

# Jean Piaget Society

Society for the Study of Knowledge and Development

## Program of the 32<sup>nd</sup> Annual Meeting

June 6-8, 2002, Philadelphia, PA

# The Embodied Mind and Consciousness: Developmental Perspectives

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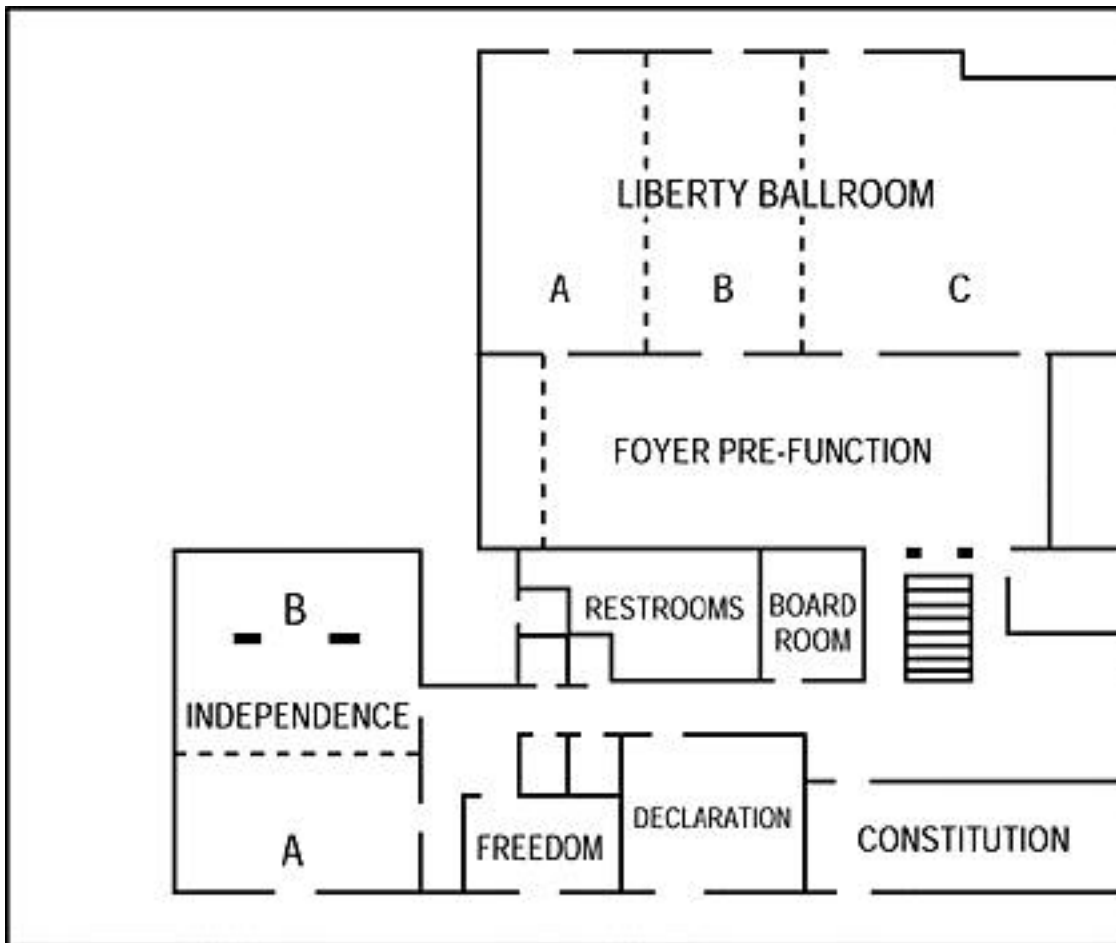
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### FLOORPLAN



**Program Overview: Thursday, June 6**

THURSDAY	Liberty A	Liberty B	Liberty C	Indep. A	Indep. B	Declaration	Constitution	
9:00-4:30	Registration (all day – Foyer)							
9:00-9:15			Opening Remarks	Book Display				
9:15-10:30			PL01					
10:30-10:45	Break				Break			
10:45-12:00			PL02					
12:00-1:30	Lunch				Lunch			
1:30-2:45			PL03					
2:45-3:00	Break				Break			
3:00-4:30	PP01	PP02	SY01			BOD	SY02	
4:30-7:00	Dinner							
7:00-8:30			DS01					
8:30		Reception						

