ROUTLEDGE INTERNATIONAL HANDBOOKS

The Routledge International Handbook of Young Children's Thinking and Understanding

Edited by Sue Robson and Suzanne Flannery Quinn

THE ROUTLEDGE INTERNATIONAL HANDBOOK OF YOUNG CHILDREN'S THINKING AND UNDERSTANDING

This ground-breaking handbook provides a much-needed, contemporary and authoritative reference text on young children's thinking. The different perspectives represented in the 39 chapters contribute to a vibrant picture of young children, their ways of thinking and their efforts at understanding, constructing and navigating the world.

The Routledge International Handbook of Young Children's Thinking and Understanding brings together commissioned pieces by a range of hand-picked influential, international authors from a variety of disciplines who share a high public profile for their specific developments in the theories of children's thinking, learning and understanding.

The handbook is organised into four complementary parts:

- How can we think about young children's thinking? Concepts and contexts
- Knowing about the brain and knowing about the mind
- Making sense of the world
- Documenting and developing children's thinking.

Supported throughout with relevant research and case studies, this handbook is an international insight into the many ways there are to understand children and childhood paired with the knowledge that young children have a strong, vital and creative ability to think and to understand, and to create and contend with the world around them.

Sue Robson is Principal Lecturer and Subject Leader for Early Childhood Studies at Froebel College, University of Roehampton, UK.

Suzanne Flannery Quinn is Senior Lecturer in Early Childhood Studies at Froebel College, University of Roehampton, UK.

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Together with Elizabeth Coates he has been involved since September 2003 in an action research project which focuses upon young children, aged between 3 and 7 years, talking and drawing together. The data collected has resulted in a number of publications, conference papers and exhibitions, and work at present is examining the nature of young children's scribbling. Recent one-person exhibitions include in 2008, 'A Response to Primitivism – Particularly in Relation to the Drawings of Young Children' at the Alexandra Gallery, University of Cumbria, Lancaster, and in 2007, 'Children Also Have Artistic Ability and There is Wisdom in Their Having It (Paul Klee, 1912): An Exhibition of Constructions and Constructed Collages Informed by the Drawings of Young Children', at the Royal Birmingham Society of Artists Gallery, Birmingham, England.

Elizabeth Coates was an associate professor and Director of the Early Childhood Studies undergraduate programme at the University of Warwick, England. Since her retirement in 2013 she has been teaching part-time at the university on courses that include child development, education, and early years' policy and practice. During her time at Warwick she organised and directed five triennial international early years conferences and was founding editor of the *International Journal of Early Years Education*. Her background as an early years teacher has been a strong influence and, with Andrew Coates, she is involved in a longitudinal action research project focusing on young children (3 to 7 years) talking and drawing together. This has resulted in a number of conference papers and publications which include, among others, 'The Subjects and Meanings of Young Children's Drawings' in Dorothy Faulkner and Elizabeth Coates (eds) (2011) *Exploring Children's Creative Narratives* (Routledge, 2011).

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Rosemary Roberts works to support the development of resilient wellbeing through companionable learning. She has worked in nursery, primary and higher education, and in the voluntary sector; and was a founder director of Parents Early Education Partnership (PEEP) in the UK, working with Sure Start programmes in disadvantaged areas. She holds a postgraduate diploma from the Tavistock Clinic UK in Psychoanalytic Observational Studies, and a PhD for which she researched well-being development from birth to three in the home. In 2011 to 2012 she worked on various early years projects in Australia. She has written two books: *Self Esteem and Early Learning* (Sage, 3rd edn 2006) and *Wellbeing from Birth* (Sage, 2010).

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INTRODUCTION

The opportunity to look closely at young children's thinking and understanding is a sheer pleasure and a privilege. This handbook brings together researchers, theorists and practitioners from around the world, in an effort to represent some facets of that pleasure, and to provide a picture of current ideas and understandings. The handbook reflects the multi-disciplinary, multi-professional nature of work with and for young children. Authors here span (and cross) many disciplines and fields of study. All of them have their own histories, traditions and conventions, reflected in different ways of writing and talking about young children, and often different views about how young children's thinking develops and can be supported. The chapters collected here also represent a variety of different ways of thinking about thinking, reflecting the different interests and disciplines of the contributing authors. Some chapters report on research, others focus on reviews of extant literature, or engage in more theoretical analysis. In addition, the extent to which authors relate their ideas to how adults might support young children's thinking varies. What each chapter has in common is a focus on young people, from birth onwards, to about eight years of age, the period of life generally seen as 'early childhood'.

While there are some very distinct and different traditions represented here, there are also some important similarities that characterise the book as a whole, and these constitute a number of principal themes that run throughout the handbook. These include a view of children as both competent and skilful, a belief in the integrity of childhood as a time in its own right, and a sociocultural perspective on thinking that emphasises its development and display in social contexts.

First, and most importantly, is a view of young children as competent and skilful, with sophisticated capabilities as thinkers: 'rich in potential, strong, powerful, competent' (Malaguzzi, 1993: 10). While such a perspective may have its strongest roots in the sociology of childhood movement, much research (including that documented in this book) reflects a range of disciplinary perspectives that consider even the very

youngest children as capable constructors and creators of and within the world around them. This world involves an interconnected ecology of social relations as well as a terrain of objects (both natural and human-made) and ideas which are manipulated and used by all those, children and adults, who inhabit and navigate it together. Given the variability of the terrain, and the complexity of thinking as a tool for both construction and navigation of the world, this text intentionally incorporates multiple disciplinary and cross-disciplinary perspectives, which are characteristic of the field of early childhood studies. Authors here present often different ways of thinking about children's thinking and understanding, but each begins with the conviction, characteristic of the field as a whole, that young children have a strong, vital and creative ability to think and to understand, and to create and contend with the world around them.

