (or zone of proximal development) facilitate utilisation of cultural tools and practices as well as participation in activities that would be difficult for children to do alone (Cole, 1985).

Central to the internalisation of skills by children is adult scaffolding or mediation in the zone of proximal development. According to socio-cultural perspectives, mediated action can not be separated from the cultural contexts in which it occurs. Accordingly, with differences in cultural contexts, mediational differences can also be expected. Rogoff et al (1993) have already documented differences in the cultural guidance of children's learning and emphasised the importance of understanding the societal basis of joint problem-solving. Major behavioural differences in mother-child interaction and teaching tasks have also been noticed between cultural groups (Dixon, Levine, Richman, & Berry Brazelton, 1984). However, there is little exploration of the cultural patterns of metacognitive guidance in the literature on metacognitive development.

Theoretical perspectives of Vygotsky (1978), the arguments of Cole (1985), and Rogoff et al (1993), point to the possibility of cultural differences in adult guidance of children's metacognitive learning. The major research question then, is are there differences in the way each cultural group offer metacognitive guidance in collaborative problem-solving activity? The paper reports the results of a small scale in depth pilot study of four Australian and Indian mother-child dyads during problem-solving transactions.

### The Problem

The primary research question was to explore the cultural variations in maternal guidance of children's metacognitive learning. To investigate this question, adult-child interactions on a problem-solving task in Australian and Indian cultural contexts were examined. Collaborated problem-solving encompasses both verbal and non-verbal interactions as the means of sociocultural and strategic communication. Non-verbal means of communication, while rarely studied, have important textual and strategic uses during collaborative

problem-solving. In the present work, verbal and non-verbal interaction behaviours will be considered, however with a major focus on verbal communication in maternal guidance.

### Methodology

#### Sample

Australian (Western Sydney) and Indian (Hyderabad) cultural communities were selected for comparison of maternal guidance of children's metacognitive learning for several reasons. Firstly, the principle investigator's familiarity with the two cultures and their accessibility. Selection of cultural groups on the basis of familiarity and cultural understanding is considered critical in cross-cultural studies (Rogoff et al, 1993). Secondly, there are large numbers of Indian children attending child care centres in Sydney.

The localities of Hyderabad and Western Sydney were selected because of their comparability in terms of urbanity and modernity. Considerable differences, also exist with respect to language, culture, family organisation, beliefs, values, and practices associated with child-rearing and education. Thus, the sample contrasts significantly in cultural dimensions while being comparable on socio-demographic dimensions.

Four mother-child dyads participated in this study, two Indian and two Australian. Mother-child dyads were recruited through child care centres. Mothers' ages ranged from 34-38 years. All held HSC qualifications or equivalent. Based on the indications in cross-cultural investigations (Bornstein, Tal, Tamis-LeMonda, 1991), educational background was used to control socio-economic status as well as to equate cultures. Indian fathers had white collar jobs, while Australian fathers held trade jobs. All children in the study were 4-years old. The children in mother-child dyads were girls in India and boys in Australia.

Children of preschool years have been selected because of the significance of this age for metacognitive development. According to Flavell, Speer, Green, and August (1981), between the ages of three and five, children show a readiness to operate on their own mental representations. Thus, this age might signify the necessity for adult assistance in the zone of proximal development. Mother-child dyads were selected because of the assumption that it is the mother, who plays a major role in guiding development, and specifically, metacognitive development.

#### Procedure

The study was undertaken in naturalistic home settings. The research procedures involved a brief interview and videotaping of mother-child dyads' interaction in a puzzle solving task. Task completion was videotaped to ensure authentic records of interactions and facilitate data retrieval for coding and analysis. The videorecording procedure was found to be an effective approach for collection of data on mother-child interaction. There were no problems with mothers' self consciousness over being observed. This has been highlighted in the literature as one of the methodological concerns in studies of

mother-child interaction.

Prior to completing the puzzles, each mother answered several questions relating to family background and attitudes to learning and teaching. This also served to develop familiarity with the researcher. The

mother-child dyad was then presented with two puzzles in order of increasing difficulty to complete.