8:00-4:30	Foyer		Registration (all day)
9:00-4:30	Indep A		Book Display
9:00-9:15	Liberty C	OR	President's Opening Remarks - Elliot Turiel Orienting Remarks from Meeting Organizers - Willis Overton, Ulrich Mueller
9:15-10:30	Liberty C	PL01	Plenary Session 1: From brain dynamics to consciousness: How matter becomes imagination - Gerald M. Edelman
10:30-10:45	Break		
10:45-12:15	Liberty C	PL02	Plenary Session 2: Rethinking Emotion - Antonio Damasio
12:15-1:30	Lunch		
1:30-2:45	Liberty C	PL03	Plenary Session 3: The Embodiment of Self - Oliver Sacks
2:45-3:00	Break		
3:00-4:30	Liberty A	PP01	Paper Session 1: Developing tolerance
	Liberty B	PP02	Paper Session 2: Narratives, symbols, and embodiment
	Liberty C	SY01	Symposium Session 1: Embodying Models of Human Development: Bodily, Contextual and Experiential Mediators of Meaning
	Declaration	BOD1	Board of Directors Meeting
	Constitution	SY02	Symposium Session 2: The socialization of embodied action: Negotiating space, learning, and morality in child and adolescent discourse
4:30-7:00	Dinner		
7:00-8:30	Liberty C	DS01	Discussion Session 1: Embodiment from a biological and philosophical perspective: A discussion featuring Gerald M. Edelman, Antonio Damasio, Oliver Sacks & Mark L. Johnson. Moderated by Thomas Dalton.
8:30-	Foyer		President's Reception

**Program Overview: Friday, June 7**

FRIDAY	Liberty A	Liberty B	Liberty C	Indep. A	Indep. B	Declaration	Constitution	
9:00-12:00	Registration (morning only – Foyer)							
9:00-10:30	SY03	SY04	IS01	Book display	Poster viewing	PP03	PP04	
10:30-10:45	Break					Break		
10:45-12:00			PL04					
12:00-1:30	Lunch (Member's Meeting – Liberty C)					Lunch		
1:30-3:00	SY05	SY06	IS02		Poster Session 1	PP05	PP06	
3:00-3:15	Break				Break			
3:15-4:45	PP07	SY07	DS02		Poster viewing	PP08	PP09	
4:45-5:00	Break				Break			
5:00-6:15			PL05					

9:00-12:00	Foyer		Registration (morning only)
9:00-4:30	Indep. A		Book Display
	Indep. B		Poster viewing (authors will be present 1:30-3:00)
9:00-10:30	Liberty A	SY03	Symposium Session 3: Children's mathematical and scientific education. Some constructivist views
	Liberty B	SY04	Symposium Session 4: Studying attachment from a stage perspective
	Liberty C	IS01	Invited Symposium 1: Locating the body: Feminist perspectives on embodiment and development. - Patricia H. Miller, Ellin K. Scholnick, Jeanne Marecek, Nita McKinley
	Declaration	PP03	Paper Session 3: Clinical issues
	Constitution	PP04	Paper Session 4: Communication and representation
10:30-10:45	Break		
10:45-12:00	Liberty C	PL04	Plenary Session 4: Reason incarnate - Mark L. Johnson
12:00-1:30	Lunch	MMTG	Members Meeting 12:00-12:30 (all JPS members are encouraged to attend)
1:30-3:00	Liberty A	SY05	Symposium Session 5: Experience and the Developing Brain: What do We Know? Where Do We go from Here?
	Liberty B	SY06	Symposium Session 6: Constraints on the development of logical reasoning
	Liberty C	IS02	Invited Symposium 2: Embodied identity and consciousness: Focus on Black Experience - William Cross, Jr., Margaret Beale Spencer, Rosemarie Roberts
	Indep. B	PS01	Poster Session 1: Posters will be available for viewing all day
	Declaration	PP05	Paper Session 5: Classroom environments
	Constitution	PP06	Paper Session 6: Methodological issues
3:00-3:15	Break		
3:15-4:45	Liberty A	PP07	Paper Session 7: Adolescent development in cultural contexts
	Liberty B	SY07	Symposium Session 7: Activity Theory and the Embodied Mind
	Liberty C	DS02	Discussion Session 2: Embodiment from a cultural and psychological perspective: A discussion focusing on Piaget's <i>Origins of Intelligence</i> featuring Thomas J. Csordas, Lynn S. Liben, and Esther Thelen.
	Declaration	PP08	Paper Session 8: Cognitive development and pedagogy
	Constitution	PP09	Paper Session 9: Integrating theories of cognition and reasoning
4:45-5:00	Break		
5:00-6:15	Liberty C	PL05	Plenary Session 5: Representational Development and the Embodied Mind's Eye - Lynn S. Liben

**Program Overview: Saturday, June 8**

SATURDAY	Liberty A	Liberty B	Liberty C	Indep. A	Indep. B	Declaration	Constitution	
9:00-12:00	Registration (morning only – Foyer)							
9:00-10:30	SY08	SY09	SY10	Book display	Poster viewing	PP10	PP11	
10:30-10:45	Break					Break		
10:45-12:00			PL06					
12:00-1:30	Lunch					BOD2		
1:30-3:00	SY11	SY12	IS03			Poster Session 2	PP12	PP13
3:00-3:15	Break					Break		
3:15-4:45	SY13	PP14	IS04		Poster viewing	PP15	PP16	
4:45-5:00	Break					Break		
5:00-6:15			PL07					