Second, the work documented here reflects a view of the integrity of early childhood, as a time with its own rights and needs, rather than as merely a time of preparation for later life. Under the aegis of 'a positive agenda for rights in early childhood', the United Nations asserts that 'children, including the very youngest children, (should) be respected as persons in their own right' (United Nations, 2005: Section 5), and seen as social actors from the beginning of life. This rights-based perspective is based on the ethical stance that children are people who are young, and that being a young person is accorded with a sense of respect and understanding of youth. Such a perspective views children as neither objects of amusement, nor as (potential) social capital. The authors here put forward ideas about children's thinking and understanding that foreground a respect for the experiences and abilities of young people who are creating and navigating the world now.

At the same time, we are mindful of Kalliala's (2014) injunction that the idea of the child as 'competent social actor' should not be elevated to an 'ideal', if all it does is lead us to replace an old paradigm of the child as a 'fragile novice' (Sommer, 1999, cited in Kalliala, 2014: 4) with a new one, that of the child as resilient and *un*needful. This leads us to the third theme: that is, that children's development, and thus their thinking and understanding, occur within social contexts, in which all protagonists (children and adults) are interdependent, and dependent upon one another. This has a number of consequences. First, that much thinking, by both adults and children, is collective. Littleton and Mercer (2013) describe the process of thinking creatively and productively together as 'interthinking', which occurs, for Rogoff, in a process of 'guided participation in social activity with companions who support and stretch children's understanding of and skill in using the tools of a culture' (Rogoff, 1990: vii).

Such ideas owe much to the sociocultural perspective outlined first by Vygotsky (1978) and built upon by many writers and researchers since. A second consequence is that different social and cultural contexts will engender different and diverse ways of developing, dependent upon what is needed and valued (and thought about) within those contexts. As Hedegaard (2009) suggests, young children will be interacting with multiple cultural and social groups, experiencing continuously evolving cultural practices. A third consequence concerns the roles of adults, and the integral part they play in recognising, supporting and enabling children's thinking in these varied contexts.

In collating this handbook, we have tried to organise all the chapters into a meaningful whole. Each chapter, of course, has its own merits, and can be read independently of any other. However, influenced by Bruner's (1991) view of narrative as a sense-making act, we have attempted to create a series of narratives in the four parts here, with, we hope, chapters following one another in a way that enhances both understanding and enjoyment. Our choices are, though, our own, influenced by our own individual and collective thinking, and ways of making sense. They also changed often as the book progressed, and new chapters arrived, and each reader will create their own 'combinatorial flexibility' (Bruner *et al.*, 1976), taking ideas and information from chapters and putting them together in many different ways.

The handbook is organised in four complementary parts. In Part I, 'How can we think about young children's thinking? Concepts and contexts', the emphasis is on ideas and theories that we believe are fundamental to an understanding of the field. Reflecting the sociocultural theme of the handbook as a whole, chapters here look at children as social beings from birth onwards, and consider how they construct and negotiate the world as thinking beings with the tools of theorising, creativity, play, talking, questioning and wondering. This part also provides an opportunity to look afresh at some of the principal theorists, including Piaget and Vygotsky, and their continuing influence on theory, research and practice in the twenty-first century.

In Part II, 'Knowing about the brain and knowing about the mind', the emphasis is on both what babies and young children know about their own and others' minds, as well as what adults know about them. Current interest in young children's knowledge about the mind is reflected in very lively research agendas in all aspects. Carlson (2011), for example, identifies a five-fold increase in journal articles about executive function in childhood over the past ten years. With this heightened interest, we are keenly aware of the caution that is needed as we explore children's thinking. This section of the handbook includes contemporary thinking on a range of interconnected ideas that help us to gain a broader awareness of what is (possibly) happening when young people are thinking. The authors here recognise different ways of thinking, and take critical stances on issues which, in some instances, have become fragile discourses, such as 'school readiness' and the idea of 'critical periods'.

In Part III, 'Making sense of the world', authors focus on young children's efforts to make sense of their worlds, both in general, through the development of concepts and 'working theories' (Ministry of Education, New Zealand, 1996), and in some particular contexts, including astronomy, music and mathematics, technology, mark-making and narrative. Building on ideas first encountered in Part I, chapters here attest to the vital importance of play, particularly pretend play, and narrative of all kinds in supporting and extending young children's thinking.

The final part of the handbook, 'Documenting and developing children's thinking', considers some of the different ways in which we may potentially observe and document young children's thinking and understanding, and on the roles of adults and more experienced peers in their support and development. Throughout the handbook, the importance of hearing young children's own voices, and their thoughts about their experiences, has been emphasised. This theme, along with a number of others that run throughout the book, is returned to here. Authors provide

crucial reminders of the agency and capability of young children, the significance of play and narrative, and of the interrelationships between children's cognitive, social and emotional lives.

The different perspectives represented in the 39 chapters here contribute to a vibrant picture of young children, their ways of thinking and their efforts at understanding, constructing, and navigating their worlds. As befits an International Handbook such as this, authors come from around the world. We have tried to honour these different traditions and ways of writing about their work. Accordingly, the reader will find chapters that are structured very differently, as well as written in both 'English' and 'American' English. These multiple diversities contribute to the richness of the book. There are many ways to understand children and childhood (Dahlberg *et al.*, 2007): we hope that the chapters here contribute to such understanding in readers.

