
Contexts, Collaboration, and Cultural Tools: a sociocultural perspective on researching children's thinking^[1]

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ABSTRACT Sociocultural theorists recognise that cognition is not an individual construction, but is distributed across people as they participate in culturally relevant activities. Thus, rather than being a universal skill, thinking is very much contextually specific, guided by others, and mediated by particular cultural tools and artefacts. Yet there is a tendency in research focusing on cognition in young children to examine thinking and understanding as though they occur in a vacuum, separate from the kinds of activities, experiences, artefacts, and people in and with which they participate. This article, drawing on the work of Vygotsky, Rogoff, Wertsch, Göncü, John-Steiner, and others, will discuss how consideration of the important factors of contexts, collaboration, and cultural tools can present a far more dynamic and rich view of young children's thinking than some more traditional methods of research.

Introduction

Most of us in our profession are socialised into the mainstream research tradition of psychology and education in Europe and North America. We continue to work within this tradition as we formulate our research questions and develop appropriate methodology to address them. As part of this effort, we must also point out the limitations of mainstream research tradition and its need for expansion (Göncü, 1999).

Increasingly, there are researchers and academics who are highlighting what they see as some of the shortcomings of the dominant methods of research with young children. One of these limitations is the taken-for-granted nature of the universal development of all children. Rogoff (2003), for example, in her discussions of the cultural nature of human development, points out that the assumptions placed on chronological age and developmental milestones are often unquestioned by those who study human development. Yet issues of age transitions are themselves based on cultural perspectives (Rogoff, 2003). If, in research, we use the traditional Western-world approach that presupposes universals in terms of so-called developmental achievements, then we may immediately be positioning children whose life experiences fall outside the traditional, minority world as deficient, or we may overlook, dismiss, or criticise certain aspects of development, behaviour, experience, or thinking because it is not what we have expected (Robbins, 2002).

Göncü (1999) argues that in traditional or mainstream forms of research focusing on children there are a number of commonly held beliefs. These are that:

- there is a generic child, representing all children of the world;
- in most instances, especially in research on cognition, children are viewed and studied as individuals, without reference to interpersonal relationships;
- cause-and-effect associations between variables (often involving tasks unrelated to daily living) are of vital importance;

- reliance on inferential statistics is paramount, as this supposedly allows researchers to make generalisations from samples to populations (Göncü, 1999). (Indeed, Rogoff & Chavajay (1995) note that gaining expertise in statistics is regarded as a 'rite of passage' for novices entering the discipline of psychology.)

In addition, a number of authors, such as Graue & Walsh (1995), Rogoff & Chavajay (1995), and Göncü (1999), comment on the widely held proposition that thinking can be studied without attention being paid to children's participation and development within their contexts, communities, and cultural settings. However, as Rogoff & Chavajay (1995, p. 866) contend:

to understand individual thinking one needs to understand the social and cultural-historical contexts in which it is used. Researchers cannot just look at individual thinking in a vacuum, as though individual thinking is separate from the kinds of activities in which people engage and the kinds of institutions of which they are a part.

Yet these issues, and more, frequently remain unaddressed in research with young children, particularly research that examines children's thinking.

Dominant Approaches to Research on Thinking

Within the past 20 years much of the research that has been conducted into young children's thinking has been from the perspective of finding out their ideas in various areas of science and mathematics (see, for example, Osborne & Freyberg, 1985; Stepans & Kuehn, 1985; Jones & Lynch, 1987; Baxter, 1989; Dove, 1998; Ravanis & Bagakis, 1998; Sharp, 1999; Spiropoulou et al, 1999; Taiwo et al, 1999; Clarke et al, 2001). Perhaps it is because the focus has been on these curricular areas that the research methods used have tended to adopt a traditional 'scientific approach', following a style developed by Piaget in some of his earlier work, some 70 or 80 years ago (see, for example, Piaget, 1972, 1973).

In this work, Piaget pioneered the so-called 'clinical method' (Piaget, 1973), which was designed to determine how children's thinking develops over time. Essentially, it involved questioning children to discover how knowledge develops, how it changes, and what laws govern these changes (Bliss, 1993). In particular he was interested in the question of 'what conceptions of the world does the child naturally form at different stages of its development?' (Piaget, 1973, p. 13). Implicit in the approach was the supposition that the general course of development of intellectual structures is the same for all people (Wadsworth, 1989), regardless of where or how they live, and what is valued within their communities. Certainly, cultural variation was not of particular interest to Piaget (Rogoff, 2003).