The first puzzle was a relatively easy animal jigsaw (12 pieces of size 7 1/4" x 7 1/4"). This provided children with experience in puzzle completion and familiarised mother-child dyads with the videotaping process. The second task, also an animal jigsaw puzzle (60 pieces of size 11 1/2" x 11 1/2"), was more difficult for a 4-year-old to do alone and necessitated maternal guidance.

The mother was told that she could help the child solve the puzzles at any time and in any manner with which she felt comfortable. Prior to commencing the videotaping, mothers had the opportunity to practice the puzzle if they were unsure of the solution. There was no formal evaluation of efforts and no limit on time given to complete the puzzles. Since interactions while completing the second puzzle were to be analysed, videotaping of interactions on second puzzle lasted for at least 10 minutes. On completion, each child was rewarded with a chocolate bar. The interview and videotaping of puzzle completion ranged from 30 to 40 minutes.

#### Data processing

Videotapes of mother-child dyads completing the second puzzle were transcribed and a total of 10 minutes of interaction was coded at 60 second intervals. Indian language transcripts were translated into English, transcripts were cross-checked with the videotapes, and corrections were made as necessary.

#### Coding of mother-child interaction

Only maternal means and forms of guidance were coded as in this study we are most interested in other-regulation. Maternal task responsibility and regulation, as well as metacognitive content in verbal interaction, was coded.

#### Metacognitive responsibility or regulation

Successful completion of puzzle-solving tasks encompasses several steps. These include: a) selection of piece, b) selection of appropriate place, and c) placement of a piece in its location. The order of sequence is not fixed and may vary depending on the strategies chosen. On a difficult puzzle solving task, it is possible that the mother may take either responsibility in one or all of the above steps

or guide or prompt the child to do so. When the mother was performing any or all of the above steps without any reference made by the child, she was considered to be responsible (MR). On the other hand, if the mother either pointed, directed, named or cued the selection of pieces or places, she was considered to be regulating the child (MRC). Since we were interested in mothers' modelling successful strategic behaviours to children, the coding was limited to the steps or behaviours that led to successful placements. Behaviours related to dropping, fiddling, and unsuccessful placements were ignored.

#### Metacognitive content in verbalisations

In order to code the metacognitive content in interaction, verbalisations were divided into task relevant and irrelevant speech. Task relevant verbalisations were again divided into questions, directives, and single word utterances which serve the purposes of guiding / modelling the metacognitive processes. The content categories for metacognitive guidance were adopted from Freund (1990) and are as follows:

#### References to task-specific variables

Under this category, all references to puzzle pieces, descriptions, labels, and locations are included (eg., "It's a tail piece " or "That goes to the bottom" )

#### Reference to strategy-variables

Strategies related to associations between a place and piece (eg., " Find something for the corner"); matching properties of pieces (eg., "Are there other green pieces that go to bottom?"); knowledge of how pieces can be grouped (eg., Where can we keep part of this chick?") etc were included in this category.

#### References to planning, goals, and monitoring

This category included all verbalisations which specify a plan or sequence of activities (eg., "We will make chicken's head first and then the tail part"); Goal direction such as "Let's make the roof part of the house"; monitoring process like, "That doesn't go there").

#### Other form of speech

Attention - directing statements and single word utterances that encourage the child to participate or offer feedback fall into this category. Also certain verbalisations that can not go into any other category were also included (eg, ah!).

The chief investigator was the principal coder. An independent coder

randomly coded some of the transcripts to establish interrater consistency.

## Analyses

The forms and content of metacognitive guidance afforded to children in verbal interaction were analysed in terms of frequencies and proportions. Results are presented in both frequencies and proportions. Since the size of the sample is small, further statistical analyses were not conducted. The patterns in guidance were also delineated with a focus on the cultural meaning of actions.

## Results and discussion

The comparison of frequencies and mean proportional frequencies has yielded interesting differences in the forms and content of metacognitive guidance in interaction.

### Metacognitive responsibility or regulation

The comparison of cultural groups on MR and MRC categories has indicated that mothers in both cultures were more likely to assume responsibility for completing the puzzle (MR) than regulate the children's problem-solving (MRC).