9:00-12:00	Foyer		Registration (morning only)
9:00-4:30	Indep. A		Book Display
	Indep. B		Poster viewing (authors will be present 1:30-3:00)
9:00-10:30	Liberty A	SY08	Symposium Session 8: The One Miracle View of Theory of Mind: The Devil is in the Details
	Liberty B	SY09	Symposium Session 9: Hands on learning: An examination of how different embodied representations influence concept learning
	Liberty C	SY10	Symposium Session 10: Perspectives on embodied consciousness across the life span
	Declaration	PP10	Paper Session 10: Issues for education and educators
	Constitution	PP11	Paper Session 11: Metatheory and metaconsciousness
10:30-10:45	Break		
10:45-12:00	Liberty C	PL06	Plenary Session 6: Embodiment and the Sacred - Thomas J. Csordas
12:00-1:30	Lunch		
12:00-1:30	Declaration	BOD2	Board of Directors Meeting
1:30-3:00	Liberty A	SY11	Symposium Session 11: Cognitive and Biological Factors in Social Reasoning
	Liberty B	SY12	Symposium Session 12: The role of representation in children's mathematics
	Liberty C	IS03	Invited Symposium 3: Embodiment of Meaning - Irving Sigel, Uri Shafir. (preceded by presentation of <i>JPS Life-Time Achievement Awards</i> to Harry Beilin and Irving Sigel)
	Indep. B	PS02	Poster Session 2: Posters will be available for viewing all day
	Declaration	PP12	Paper Session 12: Embodied mind in Piagetian perspective
	Constitution	PP13	Paper Session 13: Biobehavioral systems theory
3:00-3:15	Break		
3:15-4:45	Liberty A	SY13	Symposium Session 13: Epistemology in Action: Naturalism, Infancy, and Robotics
	Liberty B	PP14	Paper Session 14: Theory of mind
	Liberty C	IS04	Invited Symposium 4: Perspectives on the early development of consciousness - Philip D. Zelazo, Michael Lewis, John Barresi, Chris Moore
	Declaration	PP15	Paper Session 15: Math and science education
	Constitution	PP16	Paper Session 16: Embodiment, creativity, and phenomenology
4:45-5:00	Break		
5:00-6:15	Liberty C	PL07	Plenary Session 7: Developmental Origins of the Embodied Mind - Esther Thelen

## Thursday, June 6, A.M.

8:00-4:30	Foyer		<b>Registration</b> (all day)
9:00-4:30	Indep A		<b>Book Display</b>
9:00-9:15	Liberty C	OR	<b>President's Opening Remarks</b> - Elliot Turiel Orienting Remarks from Meeting Organizers - Willis Overton, Ulrich Mueller

9:15-10:30	Liberty C	PL01	<b>Plenary Session 1</b> <i>From brain dynamics to consciousness: How matter becomes imagination.</i>
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Gerald M. Edelman, The Neurosciences Institute

Most approaches to understanding consciousness are generally concerned with the contributions of specific brain areas or groups of neurons. By contrast, in this talk, I consider what kinds of neural processes can account for key properties of conscious experience including its unity and its diversity.

To understand how these processes of brain dynamics give rise to consciousness requires a global brain theory. I shall therefore review a selectional theory called Neural Darwinism that rejects strict computer models of the brain and mind. This theory considers brain complexity to be integrated by a process called reentry. Applying measures of neural integration and complexity, together with an analysis of extensive neurological data, leads to a testable proposal—the dynamic core hypothesis—about the properties of neural substrate of consciousness. This hypothesis is built on cortical mechanisms involving reentrant signaling. Supporting evidence from MEG studies of human subjects will be presented and possible implications for developmental psychology will be considered.

10:30-10:45			Break
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10:45-12:15	Liberty C	PL02	<b>Plenary Session 2</b> <i>Rethinking Emotion</i>
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Antonio Damasio, University of Iowa

After receiving remarkable attention from scientists during the 19th century, emotion was relatively neglected throughout this century, especially within the field of neuroscience. Recently, however, neuroscientists have begun again to advance the understanding of the neural mechanisms behind emotion.

Rather than being elusive, emotion is as much amenable to scientific study as any other aspect of behavior. Moreover, emotion is not a luxury: it is an expression of basic mechanisms of life regulation developed in evolution, and is indispensable for survival. It plays a critical role in virtually all aspects of learning, reasoning, and creativity. Somewhat surprisingly, it may play a role in the construction of consciousness.

In my talk I will review a theoretical framework which places emotion and the phenomenon that follows emotion, feeling, in an evolutionary perspective, and discuss their biological roles in homeostasis. I will also review current evidence on neural systems involved in emotion and feeling based on lesion method and functional neuroimaging data.