Criticisms of Piaget's work are many and well documented (see, for example, Donaldson, 1978; Walkerdine, 1984; Bruner & Haste, 1987; Flear, 1992; Inagaki, 1992; O'Loughlin, 1992). However, it is important to recognise that many of his extensive ideas, written originally in French, are complex and difficult to understand, and have been subject to misinterpretation, omission, and oversimplification in translation (Flavell, 1977; Furth, 1981). For example, there is a commonly held belief that Piaget rejected the influence of social relationships on the development of cognition and that he preferred to see children as actively constructing their own understandings of the world in an independent manner. What tends to be overlooked is that he emphasised the role of conflict (arguing, disagreeing), especially between peers, in promoting cognitive development (Berk & Winsler, 1995).

Nevertheless, what appears to persist among many educators and researchers of young children is the notion that children should be viewed as 'individuals' who actively construct their own understandings of the world in a pre-determined, stage-like, universally applicable manner, independent of their contexts (see, for example, Bee, 1999; Berk, 2000). This view of children has endured not only in the areas of mathematics and science education research, but also within early childhood education, where it continues to be a major theoretical influence within many current research projects as well as teacher education courses and textbooks.

Perhaps, instead of the continuing censure of Piaget, criticism should be directed towards the generations of other researchers and academics who use his theory unquestioningly (for example apparently ignoring the fact that his ideas were derived from middle-class, European, early-

twentieth-century contexts which immediately risk positioning others as 'deficient' in their thinking). In doing so these academics have continued to *misinterpret* his theory (for example his alleged lack of any consideration of social relationships) and to *oversimplify* it (for example using his theory of stages of cognitive development in isolation from other ideas in his work). Yet it is these misreadings and overgeneralisations of Piaget's theory that have persisted, and remain influential in some areas of research with young children.

Thus, there are a number of issues associated with this mainstream research tradition that require reflection. The first of these is the apparently unquestioning manner in which many researchers rely on a misinterpretation of Piagetian theory. As Beilin (1992, p. 191) argues:

there are countless (ad nauseam) studies of conservation, the object concept, formal operational reasoning, training, and more, some of which continues. The negative consequence of this strategy has been a generally distorted picture of Piaget's theory that has hindered a full appreciation of the theory's potential contribution.

Beilin (1992) further notes that Piaget's research took a number of turns over his lifetime, and as his later books have only recently been translated and published it has become clear that his more recent work was quite different from his earlier 'standard' theory, and thus requires further consideration. He additionally contends that as research in neuroscience expands, some form of biologically oriented theory, as Piaget's is, will continue to hold relevance alongside contextualist ideas of development (Beilin, 1992).

A second significant issue requiring reflection is the reliance on a methodology that focuses on 'the individual' who passes through universal stages, thereby as a consequence potentially positioning some children from outside the 'typical' middle-class Western-world context as *lacking* in their learning and development. That is, there can be a tendency to dismiss certain ideas of children because they do not fit into preconceived categories about what we *expect* they will say, because their ideas seem *inadequate*, *untutored*, or *uninitiated* (as authors such as Hills [1989], Hodson [1998], and Taiwo et al [1999] state), or because they hold *misconceptions*, *alternative views*, or *naive ideas* (see, for example, Osborne, 1985; Stepan & Kuehn, 1985; Spiropoulou et al, 1999; Taiwo et al, 1999).

A third major issue with the dominant research methods is that children are frequently portrayed as anonymous and decontextualised. We appear to be amassing more and more data on what unidentified individuals and groups of children (often categorised according to their age and nationality) say in response to certain tasks which often bear little apparent likeness to these children's everyday lives. Yet little attention is paid to *why* they respond the way they do, the contexts in which they are members, the tools with which they are familiar (or not familiar), the interrelationships with others in their communities, and so on.

What often remain unasked are questions such as those identified by Göncü (1999, p. 13), as follows.