However, mothers in two cultural groups seem to differ with respect to the amount of responsibility/regulation (MR/ MRC) taken in their children's problem-solving.

The variations in MR across cultures was found to be minimal. But with regard to MRC, the variations appear to be prominent.

The mean proportional frequencies of MRC in the Australian sample was

found to be higher ( $m=1.$ ) than in Indian sample ( $m=.15$ ) indicating less metacognitive regulation by the Indian mothers. The ratio of mean proportions of MR ( $m=1.30$ ) to MRC ( $m=.15$ ) within Indian sample also supported the contention that Indian mothers have taken more responsibility than regulation in their children's puzzle-solving.

The differences in MR/MRC across cultures can be attributed to several factors, the cultural attitudes to child-rearing and learning could be one among them. In Indian culture, it is the adult who exerts control and holds authority in several matters, whether it be planning or decision making. Adults act in a nurturing way and younger ones accept the commands of elder persons. The roots of this conventional practice can be traced to extended family structures in India, where coherence among family members is achieved through a hierarchical system of age. Elders have more formal authority, assume leadership and exert

greater control over younger ones. Adults are also expected to afford fullest protection, affection and indulgence in children's activities (Kakar, 1978).

Greater metacognitive responsibility taken by Indian mothers in their children's problem-solving may have been a reflection of the cultural practice, that perceives childhood as an age of dependence, which was also typified in the following example. In one incident, when the child said "Mummy I can't do it", mother was seen doing all the steps herself without questioning. This indicates that instead of delegating responsibility to the child, the mother has taken greater metacognitive responsibility. Further, the variations could also be due to the cultural interpretation of "adult guidance". Mothers would have interpreted guidance with a notion of taking responsibility.

Interview data collected on Indian mothers' attitudes to children's learning also supported this differences noticed above. Parents valued education, had high expectations of their children's education, and mentioned that they should support them to a great extent. Indian mothers also emphasised that children need guidance at every stage of their learning as they can not decide themselves the correct directions. Mothers reported that demonstration and observation techniques were the suitable learning styles for children. Australian mothers, in their interview, on the other hand, reported that they want to encourage self responsibility in children. Hands-on and discovery methods and active participation of the child in his or her learning were viewed as the appropriate learning modes for children. In one example, a mother was seen giving responsibility to her child (by saying "you do this bit alright!" or "for you this is what you have to do"). Australian mothers also mentioned that they foresee many opportunities for their children, and anticipated having a minimum intervention in their children's education and career decisions.

The other source of variation in MRC could be the differential experiences of Australian and Indian children in puzzle solving task. Indian children are familiar with puzzles, but have relatively limited access and spend less time on these tasks. Children of this age attend formal school and are more likely to be encouraged to do academic tasks by their parents. Since Indian children have comparatively less experience on puzzle solving, the mothers would have interpreted it as difficult and thus have taken greater responsibility in solving it. But, the differences in MRC that could arise due to differential cultural experience of the task were also controlled to some extent by giving practice sessions to mother-child dyads on the first puzzle. Finally, variations in guidance might be a function of cognitive competencies of children,

which were also controlled through selecting children of comparable

cognitive abilities.

### Metacognitive content in guidance

One of the mechanisms of other-regulation is verbal communication or speech offered in questions, directives or single-word utterances. Wertsch's (1979) observations revealed that mothers spend a great deal of time offering directives and questions, rather than elaborations or analyses on what strategies are appropriate in their communication to children. This particular pattern was apparent across cultures in the present study.

However, considerable differences were noticed with regard to speech categories used. Examination of speech categories revealed that Australian mothers asked more questions than did Indian mothers. On the contrary, Indian mothers offered more directives to their children. Disparities were also observed with respect to the utilisation of single-word utterances in two cultural groups.

Analysis of metacognitive content in maternal communication also indicated contrasts between sample. Comparison of mean proportions of frequencies have shown notable differences in task-specific content, monitoring statements and other forms of maternal speech. Australian mothers offered more task-relevant information ( $m=4.7$ ) than Indian mothers ( $m=3.5$ ). They have also monitored the children's responses more often ( $m=2.85$ ) than did Indian mothers ( $m=1.95$ ). With respect to giving feed back, or directing the attention of the child, variations were also noticed across sample ( Australian  $m=2.20$ ; Indian  $m=1.80$ ).