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PART I

How can we think about young children's thinking? Concepts and contexts

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1

THE INFANT'S CREATIVE VITALITY, IN PROJECTS OF SELF-DISCOVERY AND SHARED MEANING

How they anticipate school, and make it fruitful

Colwyn Trevarthen and Jonathan Delafield-Butt

Introduction

This chapter presents the child as a creature born with the spirit of an inquisitive and creative human being, seeking understanding of what to do with body and mind in a world of invented possibilities. He or she is intuitively sociable, seeking affectionate relations with companions who are willing to share the pleasure and adventure of doing and knowing with 'human sense'. Recent research traces signs of the child's impulses and feelings from before birth, and follows their efforts to master experience through stages of self-creating in enjoyable and hopeful companionship. Sensitive timing of rhythms in action and playful invention show age-related advances of creative vitality as the body and brain grow. Much of shared meaning is understood and played with before a child can benefit from school instruction in a prescribed curriculum of the proper ways to use elaborate symbolic conventions. We begin with the theory of James Mark Baldwin, who observed that infants and young children are instinctive experimenters, repeating experience by imitating their own as well as others' actions, accommodating to the resources of the shared world and assimilating new experiences as learned ideas for action. We develop a theory of the child's contribution to cultural learning that may be used to guide practice in early education and care of children in their families and communities and in artificially planned and technically structured modern worlds of bewildering diversity.

Cycles in moving and learning of the human spirit

In 1894 Baldwin published his seminal thesis on psychological development of the infant. He studied the motor development of children to discover the origin of intelligence, and his attention was attracted to the repetition of actions, most obvious at first in limb movements of the young infant, but true of all the infant's actions, including looking movements of the head and eyes, touching with the hands, and vocalising. He termed this tendency for moving and sensing to repeat itself the 'circular reaction':

> the self-repeating or 'circular' reaction … is seen to be fundamental and to remain the same, as far as structure is concerned, for all motor activity whatever: the only difference between higher and lower function being, that in the higher, certain accumulated adaptations have in time so come to overlie the original reaction, that the conscious state which accompanies it seems to differ *per se* from the crude imitative consciousness in which it had its beginning.
>
> *(Baldwin, 1894, p. 23)*

Baldwin claimed that the tendency for an action to be repeated expresses an invariant principle of organisation within human psychological development, which persists in behaviours at every degree of complexity. Baldwin's circular reactions were the forerunner of Jean Piaget's sensorimotor and cognitive 'schemas' (Piaget, 1962). Both conceived the developing mind as generated in embodied movement. Higher mental functions emerge as abstractions from earlier sensorimotor experience, and are therefore structured by the same principles. Repetition observed in early motor action in infancy, develops into repetition in complex and abstract cognitive thought process in later childhood and adult life. The invariant feature is the tendency for an act, in real movement or in thought, to repeat itself, and for the plan of successfully accomplished acts to be retained and developed through further repetition with variation.

The idea has become a core principle of preschool education theory, originating from the understanding of early childhood gained by the revolutionary educators Comenius, Pestalozzi and Froebel (Athey, 1990; Bruce, 2012). But attention only to object use is insufficient to understand the way a young child learns meanings in human company (Donaldson, 1978). A young child's action is to be understood in the context of innate capacities for signalling intentions, feelings and experiences to communicate about a shared world, first with parents and family, and then with assistance from companions and teachers in an expanding community (Whalley *et al.*, 2007). The circular reactions of intelligence must be expectant of experiences in relationships, with different degrees of intimacy and reliability.

Baldwin was aware that social collaboration in the making of shared meaning needs circular reactions between the intentions of individuals. He observed the growth of the young child's self-awareness in engagement with other persons, and their readiness to learn from individuals by attending to the different purposes of their actions. He saw that the principles of repetition in action – 'accommodation' to new

circumstances in awareness enabling creative novelty, and 'assimilation' of successful experience to guide further actions – also regulate and elaborate social habits. He was as interested in changing sociological theory as in advancing developmental psychology in a science of the 'child and the race'. These ideas influenced George Herbert Mead's sociological theory of the development of a social 'Me' (Mead, 1934) and Jerome Bruner's psychological theory of development within 'the culture of education' (Bruner, 1996). We are built from the start to be attuned social creatures seeking engagement with initiatives and knowledge of other humans. That is how all our cultural habits and achievements are made (Trevarthen and Delafield-Butt, 2013; Trevarthen *et al.*, 2014).

The innate rhythms of experience in the time of action

The existence of a 'motor image' formed in the mind, one that anticipates and organises bio-mechanical effects of moving, in the body and in engagement with objects, was firmly established in the 1920s by a young Russian neurophysiologist, Nikolai Bernstein (1967), who used examination of film to accurately trace the regulation of forces in the moving body of a tool-user, a runner, or a child learning to walk. He analysed how the many motor components of any body action are assembled by the dynamic *motor image* formed in the brain into a coherent, intended movement, which is highly efficient, wasting almost no energy. Bernstein noted that well-done movements are always rhythmic, smoothing out the irregular inertial forces they master through planned steps of time. This power of the brain to integrate its activities in coherent rhythmic patterns is recognised in the philosophy of phenomenology, which admits that motility and consciousness express the brain-generated 'subjective' time of intentional doing and thinking (Merleau-Ponty, 1962; Goodrich, 2010). We share an inborn sense of time, and this makes shared doing and thinking or shared meaning possible (Trevarthen and Delafield-Butt, 2013).

The developmental psychobiology of sensorimotor learning

Two lines of research in the last four decades have brought new evidence confirming the generative power of human motives and their timing in self-discovery, and in regulation of relationships.

Careful attention with the aid of film and video recording technology to the capacities and needs of newborns, including those born up to three months before term, has brought to light an intelligence that is expressive in human ways and highly sensitive to the pulse and qualities of human expression, and their tendency to compose narrations (Trevarthen, 2011a). Developments of sensorimotor intelligence in the first three months lead the infant to be a skilled performer in a 'musicality' of companionship with a willing partner (Malloch, 1999; Malloch and Trevarthen, 2009). In every human community babies three to four months old begin to enjoy participating in the rituals of traditional action games or baby songs

(Trevarthen, 1999, 2006, 2008; Gratier and Trevarthen, 2008; Ekerdal and Merker, 2009) (see Figure 1.4).