## Thursday, June 6, P.M.

12:15-1:30	Lunch		
1:30-2:45	Liberty C	PL03	<b>Plenary Session 3</b>

*The Embodiment of Self*

Oliver Sacks, Albert Einstein College of Medicine

2:45-3:00 Break  
 3:00-4:30 Liberty A PP01

Oliver Sacks has written extensively on embodiment and the ways in which the whole person adapts to different neurological conditions. His presentation will continue an exploration of this theme.

### **Paper Session 1**

#### *Developing tolerance*

#### *Profiles of reflective racial tolerance and their relationship with justifications*

Rivka Witenberg, The University of Melbourne

Understanding the development of tolerance has never been more important. This paper will address two issues. The developmental nature of racial tolerance and the kind of justifications used to support tolerance. The method used in this project offers an advantage in exploring development through the use of cluster analysis which allows to identify common response profiles. Six distinct profiles emerged which indicated salient contrasts between the youngest and oldest students. On the basis of ten different kinds of justifications, scaling techniques identified two dimensions. The horizontal axis representing a fairness - diversity dimension. The vertical axis representing an empathy - reasonableness dimension.

#### *Adolescents' conceptions of homosexuality and gender conventions in relation to their moral evaluations of the treatment of gay, lesbian and transgendered peers.*

Stacey S. Horn, University of Illinois at Chicago  
 Larry Nucci, University of Illinois at Chicago  
 Jessica Rosenwein, University of Illinois at Chicago  
 Mary Kachiroubas, University of Illinois at Chicago

This study investigated the influence that adolescents' conceptions of and attitudes toward homosexuality and gender conventions had on their reasoning regarding the treatment of their GLBT (gay, lesbian, bisexual and transgender) peers. Tenth- and twelfth-grade students (N = 300) were given a self-report questionnaire assessing their attitudes about homosexuality and gender atypical peers, experiences with GLBT individuals, and their reasoning regarding the treatment of others. Preliminary analyses revealed relationships between adolescents' beliefs regarding the origins of sexual orientation, familiarity with GLBT individuals, and tolerance for GLBT individuals, as well as their reasoning regarding the treatment of others. Further, analyses revealed adolescents' reasoning was influenced by both sexual orientation and gender identity.

#### *Children's representations of economic inequality*

Antonio Roazzi, Universidade Federal de Pernambuco

An investigation was conducted with a sample of 85 subjects from different social economical statuses (SES): 30 adolescents from high SES families and 55 from low SES families (30 living with their parents and 25 living in the streets). The aim was to explore how the representation of economic inequalities develops and how that level of representation interacts with the social environment in which the child lives. What are the representations that adolescents hold of the different professional occupations practiced by several groups of people in our society, and how are such representations affected by their own family or individual income? Analysis of the resulting data pointed to the existence of a relationship between belonging to a certain social-cultural group and the cognitive aspects of how economic inequalities are represented in our society. That is, we considered that the structure of the system of

super-individual activities in which the child is located plays a crucial role in the development of specific forms of social inequality representation.

*Moral suggestibility in two cultures: Implications for social influence processes, moral development and culture*

Herbert D. Saltzstein, City University of New York  
 Maria daG Dias, Federal University of Pernambuco, Recife, Brazil  
 Antonio Roazzi, Federal University of Pernambuco

Children's suggestibility was studied during interviews about moral dilemmas, where the choice was between promise-keeping and truth-telling. Past results show: (a) younger children are more suggestible; (b) an initial choice of promise is more easily influenced than initial choice of truth; (c) U.S. children are more suggestible than Brazilian children. Finding (c) was attributed to cultural differences in authority relationships between teachers and children. This is supported by contrasting influence by adult and "teenage" interviewers. In U.S., adult interviewers had greater influence than "teenage" interviewers whereas in Brazil, the reverse tends to be true.

3:00-4:30

Liberty B

PP02

### **Paper Session 2**

*Narratives, symbols, and embodiment*

*Using narrative symbols as a vehicle to understand reflective processing*

Julia Penn Shaw, Harvard Graduate School of Education

Forty-four undergraduates and forty-four active adults (45 to 78) used ten narrative symbols they found from a children's story to play a game highlighting different aspects of their reflective processing. The game, Symbol Sort,, measured by Fischer's skill theory, evaluated the complexity (level of skill) and type (e.g., categories, rankings, chronologies, images) of reflective processing. Symbol Sort arrangements of the older group were more complex, to a statistically significant degree, than the younger group's, suggesting that educated, active older subjects reflect in a more complex way than educated, civic-minded younger subjects ( $p = .013$ ).

*The cultural embodiment of mind*

Adrian Medina-Liberty, National University of Mexico  
 Andrea Trevino-Gutierrez, Universidad de las Americas

Currently, it would be extremely rare to find someone who still denies the importance of culture or the role that other people play in cognitive development. However, the specific way in which culture operates is still a matter of dissent. We approach mind from the combined perspective of sociocultural psychology and symbolic anthropology and sustain that mind is both constituted and realized in the use of symbols. It is concluded that psychological processes—i.e., perceiving, learning, remembering—cannot be sustained by themselves; they are always symbolically embodied and they are always dependant upon the utilization of cultural resources.