Differences were also apparent in the patterns by which task-specific content was offered. Australian mothers imparted task-specific content in the form of statements, while Indian mothers did in instructions. In monitoring the task behaviours of children, Australian mothers utilised more questions, where as Indian mothers used more statements.

Questions, and instructions serve different purposes namely viz., focus the child's attention on the task, direct the child towards the goal, monitor the steps, provide the planning. Wertsch (1979) indicated that adults would be more likely to use questions when they are giving children a larger share of metacognitive responsibility. Use of commands or instructions, on the contrary, mean that the child is left with minimum of metacognitive responsibility. The child simply needs to respond to each of the instructions in order to complete the task. Thus, the differential use of verbal directives across sample can be related to the differences in metacognitive responsibility taken by mothers.

Variations in speech categories and metacognitive content of mothers', may also be indicative of cultural attitudes. Information oriented speech in Australian mother-child dyads, with the greater use of questions may be reflection of Western cultural attitudes to children's participation and individual expressions. Use of instructions or directives in the Indian sample, in contrast, might be an indication of age hierarchies in adult-child communication. Indian mothers' speech to their children also had authoritative orientation. There were also expressions of anger when the child did not follow the mother's instructions. In one example, a mother was seen saying angrily to the

child not to touch the pieces or keep quiet.

The content of other-speech was also found to be different across cultures. The speech of Indian mothers' contained endearments and affective statements (like calling the child dear, sweetie, papa, talli [girls in telugu community are affectionately called as papa and talli]), while Australian mothers' speech comprised of mostly attention-directing statements and unelaborated feedback. Similar patterns were noticed in use of speech to infants in a cross-cultural study, where Japanese mothers used highest amounts of affect-salient speech than American mothers (Bornstein, Tal, Rahn, Galper'in, Lamour, Ogino, Pe^cheux, Azuma, & LeMonda, 1992). For directing the attention of children, Australian mothers used utterances like "look", "here" and so on. Attention-direction in Indian context was done through coaxing, scolding, and a specific non-verbal behaviour called "Knuckling" (patting on the head with a fist).

Indian mothers' speech to their children also comprised of social manners, values and motivational statements that reflect cultural specific socialisation practices. For example, when an Indian child refused to obey the instructions and talked rudely to her mother, mother was noticed explaining to the child that it was wrong to disobey and talk rudely to her. There was also insistence on using correct sitting posture for girls. In another example, mother was seen teaching the child to be persistent in achieving the goal.

Though non-verbal behaviours were not coded for analysis purposes, interesting differences in certain non-verbal behaviours were also observed. Australian mothers used more pointing gestures, while Indian mothers used head nods in their guidance. There was closer physical proximity and more contact between Indian mother-child dyads compared to Australian mother-child dyads. These Differences with regard to sitting postures were also noticed. Indian mother-child dyads were sitting in a specific posture called "Padmasana", (sitting on the ground, with the legs folded in towards and touching the opposite knees and with head and spine in an erect position). 'Padma' means lotus. Padmasana acquires its name because when performed this resembles a

lotus flower. This sitting posture was advocated traditionally in Telugu as well as in other Indian communities for Japa, Pranayama, Dharana (Retention or concentration), Dhyana (Meditation) and Samadhi (Self-realisation). Because of the perceived benefits of this posture for concentration and retention, children are traditionally encouraged to follow this posture in learning activities.

### Summary

Based on the sociocultural theoretical premises, the present study analysed the cultural patterns in the guidance of children's metacognitive learning. The data were based on the pilot work carried out with four mother-child dyads in Australian and Indian cultural communities. Interaction of mothers with their preschool children in puzzle solving were recorded and analysed for the patterns of metacognitive guidance. The results have indicated variations with regard to the forms and content of metacognitive guidance in verbal interaction. The study also pointed to possibility of wide differences in the use of non-verbal behaviours in puzzle-solving interactions.

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