Newborn infants less than a week old respond to the expressions of other persons and use the imitated actions to establish a dialogue of purposes and experiences (Nagy, 2011). However, in spite of controlled studies by Maratos, Meltzoff, Heimann and others that prove the infants can imitate, this is a highly controversial area of research, because the findings contradict long-held beliefs and rational arguments that an infant can have no intentional self that is conscious of an outside reality for weeks or months after birth, and no ability to perceive the actions of another person as like those of a self (Kugiumtzakis and Trevarthen, 2014).

Detailed study of videos of interactions with full-term and premature infants in the first days after birth shows a baby can focus attention and imitate movements of head, eyes, and mouth, with parts of their own body they cannot see, and even try to imitate simple sequences of vocal utterances (Figure 1.1). Emese Nagy with Peter Molnár (2004) made an important modification of the testing procedure by waiting for a few seconds after the newborn infant has imitated her, which evokes a repetition of the imitated act by the baby as a 'provocation' for a response from the adult. Concurrent recording of heart rate changes showed that while 'imitation' is associated with effort signalled by heartbeat acceleration, 'provocation' is accompanied by a slowing of the heart, indicative of focused attention for a response.

Imitations of a newborn infant are the product of nine months of development in brain and body. Research tracing the first stages of the conception of a human being reveals a time-regulated process of collaboration between living elements (Delafield-Butt and Trevarthen, 2013).

The human foetus at eight weeks has distinctive body form with adaptations of hands, hearing organs, eyes, mouth and vocal organs that show anticipation of a life in conversation (Trevarthen, 2001). At this stage the subcortical brain, that will be the integrator of intrinsic motives for sensory-motor functions of the whole, and for emotional appraisal of objects of action is forming in close relation to the systems that regulate hormonal functions of the vital self:

> The first integrative pathways of the brain are in the core of the brain stem and midbrain, and the earliest whole body movements, though undifferentiated in their goals, are coherent and rhythmic in time. When sensory input develops, there is evidence, not just of reflex *response* to stimuli, but of the *intrinsic generation of prospective control* of more individuated actions, before the neocortex is functional. In the third trimester of gestation, when the cerebral neocortex is beginning formation of functional networks, movements show guidance by touch, by taste and by responses to the sounds of the mother's voice, with learning.
>
> *(Delafield-Butt and Trevarthen, 2013, p. 205)*

The origin of the mental life of a child is identified at this time, at 50 days' gestational age, as the integrated neuromotor system enacts the first spontaneous circular reactions of the organism (Delafield-Butt and Gangopadhyay, 2013). Movies made