*"It makes me a man from the beating I took": Accounts of physical violence in the narratives of inner-city boys and girls*

Marsha D. Walton, Rhodes College  
 Alice J. Davidson, Rhodes College  
 Heidi S. Kane, Rhodes College

Inner-city 4th-6th graders from neighborhoods that differed in community violence wrote personal narratives about interpersonal conflict. The 211 stories reporting physical violence were coded for position of the author as victim, perpetrator, both, or observer. Children in the high-risk neighborhood wrote stories with more, and more severe violence than



did children living with less risk. However, their stories were less likely to include explanatory attempts, reports of emotions or thoughts of self or others, or moral assessments. Gender effects mirrored Neighborhood effects, with boys' stories similar to those of children living with higher risk. The role of narrative practice in development is discussed in light of an embodiment theory of mind.

*Consulting the Oracle: Do magazines shape Brazilian teen girls' behavior and values?*

Clary Milnitsky, Universidade Federal do Rio Grande do Sul  
Camila Vidal Menegaz, Universidade Federal do Rio Grande do Sul

The "Capricho" (whimsicality) Magazine focuses on behavior/fashion for adolescents' implicitly relating this to sociomoral values. We discuss the pervasiveness of media in creating, validating behaviors/values that aren't intrinsic to adolescents' psychological systems, but invested on disposable fashionable objects. The content of a decade of the magazine's editorials (1990-2000) and adolescents' interviews was analyzed. The categories stemmed: sexuality, drugs, gender and norms made explicit the magazine's function in replacing more attractively educational orientations including parents. The re-signification of school is discussed. Method: Content Analysis (texts / interviews) of twenty adolescents attending two private local schools.

Moderator: Yasuji Kojima, Hokkai-gakuen University

3:00-4:30      Liberty C      SY01

Symposium Session 1

*Embodying Models of Human Development: Bodily, Contextual and Experiential Mediators of Meaning*

Organizers: Michael F. Mascolo, Merrimack College and Monica Cowart, Merrimack College

Discussant: Mark L. Johnson, University of Oregon

Participants in this symposium will explore ways of understanding the embodied character of human thinking and development. Many classic and current models of thinking have depicted thinking as process of manipulating symbols and internal codes in ways that seem separate and distinct from the functioning of actual human bodies in the experienced world. However, thinking, even abstract thinking, proceeds as an embodied course of activity. The structure and content of thinking in development are realized within the medium of the body-in-action; is embodied by emotion and feeling; is structured by concrete metaphors of the nature of self and world, and occurs within physical and social contexts that scaffold and direct development. Participants in this symposium will explore different ways in which (a) models of human thinking and development can incorporate the concept of embodiment as a foundational principle, as well as (b) ways in which particular sources or modes of embodiment structure and spur the development of thought. These analyses will include explorations of the ways in which the development of thought is shaped by metaphor, emotion, phenomenal experience, as well as by the support and scaffolding provided by social and physical context.

*Embodied Abstractions: Metaphor as a Mediator of the Development of Conceptions of Self and Other in Psychotherapy*

Michael F. Mascolo, Merrimack College  
Michael Basseches, Suffolk University

*Cognition Grows Between Sensorimotor and Emotional "Surfaces" of the Developing Brain*

Marc D. Lewis, University of Toronto

*The Role of Cognitive Scaffolding in Embodied Explanations of Thinking*

Monica Cowart, Merrimack College

*Movement and Expression in the Development of Social Cognition*

Shaun Gallagher, Canisius College

3:00-4:30 Declaration BOD1 Board of Directors Meeting

3:00-4:30 Constitution SY02 Symposium Session 2

*The socialization of embodied action: Negotiating space, learning, and morality in child and adolescent discourse*

Organizer: Ashley E. Maynard, University of Hawaii

In 1934 Marcel Mauss made the distinction that "in every culture, people know how to use their bodies." That is, every culture has standards for comportment and ways of moving associated with particular activities. In this symposium, we demonstrate the ways that children are socialized for correct movement, body position, and gesture in several domains: at home; in learning activities with older siblings; in an elementary school classroom; in an afterschool dance program; and on the playground. We look at the ways that children represent deixis and space by using gestures, the way that children negotiate morality and proper body position, and the way they represent and develop further knowledge through bodily movement. Each paper addresses some point along the developmental trajectory: from early childhood through adolescence. DeLeon describes longitudinal data of siblings negotiating domestic space. She describes the way the children use deixis, emotional displays, and discourse to learn to inhabit that space. Maynard focuses on the way that older siblings guide the bodies of younger learners in the course of teaching them everyday activities. Maynard's data show how very young children are already aware of cultural means of representing knowledge in physical action. Isaac discusses peer socialization of "work" postures in the classroom. She describes the ways that a teacher and peer-groups co-construct and maintain norms of classroom behavior. Schick describes adults' concomitant shaping of body position and morality in after-school dance classes. Goodwin describes how middle-school girls use embodied accounts to admonish and support particular body movements in playground games. Overall, these papers provide a glimpse into the ways that children develop an embodied sense of self, activity, and morality.