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

Sociocultural Perspectives on Thinking

Contrasting with the dominant Piagetian-inspired approaches is research using sociocultural theory, derived from the sociohistorical and cultural-historical work of Vygotsky and his Soviet colleagues (for example, Luria, Leont'ev, Gal'perin, Zinchenko, and other psychologists) in the early decades of the twentieth century (Davydov & Zinchenko, 1993; Wertsch et al, 1995; John-Steiner & Mahn, 1996). It is a philosophy in which attention is paid to specific social, cultural, and historical aspects of development (Daniels, 2001). In particular, emphasis is placed on relationships between people, contexts, actions, meanings, communities, and cultural histories (Edwards, 2000; Wertsch et al, 1995), as well as cultural tools and artefacts. Essentially, in differing from Piagetian theory:

the goal of a sociocultural approach is to explicate the relationships between human mental functioning, on the one hand, and the cultural, institutional, and historical situations in which this functioning occurs, on the other. (Wertsch et al, 1995, p. 3)

Sociocultural theorists therefore recognise that cognition is not an individual construction. Rather, it is a collaborative process that is intrinsically related to participation with others in socioculturally relevant activities. Cognition is distributed across people as they participate in culturally relevant activities, working with and transforming specific cultural tools and artefacts, practices, and contexts in which they engage (Rogoff & Chavajay, 1995). Thus, rather than being a universal skill, thinking is very much contextually specific, guided by others, and mediated by particular cultural tools and artefacts.

In researching children's thinking from a sociocultural perspective attention is focused well beyond the individual child. Indeed, Rogoff & Toma (1997) affirm that there is a growing consensus that cognition involves a collaborative process as people engage in thinking together with others. As individuals, their social partners, and contexts are all interdependent, and the development of individuals is intrinsically involved with participation with others in culturally relevant activities, practices, and institutions, in a mutually constituting relationship (Rogoff, 1998), sociocultural researchers are likely to be interested in how cognitive processes are *integrated with* rather than a *product of* sociocultural activities – a participation theory of development (Rogoff & Chavajay, 1995).

Instead of separating out individuals, others, and contexts and examining them as three separate entities, it can be far more informative to examine *sociocultural activity* as a unit of analysis, using Rogoff's (1995, 1997, 1998) three planes or foci of analysis. Here, the focus of analysis can be on the participation of individuals (personal focus of analysis), collaboration (interpersonal focus of analysis), or cultural/institutional/historical factors (community or contextual focus of analysis), *with any one of these being in focus, while the others remain in the background*. One cannot interpret or understand any of these without seeing how it fits into the ongoing activity. 'It is not as if the individual could be taken outside of the activity to have their development analysed. They are involved – part of the activity' (Rogoff, 1998, p. 688).

Contexts

Rogoff (2003) argues that:

people develop as participants in cultural communities. Their development can be understood only in light of the cultural practices and circumstances of their communities – which also change. (Rogoff, 2003, pp. 3-4; emphasis in the original)

As John-Steiner & Mahn (1996) explain, this feature sets sociocultural approaches apart from those arising from Piagetian perspectives, and has resulted in research which has examined the 'ways in which learning and teaching take place under different cultural circumstances and in different historical contexts, contributing to a *contextualised* rather than universalistic theory of development' (John-Steiner & Mahn, 1996, p. 197; emphasis in the original). As context is seen as integrated with the development of individuals, they are studied together, rather than as separate factors with one influencing or being influenced by the other.

It is important to note here the difference between cultural or cross-cultural studies and sociocultural research. In the former, attention is paid to how culture 'influences' the development of individuals, while in the latter the context is integrated and not seen as something that 'impacts on' development. Rather, from a sociocultural perspective, learning and development occur through a process of changing participation in dynamic cultural communities, in which there are active contributions from individuals, their social partners, practices, and traditions (current and historical), cultural tools, technologies, and materials, and values and belief systems (Rogoff, 1995, 2003). Individuals and their social partners and the activities in which they engage are continually transforming and developing in mutually integrated ways. Likewise, communities or contexts are constantly changing and being changed, which in turn results in changed opportunities for learning and development (John-Steiner & Mahn, 1996).