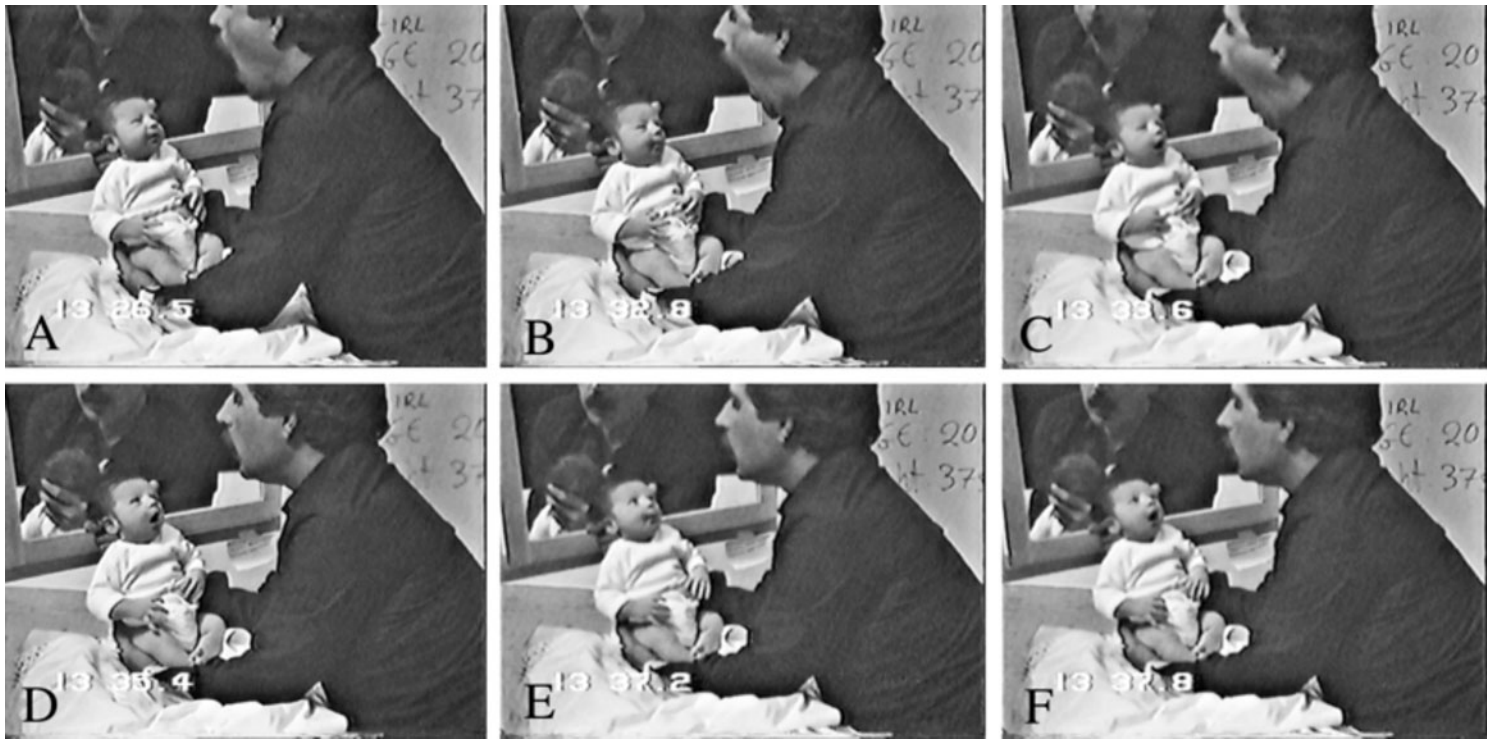


Figure 1.1 A cycle of imitations of Mouth Opening with a female infant 20 minutes after birth. Recorded at a maternity hospital in Herakleion, Crete in 1983 by Giannis Kugiumutzakis for his PhD research at the University of Uppsala (Kugiumutzakis and Trevarthen, 2014). A (0 sec.) The researcher presents a wide open mouth for the first time to the attentive infant, focusing on his mouth, and with slightly closed eyes and pursed mouth. B (6.3 sec.) The researcher opens his mouth for the fourth time. The neonate continues to observe his mouth with evident interest. The right hand moves up. C (11.1 sec.) The researcher opens his mouth for the fifth time. The neonate imitates him once, synchronously while watching his mouth. The right hand closes. D (12.9 sec.) The infant imitates a second time, looking up at the researcher's eyes as he waits. E (14.7 sec.) Both pause, waiting. The infant is still looking at his eyes. F (15.3 sec.) The infant makes a third large imitation while looking at the researcher's mouth.

by ultrasound, which enable sight of the foetus alive in the mother's body and the measurement of activities, confirm that from mid-gestation limb movements of the foetus are purposefully guided, anticipating sensory feedback, and experimenting with it. These self-regulating movements not only show differences of vitality that identify different foetuses as more or less animated personalities, even in 'identical' twins (Piontelli, 2010). They also reveal a special sensibility for the presence of an 'other', reaching and touching with special care towards a twin. Facial expressions show that the foetuses have emotions of pleasure in appreciation of 'good' tastes or physical sensations, and of anxiety or disgust for 'bad' experiences. Hearing develops in the last months and the mother's distinctive voice is recognised by the newborn to identify her as a preferred partner. This helps the baby learn her face in the first days.

New brain science of shared intentions

Perceiving the intentions in others' actions is now shown to be mediated directly by neural resonance, or 'mirroring' (Gallese *et al.*, 1996), but the process is not an automatic reflection: it requires persons to receive and take up one another's purposes. It demonstrates reciprocal inter-subjective and sympathetic engagement with mutual accommodation of actions and emotions (Ammaniti and Gallese, 2014). This is how experiences of the world can be assimilated into a common 'human sense' of meanings (Donaldson, 1978). Mutual learning by accommodation, and the playful assimilation of rhythmic game routines, are enacted in facial expressions and vocal utterances, and in the 'vitality dynamics' or 'musicality' of repetitive actions of the whole body (Malloch and Trevarthen, 2009; Stern, 2010; Trevarthen and Delafield-Butt, 2013).

Humberto Maturana has called the spontaneous need of a human organism to move in creative, expectant ways that express ideas of being in the world 'languaging' (Maturana *et al.*, 1995). The reactions of a newborn to affectionate and playful attentions of a companion indicate that there is a specific readiness for languaging in movements that have the power to 'make sense' for others, without words. We can see this in a picture of a newborn engaging with attentive others with the emphasised expressions in attitude and gestures of an orator, or critic (Figure 1.2). The cerebral hemispheres develop complementary ways of taking care of inner life functions with the help of maternal care, and seeking adventures in discovery of the resources of an external world (Trevarthen, 2001; Trevarthen *et al.*, 2006). This is shown by the ways a newborn baby's hands move. Commonly the right hand projects outward 'declarative' gestures while the left is more directed to the body.

Emergence of learning in companionship

Infants are born at a fragile stage of life when the body is adapting to a new world and brain is growing rapidly (Nagy, 2011). They need support, protection and nourishment and are adapted to stimulate a mother's care. A mother who is

Figure 1.2 A 4-day-old girl intently regards her grandmother, who is speaking to her, using an expressive body, with an attentive mouth and asymmetric hand gestures, 'languaging'.

emotionally depressed, anxious and inattentive to her infant will have difficulty holding her baby's attention, and the baby may be avoidant and even become depressed as well. Crucial help can come from others who offer care, and the baby will respond (Narvaez *et al*., 2012). We know that the quality of early care matters for future self-confidence and learning, and the infant has ways of expression that reinforces an affectionate personal relationship. In 'bonds' of mutual trust with favoured companions, shared repertoires of expressive tricks and exchanges of feeling are discovered that nourish the infant's vitality and imagination (Stern, 1995, 2000; Trevarthen, 2009, 2012a, 2013a).

The intensity of interest and the delicacy of response of young babies to persons who speak to them reinforces an affectionate personal relationship, which has great importance in the baby's wellbeing and mental development. In the 'bond' that develops between them, infant and favourite companion cultivate this shared repertoire of expressive tricks and exchanges of feeling.

Microanalysis of ordinary face-to-face play between parents and young babies confirms a precise *timing* in the way they address one another and reply. The infant stimulates an adult to use a gentle and questioning *infant directed speech*, 'motherese' or 'baby talk', that has a regular beat and characteristic expressions of mood in its