*Body and domestic space in Zinacantec socialization*

Lourdes de Leon, CIESAS Sureste, Chiapas, Mexico

*Maya Sibling Socialization of Movement in Everyday Learning Tasks*

Ashley E. Maynard, University of Hawaii

*Socializing the Body to 'Work' during Student Workgroup Activities*

Adrienne Isaac

*"You Cannot Cheat the Footwork": Taking Steps Toward a Morality of Cooperation and Autonomy in a Middle School Dance Class*

Laurie Schick, UCLA

*Embodied Language Games*

Marjorie H. Goodwin, UCLA

4:30-7:00 Dinner

7:00-8:30 Liberty C DS01 Discussion Session 1

*Embodiment from a biological and philosophical perspective: A discussion featuring Gerald M. Edelman, Antonio Damasio, Oliver Sacks & Mark L. Johnson. Moderated by Thomas Dalton.*

8:30-

Foyer

President's Reception

**Friday, June 7, A.M.**

9:00-4:30 Foyer  
 Indep. A  
 Indep. B  
 9:00-10:30 Liberty A SY03

**Registration** (all day)

Book Display

**Poster viewing** (authors will be present 1:30-3:00)**Symposium Session 3***Children's mathematical and scientific education. Some constructivist views*

Organizer: Maria Lucia Faria Moro, Universidade Federal do Parana  
 Discussant: none

It is relatively recent, but qualitatively significant, the increment of investigation concerning the construction of concepts, relationships, competence or cognitive functions referring directly to the learning of school contents, under different interpretations of the constructivist perspective. The symposium aims to bring to discussion some empirical results referring to aspects of the elaboration of mathematical and scientific knowledge in school learning. The first paper (Puche-Navarro & Ordonez) focuses on children's inferential functioning in problem solving, according to the mental model framework, which is considered relevant in the recognition of functional levels of scientific understanding in early childhood. The second one (Garcia-Mila et al.) analyses the relevant role of writing and note-taking in the process of strategies acquisition that occurs when pre-adolescents work on the whole cycle of scientific reasoning, from the hypothesis generation to the inferences elaboration. The third one (Orozco) investigates the role of morfosyntactic traces of verbal numerical expressions in the learning of Arabic numerical notation by elementary school children, contributing to the debate about numerical transcription from verbal speaking format to the Arabic writing format. The fourth (Moro) describes the nature and the progress of notations produced by elementary school children in tasks concerning the initial learning of additive structures on its way to the multiplicative ones. The role of the awareness process of the subject's own actions in the conceptual construction in mathematical education is highlighted. The evaluation of alternative ways to implement the reported results in school systems and in teachers training will be emphasized while discussing the theoretical contributions of the presented papers.

*Inference, understanding and mental models in early childhood*

Rebeca Puche-Navarro, Universidad del Valle  
 Oscar Ordonez, Universidad del Valle

*Writing and scientific reasoning. A microgenetic study to analyse their mutual interaction*

Merce Garcia-Mila, Universitat de Barcelona  
 Nubia E. Rojo, Universitat de Barcelona  
 Christopher L. Andersen, Ohio State University  
 Eduard Marti, Universitat de Barcelona  
 Ana Teberosky, Universitat de Barcelona  
 Raquel Mayordomo, Universitat de Barcelona

*Syntactic errors when learning to write numerals*

Mariela Orozco, Universidad del Valle

*Notations in Mathematics beginnings: equalizing and dividing quantities on the multiplication roots*

Maria Lucia Faria Moro, Universidade Federal do Parana

9:00-10:30 Liberty B SY04 **Symposium Session 4**

*Studying attachment from a stage perspective*

Organizer: Patrice Marie Miller, Harvard Medical School

Attachment theory was proposed by Bowlby and studied by Ainsworth and many colleagues. It partly specifies developmental changes in attachment. Few of the attempts have explicitly integrated changes in attachment behavior, objects of attachment, processes by which individuals become attached, relevant caregiving behavior, and implications for psychopathology using a systematic, lifespan stage theory of development. The current symposium represents an integration of the Model of Hierarchical Complexity with Attachment theory. Although these specific papers involve infancy only, they form part of a larger theoretical integration across the lifespan.