If one adopts this perspective there are a number of implications for research involving young children. These include careful consideration of the following kinds of issues.

- How is participation in particular contexts, with their own practices, traditions, philosophies, histories, values, belief systems, artefacts, and 'ways of behaving', integrated with children's learning and development? Is this being analysed as part of the research process?
- What are the taken-for-granted aspects of particular contexts that we no longer see?
- What is it that we expect to find in particular contexts – and will we be likely to label contexts or participants within the contexts as deficient if we do not see what we 'expect'?
- What are the everyday activities in which children participate within their communities? With whom and what do they participate within these activities?
- How do the context and activities that children are participating in differ from the planned or conducted research activity? How does the research context (for example, interview, observation) differ from children's everyday experiences?
- Are there particular contextual 'rules of engagement' that are taken for granted in the *research* activity?

As a result of consideration of these types of questions during all aspects of the research process (planning, design, data gathering, and analysis) contexts would be highlighted. Rather than children being essentially decontextualised and unidentified other than age and perhaps gender, aspects of their participation in community and cultural activities would be foregrounded. Particular attention would be paid to ways of behaving, values, histories, cultural/institutional practices, and artefacts within research and community (including home) contexts, and how these are integrated with their learning and development. Reflection on research traditions or 'ways of doing things' would occur, and careful attention would be paid to the selection of meaningful units of analysis for research activity. Researchers would examine their own assumptions, beliefs, and impressions about contexts in which they are conducting their investigations:

once we define children's development as a process of socialization into the existing system of meanings in their culture, the goal for research becomes one of understanding how children attain those meanings. We make an effort to achieve that understanding by considering the social and economic structure of each culture along with its goals for children's development, and the mechanisms by which children attain such goals. This requires identification of a unit of analysis for research that corresponds to a unit of meaning in children's lives as determined by members of the children's cultures. For us, cultural activity as a unit of life comprises the unit of meaning that children are expected to attain and therefore should be the unit of analysis for research. (Göncü, 1999, p. 12)

Collaboration

There is increasing agreement that cognition involves a collaborative process as people engage in thinking together with others (Rogoff & Toma, 1997). Therefore:

Qualitative changes in the social situation in which a child lives and acts lead to substantial changes in his [*sic*] mind, i.e., to its development. (Davydov & Zinchenko, 1993, p. 99)

For Vygotsky, there was a dynamic interdependence between social and individual processes. He argued that development was in fact the transformation of socially shared activities into internalised processes (John-Steiner & Mahn, 1996) – that development was at first an interpersonal, social activity, and later an intrapsychological process. All higher mental functioning of an individual, he believed, has its origins in social sources (Wertsch, 1991). John-Steiner & Mahn (1996) state that this internalisation is simultaneously an individual *and* a social process, and that by 'working with, through, and beyond what they have appropriated in social participation and then internalised, individuals coconstruct new knowledge' (John-Steiner & Mahn, 1996, p. 197).

In an attempt to explain how social and participatory learning occur, Vygotsky created his idea of the zone of proximal development (John-Steiner & Mahn, 1996). This can be defined as the dynamic region between the actual developmental level, or what a child can accomplish independently, and the level of potential development, or what the child can achieve with the assistance, guidance of, and collaboration with more capable peers or members of the community

(Vygotsky, 1978). Thus, 'human learning presupposes a specific social nature and a process by which children grow into the intellectual life of those around them' (Vygotsky, 1978, p. 88; emphasis in the original).

Rogoff (2003) acknowledges the importance of Vygotsky's ideas concerning the zone of proximal development, but argues that he appeared to focus on the type of interaction familiar to schooling and academic learning. She contends that parents frequently engage in conversations with their children which are aimed at providing access to information and engagement in the skills of their community (Rogoff, 2003). At other times children may observe other community members participating in particular tasks, and then become involved themselves. In attempting to include and *go beyond* the notion of interactions that are mainly instructional in intent, Rogoff (1995) uses the term *guided participation* to describe the varied means of mutual involvement, communication, and co-ordination of children and their partners as they participate in socioculturally relevant experiences:

In addition to instructional interactions, guided participation focuses on the side-by-side or distal arrangements in which children participate in the values, skills, and practices of their communities without intentional instruction or even necessarily being together at the same time. (Rogoff, 2003, p. 284)