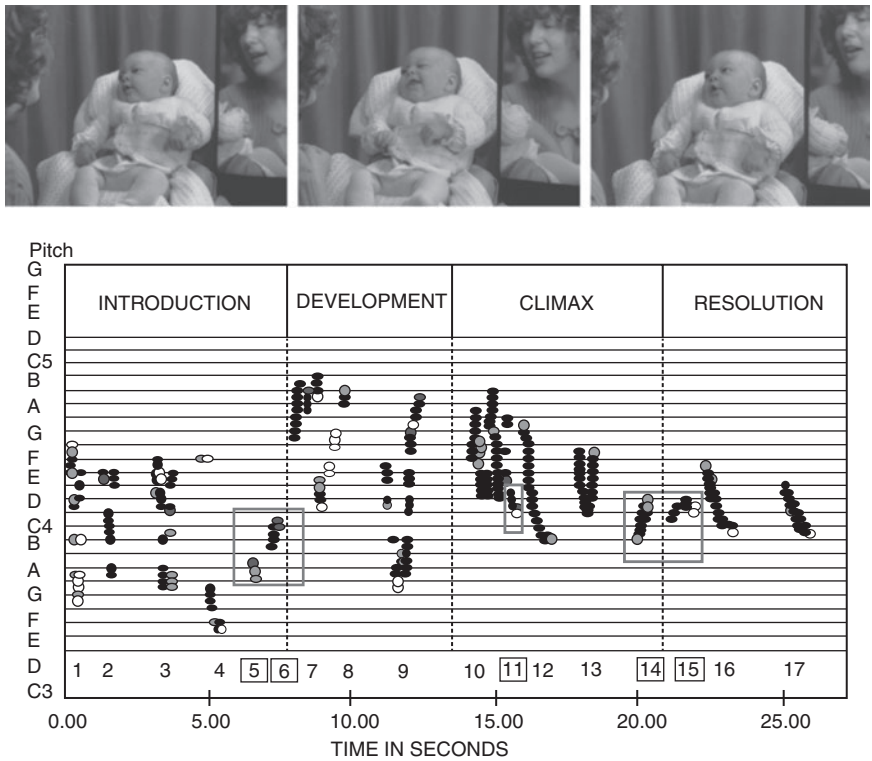
changing intonation, rhythm, and in the accompaniment of movements of head, eyebrows, eyes, and hands. The infant listens and watches the affectionate and playful display intently, and then makes a reply – on the beat, with a smile, and with head and body movements, cooing, hand movements, and lip-and-tongue movements of *pre-speech*. The attempts at vocal expression are synchronised with delicate hand gestures, as in adult conversation. In collaboration with the parent, infants make rudimentary 'utterances' that form *phrases* of two or three seconds, and that are organised in *narratives* of expressed excitement with characteristic phases of 'introduction', 'development', 'climax', and 'resolution', typically lasting around 30 seconds. The enjoyment parent and child have in extended 'protoconversations' demonstrates a state of 'primary intersubjectivity' or dynamic interpersonal awareness that allows mutual regulation of feelings and motives (Trevarthen and Delafield-Butt, 2013) (Figure 1.3).

Analysis of vocal exchanges in protoconversation by acoustic techniques shows that the timing, rhythms, pitch modulations and quality of sound expressions constitute a 'communicative musicality' (Malloch, 1999; Malloch and Trevarthen, 2009), and tests of young infants' preferences and capacities to discriminate sounds show that they hear musical melodies, harmonies, rhythms, and accents, in both vocal and instrumental sound. These sensibilities are particularly adapted to hear the melody of emotions and states of animation in the human voice, especially the mother's.

How games with mother lead to sharing of tasks, tools and words, artefacts of a 'proto-habitus'

In 1974, Penelope Hubley, in PhD research at Edinburgh University, made an observation that led to new understanding of how shared understanding of using and naming objects begins. She was studying films of communication between an infant girl, Tracy, and her mother from three weeks after birth (Trevarthen and Hubley, 1978). She observed a first protoconversation at four weeks, and paid particular attention to the development of play from three months when the baby began to use her hands for grasping and manipulating objects. After five months games developed as her mother teased Tracy's interests in entertaining ways. The teasing became reciprocated, Tracy acting in provocative uncompliant ways for fun. This is how infants get to know minds better (Reddy, 2008). They played 'person-person' games with one another's movements, of face, hands and voice, then after seven months games were played with objects that the mother moved to attract Tracy's interest and participation. Tracy practised 'secondary circular reactions', shaking and banging objects she was holding, and she watched when her mother joined the rhythmic game with her expressions. The object, or its use by Tracy to 'move' her mother, became a mediator in shared interest and action, animated by Tracy's clear expressions of pleasure, puzzlement, etc.

As Tracy's two-handed play developed, the games with her mother became more elaborate and protracted. Then, at 40 weeks, for the first time Tracy acknowledged her mother's initiative in a new way, seeking to understand what new intention was offered. They began to share intentions in a task in what we called 'secondary



INTRODUCTION	DEVELOPMENT	CLIMAX	RESOLUTION
1 Come on 2 Again 3 Come on then 4 That's clever 5 INFANT 6 INFANT	7 Oh yes! 8 Is that right? 9 Well tell me some more then	10 Tell me some more then 11 INFANT 12 Ooorrh 13 Come on 14 Ch ch ch ch With INFANT	15 Ch ch With INFANT 11 Ahgoo 17 Goo

Figure 1.3 Proto conversations with a 6-week-old, showing mutual attention between infant and mother, the pitch plot of the narrative showing how the voices move in the octave above middle C (C4), and the verbal utterances of the mother. The infant's vocalisations are enclosed in boxes (Malloch and Trevarthen, 2009; Trevarthen and Delafield-Butt, 2013).

intersubjectivity', person-person-object cooperation, and Tracy's new willingness to become a partner greatly changed how her mother communicated. As they efficiently 'worked' in joint tasks, performing complimentary steps, her mother's 'directives' by speech and gesture took over from playful 'reactive' imitations of sounds and actions.