*What are the Stages of Attachment During Infancy?*

Michael Lamport Commons, Harvard Medical School

*How are the processes by which infants become attached influenced by stage of development?*

Patrice Marie Miller, Harvard Medical School

*How do patterns of caregiving vary across developmental stage?*

Patrice Marie Miller, Harvard Medical School

*Can we improve prediction of psychopathology by taking into account stage of development at the time of trauma?*

Michael Lamport Commons, Harvard Medical School

9:00-10:30 Liberty C IS01 **Invited Symposium 1**

*Locating the body: Feminist perspectives on embodiment and development.*

Organizer: Patricia H. Miller, University of Georgia

Embodiment is thought to be a remedy for the deficiencies of the Cartesian framework in which mind is divorced from body, thought from emotion, and the individual from the social context. Feminists have noted that the Cartesian framework also divorces masculine abstraction and reductionism from qualities which are stereotyped as feminine-materiality, emotionality, and situational embeddedness. A post-modern view, influenced by Foucault, deepens the concept of embodiment by postulating that cultural images, beliefs, and practices encode the body in a form that reproduces the gendered power structure of the society. Culture constrains how we dress, move, and think about our bodies. Think of the burqa that enshrouds the Afghan woman and limits her capacity to reach out and touch her environment while muffling her voice.

What are the implications of this view of embodiment for developmental psychology? Although the child undergoes dramatic bodily changes during development, the impact of the individual's awareness of these changes and the individual's strategies for coping with bodily change have often been neglected. These changes occur in a cultural context of images and expectations about the development of boys and girls into men and women. Ironically, we have created a disembodied context for psychological growth despite rapid physical changes that do not go unnoticed in our culture. In this panel, feminist psychologists explore two questions: Where is the body in developmental psychology? Whose body is it? We examine how cultural practices associated with gender inscribe the changing body and the way growing individuals think about it.

One obvious point of examination is adolescence when the teenager must cope with a changing appearance and the emergence of reproductive capacity. Nita McKinley examines how cultural expectations of the ideal feminine body color adolescents, and college students, self image, behavior and social relations. Jeanne Marecek analyzes the social processes that sexualize the bodies of adolescent and pre-adolescent girls and simultaneously construct sexualized bodies as vulnerable. That sense of vulnerability and danger then regulates girls, subjectivity and the mother-daughter relationship. The issues of embodiment also are relevant to early cognitive development because the growing mind is housed in a growing body that greatly extends the child's capabilities. Parents praise their offspring by noting that they behave like a big girl (or boy) and children wonder when they are big enough to do certain things. Patricia Miller and Ellin Scholnick analyze current research on the child's conception of the body and growth. They attempt to recover the body in theories of biological essentialism and in the concept of gender constancy.

*Cognition in the flesh: Feminist perspectives on cognitive development*

Patricia H. Miller, University of Georgia  
Ellin K. Scholnick, University of Maryland

*Safe Conduct: Dangers, pleasures, and adolescent sexuality*

Jeanne Marecek, Swarthmore College

*Placing women's body experience in developmental and cultural context*

Nita McKinley, Allegheny College

9:00-10:30 Declaration PP03

### **Paper Session 3**

*Clinical issues*

*Metacognition and Learning Disabilities: The Influence and Interrelations of Affect, Motivation and the Self-System.*

Kavita L. Seeratan, University of Toronto

Metacognition is subjected to and regulated by both cognitive and affective components. Many researchers tend to focus on certain topics that capture the cognitive aspects of understanding metacognition. But understanding the affective component (self systems, motivation) and its potential influence on both cognitive and metacognitive processes as well as the influence that these processes may in turn have on the affective system is also important. This paper aims to coordinate the relations between cognition, metacognition and affect by: considering the autonomy and then inter-relational dynamics of the different systems first generally and then in relation to learning disabilities.

*Is phonological awareness an instance of consciousness?*

Fernando Leal, University of Guadalajara, Mexico  
Judith Suro, University of Guadalajara, Mexico

Although dyslexia has been connected to a deficit in phonological awareness as revealed in reading acquisition, an application of the stage model of skill development to reading reveals a curious anomaly in such an explanation. The first stage of any skill acquisition is acutely conscious, so any novice reader has to become aware of phonology in order to learn how to read. Once a reader becomes more proficient, the processing of phonological information necessary for reading recedes beneath consciousness. Since dyslexics never quite achieve full automaticity, they do not suffer from a deficit, but from an excess of phonological awareness.

*Implications of the Embodied Mind for Clinical Practice*

Glenn E. Good, Wayne State University School of Medicine

At the dawn of the 20<sup>th</sup> century, neurologist Sigmund Freud introduced the book *The Interpretation of Dreams* which provided a methodology for listening to primitive “primary process” thinking, contained within adult “secondary process” conscious communications. To conceptualize what he had discovered, however, Freud had to borrow from what was available to him at the time: turn of the century neurology. In spite of major changes and developments in technique, psychoanalytic theory continues to be saddled with the baggage of these outmoded neurological concepts. This paper takes a fresh look at psychoanalysis and psychotherapy from the vantage point of neurology 100 years later. The author proposes theoretical revisions in light of the contributions of Damasio and Edelman as well as the contributions of Piaget and discusses the implications for clinical technique.