Again, like earlier differences mentioned between cross-cultural and sociocultural studies, it is useful to consider how sociocultural theory differs from social 'add-on' and social constructivist theories. In these latter approaches the *individual* is considered as a unit of analysis, with the impact of *social 'influences'* on the learning and development of this individual being examined as though they are independent variables (John-Steiner & Mahn, 1996; Rogoff, 1998). Within sociocultural theory neither the individual nor others are entities separate from the activities and contexts in which they participate (the individual, social, and cultural processes constitute each other) – although they can variously become the focus of analysis (Rogoff, 1998):

in sociocultural views, individual development is seen as contributing to as well as constituted by the sociocultural activities in which people participate, whereas social influence approaches maintain a focus on the individual as the basic unit of analysis and examine the influence of 'outside' social forces. (Rogoff, 1998, p. 692)

For this reason, research involving children should also be focusing on collaboration with others, both proximal and distal (Rogoff's (1995, 1997, 1998) interpersonal focus of analysis). Issues to consider include the following.

- How are people engaging in shared endeavours?
- How are roles in activities being shared? Is there fluidity in roles?
- What is the nature of the interactions – guiding, leading, following...? Are there traditional or historical factors in these?
- What shared understandings and beliefs are being co-constructed, and meanings and perspectives being bridged? How are people collaborating and co-ordinating in doing this?
- Are the goals of collaborative activities (including research activities) the same for each participant? Are these goals being transformed in some way?
- Is there a power base within the relationships and where does this lie? Who or what is being privileged?
- What distal relationships (historical or physical) might exist and how are these a part of the activity?
- What structuring of children's opportunities is occurring that affords or does not afford participation in and observation of community activities?

Research activity that adopts a sociocultural perspective, therefore, would highlight the collaborative aspects of cognition. Attention would be paid to shared understandings, rather than simply focusing on individual constructions. These may include mutually constituted understandings within the context of the immediate community/institution, or beyond. For example, the understandings that are actively scaffolded at home would be acknowledged, and rather than dismissing certain ideas of children because they are deemed as *incorrect, unscientific,*

uninformed, or *wrong*, acknowledgement that these conceptions are being supported within the family contexts would be made.

Further, the researcher, herself, would be written into the data gathering and analysis. Rather than this being unacknowledged or considered neutral, attention would be paid to the reciprocity and negotiation of meanings between various participants (including the researcher) within the research activity, especially if that involves interviews or conversations with children. Consideration would also be given to the rich and collaborative exchanges that occur in conversations with children, rather than focusing on the first thing that they say, or on whether the responses to questions match the expected 'right' answer.

Cultural Tools

Another important concept within sociocultural theory, which we can highlight through Rogoff's (1995, 1998) contextual or community focus of analysis, is the use of cultural tools (both material and psychological) in the development of understanding. As Lemke (2001) points out, we grow and live within a range of different contexts, and our lives within these communities and institutions give us tools for making sense of, and to, those around us. Vygotsky described *psychological* tools as those that can be used to direct the mind and behaviour, while *technical* tools are used to bring about changes in other objects (Daniels, 2001). Commonly cited examples of cultural tools include language, different kinds of numbering and counting, writing schemes, mnemonic technical aids, algebraic symbol systems, art works, diagrams, maps, drawings, and all sorts of signs (John-Steiner & Mahn, 1996; Stetsenko, 1999).

An important characteristic of tools is that they do more than simply assist in the development of mental processes. They also essentially shape and transform them (Cole & Wertsch, 1996). According to Vygotsky, tools 'mediate social and individual functioning and connect the external and the internal, the social and the individual' (John-Steiner & Mahn, 1996, p. 236). As such they could appear to fit within an *internalisation* model of development, where children learn through knowledge passing through a boundary between the internal and external worlds.