Hubley followed this with a study of five girls, making films at two-week intervals when the infants were 34 to 54 weeks of age (Hubley and Trevarthen, 1979). All

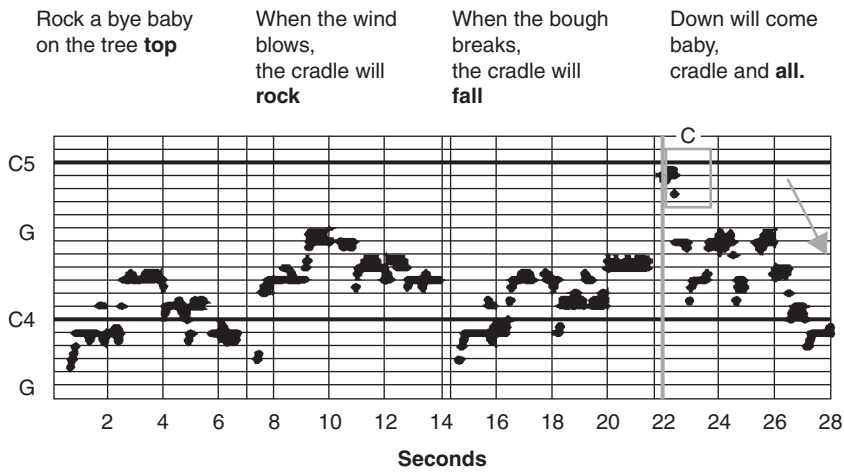
subjects changed in their willingness to follow directives of their mothers from 46 weeks and by the end of their first year were learning new purposeful acts from their mothers' example, including some words. They were mastering Michael Halliday's 'proto-language' of gesture and vocalisation (Halliday, 1979). We identified the infant as the motivator of the important development in companionship:

> Our work leads us to suggest that at the end of the first year our subjects had become pupils by some positive genesis of an adaptive function essential to being human. They could then gain understanding not only through their own activity, but also from another person by imitating, and even more powerfully by the more complex tactics of cooperation that provoke assistance and instruction.
>
> *(Hubley and Trevarthen, 1979, p. 74)*

The chart of changing motives for shared experience through infancy, and how toddlers make meaning in their world

Research on the development of communication with infants, which was recorded in three multi-disciplinary volumes in the 1970s (Schaffer, 1977; Lock, 1978; Bullowa, 1979), revealed stages by which innate capacities for action-with-awareness and communication are elaborated, from the subtle two-way imitations of expressions by newborns with mother and father to the acquisition of speech. We defined age-related changes in infants' motives for learning by their own efforts and in communication with familiar companions and we found strong relationships between the ages of change and developments in the body and brain (Trevarthen, 2001; Trevarthen and Aitken, 2003). The most conspicuous changes were the development of protoconversations at two months (Figure 1.3), a period when the narratives of rhythmic action games and baby songs were enjoyed in months four to eight (Figure 1.4), and the change to cooperative use of objects and significant actions at nine months.

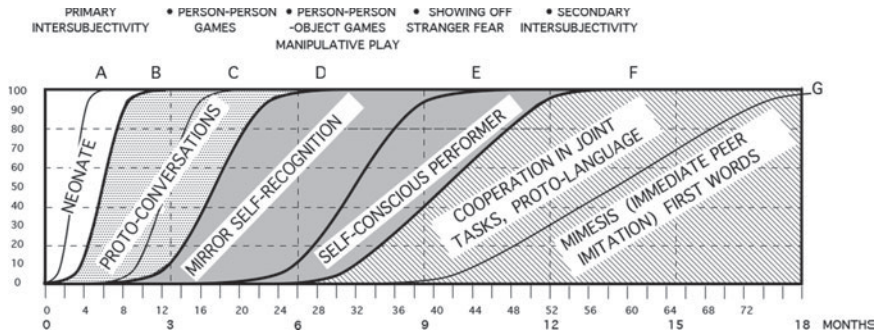
After the 18 months of infancy, the body becomes very mobile and the toddler seeks wider social relations. Creativity within the experience of the repetitive act, discovering how, in communication, each repeated act is a newly created expression and will carry with it some degree of creative novelty or playfulness, is particularly strong in exuberant activities of young children, before school, and remains so for exceptionally creative adults (Bruce, 2001; Bateson and Martin, 2013; Trevarthen, 2014). In play, repetition in the interpersonal dialogic cycle promotes the generation of understanding and the creation of new meanings with sociocultural value, and these become part of an endlessly inventive tradition of storytelling (Bruner, 1990). Each new expression offered in exchange contains within it reference to the utterance that came before it, from the other person. Next it may be assimilated with all the associations, motivations, playful novelty, and intentional aspirations of the listener or watcher, who will reply by speaking or by doing a responsive action. Thus dialogue creates new meaning.



Clappa, clappa handies
Mommy's at the **well,**
Daddy's away to Hamilton
To buy wee Emma a **bell.**

Round and round the gar-den
Ran the ted-dy **bear,**
One step. two step,
And a tickly un-der **there**.

Figure 1.4 English baby songs show the universal structure, with groups of four lines, making verses each of which is a narrative that lasts around 25 to 30 seconds. The rhythm is 'iambic' with alternating accented and unaccented syllables, and commonly there is rhyming of words at the ends of the lines. The infants attend and react in time with the song. Many songs are accompanied by ritual body games, and in 'Clappa-clappa-handies', and 'Round-and-round-the-garden' shown. 'Rock-a-bye baby' is a lullaby, sung slowly. The lines make up a four-part narrative (Trevarthen and Delafield-Butt, 2013).



Key developmental changes		
	Behaviour and motor activities	**Communication**
A (3):	Regulations of sleep, feeding and breathing. Innate 'pre-reaching'.	Imitation of expressions. Smiles to voice.
B (5):	Pre-reaching declines. Swipes and grabs.	Fixates eyes with smiling. Proto-conversations. Mouth and tongue imitations. Distressed by 'still-face' test.
C (12):	Smooth visual tracking, with strong head support. Reaching and catching.	'Person-person' games, mirror recognition.
D (16):	Interest in surroundings increases. Accurate reach and grasp. Binocular stereopsis. Manipulative play with objects.	Imitation of clapping and pointing. 'Person-person-object' games.
E (32):	Babbling. Persistent manipulation, rhythmic banging of objects. Crawling and sitting, pulling up to stand.	Playful, self-aware imitating. Showing off. 'Stranger fear'.
F (42):	Combines objects, 'executive thinking'. Categorises experiences. Walking.	Declarations with 'joint attention'. Protolanguage. Clowning.
G (60):	Self-feeding with hand.	Mimesis of purposeful actions, uses 'tools' and cultural learning. Imitates first words.

Figure 1.5 Age-related changes in the abilities of infants that prepare the way for language and learning of culturally significant skills.

Two artists, a poet and a musician, praised the powers of sociable invention by young children. Both became investigative psychologists. The Russian poet and cultural activist Kornei Chukovsky, who became the most famous children's poet in Russia, had discovered, when he listened to young children playing where he was writing, that between two and five years children are 'linguistic geniuses', inventive and sensitive to the poetic resources of their talk in play (Chukovsky, 1968). Professor of

Musicology Jon-Roar Bjørkvold, in his *The Muse Within* (1996), similarly reports discovering the inventiveness of 'children's musical culture' when he studied material he had collected in Russia, the United States and Norway.

Baldwin's principle of psychological development as circular repetition reminds us that creative novelty is present in every new act, and the rhythms, feelings, and interests in engagement with the world are adapted to be shared between persons. Successful and rewarding experiences are repeated with playful variation. Appreciation of the child's contribution to the discovery of meaning by collaboration with companions in imitation supports a more generous, more creative, more enjoyable, and more fruitful, practice of education at all later stages (Whitehead, 1929; Malaguzzi, 1993; Bruner, 1996; Hurst, 1997; Donaldson, 1992; Rogoff, 2003; Trevarthen, 2011b, 2012b, 2013a, b). This practice must be more than childcare by staff occupied with protecting babies and toddlers while mothers are at work. It needs specially trained teachers who appreciate the changing abilities of young children for active learning in rich environments that favour creative collaboration with companions of all ages, who know that children respond to exploration with the natural world, who involve parents in their children's learning, and who do not impose formal primary school instruction too early. Life-readiness is already rich before school-readiness is required.

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2

'I WONDER WHY OUR DOG HAS BEEN SO NAUGHTY?'

Thinking differently from the perspective of play

Elizabeth Wood

Introduction

The aim of this chapter is to contrast two strands of research on young children's thinking and understanding. The first strand focuses on the forms of thinking that are considered valuable in the context of 'educational play', that is, play that is planned to support children's learning and development in relation to curriculum goals. The second, and more substantial, focus is on the forms of thinking that children have to master in order to be in a state of play, that is, to act in and on the world from the perspective that 'this is play'. Although these two strands have points of intersection, a critical distinction is that children's thinking in play is not directed towards accomplishing or demonstrating adults' purposes or curriculum goals, but is shaped by the 'what if' and 'as if' qualities that mark the essence, spirit and flow of their play.

This distinction between 'educational' and freely chosen play creates some of the tensions that exist regarding the ways in which play is constructed and enacted in early childhood settings. This is because the discourses of quality and effectiveness that circulate in national and international contexts tend to value the outcomes that are inscribed in policy frameworks and are expressed as curriculum-based knowledge or learning standards. Although it is frequently claimed that play is the natural, spontaneous and optimal way of learning for young children, the developmental and educational discourse has focused on proving the purposes that play serves for social, physical, cognitive and behavioural outcomes. In contrast, the purpose of this chapter is to argue that play enables children to think and act differently from the perspective of play. Freely chosen play, humour and playfulness enable children to demonstrate metacognitive and metacommunicative skills, but the spontaneous

application of those skills is directed towards their intrinsically motivated activities and purposes.

The title of this chapter comes from an episode of play recorded by Cook (2003) in a nine-month study of four children, aged 4–5 years (two boys and two girls) in a Foundation Stage class in England. Alice, Lucy and Richard are playing in the role-play area, designed around the theme of 'Hogwarts' – the school for wizards in the Harry Potter stories by J.K. Rowling. They have access to a range of resources that reflect this theme (wands, books of spells, and 'magic potions' – bottles of coloured water), as well as the everyday home corner resources, such as kitchen equipment. One child is the dog 'in his kennel' and two more boys join them as dogs. SG denotes Small Group, Cb denotes boy, and Cg girl.

Alice: *He's in his kennel … Hey Lucy, he's going to come out. Hey, come on dog, wake up.*
Alice assigns roles: *You're Hermione and I'm Hermione's mum, and Richard is Hermione's dad.*
I wonder why our dog has been so naughty.
(To two boys) *You two play about and eat sweets as bones. I need a doll.*

The boys play in role, hiding bones in the washing machine. Then Richard decides to join them as a dog, not as the dad, which gives rise to some renegotiation of roles:

Lucy: *Richard's turned into a dog.*
Alice–Lucy: *But he can't.*
Richard–Alice and Lucy: *I'm a doggy.*
Alice–SG: *No, turn him back to Hermione's dad, we want somebody to marry.*
Lucy–Cbs: *Marry me marry me. Abracadabra. Make Richard turn into a boy.*

The girls chase Richard around the role-play area, with Alice again in control:

Alice–Lucy: *Hey Lucy, there's a big surprise for you. These wands will turn Richard into a grown up … I've got off his doggy hair.*
Richard–Alice: *I've put on real hair.*
Alice–SG: *He's standing up like a real person.*

The girls are getting really excited now and speak in much louder voices:

Lucy–Alice: *The spells aren't working.*
Alice–Lucy: *I know, magic drink.*
They pick up bottles of coloured water and pretend to mix a drink.

Alice is a skilled player who likes to get everyone organised, and knows the routines for developing the momentum of the play. Alice's invitation, 'I wonder why our dog has been so naughty', enables her co-players to step into the flow of this episode, as