However, from the perspective of a *participation* model of learning and development (see, for example, Rogoff, 1995, 1997, 2003), in which children learn and develop through their participation in the sociocultural activities of their communities, tools are not viewed as artefacts that connect the internal with the external. Tools cannot be separated from the activity in which they are embedded, from the thinking of the child, or from the meaning, purpose, relevance, and value being appropriated to them by the child and others. For example, while a child is drawing, she is using a number of different psychological and technical tools. She is manoeuvring a pencil (or stick, crayon, pen, or other implement) on a surface (paper, sand, clay, fabric), but at the same time she is utilising and manipulating personal experiences, images, and feelings, present, past, and possibly of the future. She is using knowledge and conceivably creating knowledge. There may be guidance (encouragement, support, modelling, direction, or even criticism) of others at the present time or during past drawing experiences. Perhaps problem solving regarding the type of drawing implement being used and the surface being drawn upon may be required. There may be an awareness on the part of the child of issues such as the value placed upon drawing within the community or institutional setting, and the 'accepted' way or style of drawing within that context, the purpose of that specific drawing experience, accompanying emotional responses, and so on. Therefore, it is almost impossible to be able to designate a boundary between the internal and external, or the social and individual, and even the technical tool and the psychological tool. As Matusov (1998) argues, within the participation model social and psychological planes mutually constitute each other and are inseparable from each other. Skills and functions are embedded in sociocultural activity.

Therefore, in sociocultural research activities it can be useful to consider the following.

- What cultural tools and artefacts are being used in the community or institution in which the research is taking place, and how are these being used?
- What affordances do these tools offer? What do they not offer?
- Are children being allowed access to these during the research process?

- What cultural tools are not available to them?
- What psychological tools are children using and how are these integrated with the activity in which children are participating?
- What unexpected tools, or use of artefacts, arise as part of the research activity?

Consequently, researchers would pay attention to tools, both physical and mental, and *how these are integrated with, structuring, and transforming thinking*. These tools might include not only those physically present, but also those which children have access to in other contexts, including books, paper, and pencils (or other culturally relevant drawing implements such as sand and sticks), television, computers, traditional and invented numerical systems, toys, and natural materials (stones, shells, seed pods), etc. Careful consideration would be given to the use of specific tools and artefacts within the research activity. For example, in interviews with children, opportunity might be provided for them to draw, physically demonstrate, dramatise, or even sing about their ideas – as well as for conversational exchanges. Researchers would develop awareness of the possible evidence of the use of mental tools by children – extended pausing, gesturing, and so on.

Conclusion

Research with young children and their thinking is an expanding endeavour. We continue to gain more knowledge of their ideas and concepts in a range of scientific and mathematical areas. The implementation of traditional Piagetian-inspired methods of data gathering and analysis has been useful for many decades. However, as Göncü (1999) has indicated, we must continue to question the limitations of the dominant research practices and seek ways to expand our research activities. Adopting a sociocultural approach can offer new and exciting understandings, highlighting how children are thinking, learning, developing, and changing *through participation in the sociocultural activities of their communities*. Instead of focusing primarily on the individual, sociocultural research can help us to understand the relationships between people, contexts, actions, meanings, tools, communities, and cultural histories (Wertsch et al, 1995; Edwards, 2000), and especially to understand the collaborative nature of cognition.

Rogoff's (1995, 1997, 1998) three foci of analysis (personal, interpersonal, and contextual) provide an innovative framework for studying children's conceptions of the world, broadening the focus of analysis from the individual to the social and community/institutional context, and the cultural tools and artefacts of specific communities in which these individuals are participating and their conceptions are embedded. Exciting new insights into the formation, scope, and richness of children's ideas become apparent: insights that are capable of taking us beyond our present understandings about young children's thinking.

Further, research practices that examine the taken-for-granted traditions of researching with young children can be helpful in providing new perceptions of children's *transformation of participation* in activities and the dynamic nature of their understandings, and thereby challenge what Göncü (1999, p. 4) describes as 'Mainstream Psychology's Universal Child'. Importantly, we can then foreground what is important for children's development from the viewpoint of *their* cultures, rather than what is 'deemed relevant and meaningful...by the developmental scientist' (Göncü, 1999, p. 7).

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Note

- [1] Parts of this paper relating to cultural tools are drawn and modified from an earlier paper written by the author entitled 'Thinking in a Vacuum versus Three Interrelated Stories: a sociocultural perspective on young children's thinking', presented at the 2002 International Education Research Conference of the Australian Association for Research in Education, Brisbane, 1-5 December.

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