*Age differences in young children’s reports of temporal information in the course of forensic interviews.*

Yael Orbach, National Institute of Child Health & Human Development

Michael E. Lamb, National Institute of Child Health & Human Development

Kathleen J. Sternberg, National Institute of Child Health & Human Development

Phillip W. Esplin, Private Practice, Phoenix

Heather Stewart, Salt Lake County Children’s Justice Center

Susanne Mitchell, Salt Lake County Children’s Justice Center

Moderator: Yasuji Kojima, Hokkai-gakuen University

9:00-10:30 Constitution PP04

**Paper Session 4***Communication and representation**Scheme-Scheme and Scheme-Object Relations: A Theory of Consciousness*

Joe Becker, University of Illinois at Chicago

In constructivist theory, the interplay between scheme-object relations and scheme-scheme relations is central to thought. In activities using external representational media, such as painting and language, there is an interplay between the relations of elements within the medium to external referents and the intra-medium relations. This similarity suggests that consciousness arises from a sense that detects the distinction between scheme-objects relations and scheme-scheme relations. Our consciousness of existing within an external phenomenal world is our subjective experience of that detection. This perspective provides a basis for theorizing the role of language in extending our consciousness.

*When do children gestures to retrieve symbols?*

Elena Nicoladis, University of Alberta

The use of symbolic gestures has been shown to help adults recall words (Frick-Horbury & Guttentag, 1998). Results such as these suggest that adults have multiple pathways to their symbols. The present study focused on when children might develop similar multiple pathways. Eight preschool children between the ages of 3;6 and 4;11 were videotaped in free-play sessions. The children created longer utterances when they used iconic gestures than when they used points or no gestures at all. Further qualitative analyses suggest that children’s gestures are used in a more adult-like way as they get older.

*A constructivist account of the emergence of pointing in infancy.*

Dagmar Pescitelli, Simon Fraser University

Infants engage in behaviors before one year of age that suggest some early social understanding. There is controversy as to whether such behaviors demonstrate that infants 'understand' others as intentional agents at this early age, or whether it is through such behaviors that infants come to understand others as intentional agents (Moore & Corkum, 1994; Tomasello, 1999). A longitudinal case study is utilized to illustrate the emergence of gestural communication in infancy. A Piagetian account is outlined that casts doubt on the claim that infants must first 'understand' others as intentional agents before pointing can occur.

*Pictorial and Narrative Representations of Children's School Bullying Experiences*

Sandra Bosacki, Brock University

Zopito Marini, Brock University

This study investigates children's perceptions of school bullying as represented by both their narratives and drawings. Eight-two children (Grade 4, n=30, M = 9;7; Grade 5, n=18, M = 10;7; Grade 7, n=34, M = 11;9) from a mainly Euro-Canadian, middle SES, Ontario city completed standardized measures (self-concept, bullying/victimization, gender-role orientation, vocabulary), and participated in individual interviews that required them to complete ToM tasks and to draw and narrate stories of "someone being bullied." Findings revealed gendered themes of bullying experiences. In both modes of representation, girls referred to psychological (cognitive and emotional) bullying whereas boys focused on social and physical bullying.

Moderator: Andrea Pantoja, California State University, Chico

10:30-10:45 Break

10:45-12:00 Liberty C

PL04

**Plenary Session 4***Reason incarnate*

Mark L. Johnson, University of Oregon

A central problem for any theory of embodied mind is to explain how abstract conceptualization and reasoning are grounded in structures of bodily experience. Recent research in the cognitive sciences is beginning to reveal how patterns of sensorimotor experience shape our abstract thought via conceptual metaphor. This emerging view of the bodily basis of imaginative thought calls into question fundamental underlying assumptions of mainstream philosophy.



**Friday, June 7, P.M.**

12:00-1:30 Lunch

12:00-12:30 Liberty C MMTG **Members Meeting** (all JPS members are encouraged to attend)1:30-3:00 Liberty A SY05 **Symposium Session 5***Experience and the Developing Brain: What do We Know? Where Do We go from Here?*

Organizer: Thomas C. Dalton, Cal Poly State University

Discussant: Michael Lewis, Robert Wood Johnson Medical School

Developmental scientists no longer view development, as if it could be neatly partitioned along a continuum in which the earliest events reflect largely genetic influences and the later events are shaped by environment and culture. Instead they see individual growth in terms of a reciprocal interaction of neural, behavioral and cultural events that occur throughout an individual's lifetime. Together, these interactions contribute cumulatively over time to small but important changes in the human phenotype. There are many non-obvious ways that the early development of the brain is shaped by experience that deserve serious scrutiny. This symposium will put these issues in theoretical and empirical context that highlight promising new directions for research. The first paper examines how brain connections are formed through experience-dependent perceptual categorization. A real-world behaving device is used to show how exploratory experiences are translated into cortical interactions capable of making choices based on the initial values assigned to objects. The second paper will review recent evidence indicating that information presented redundantly and in temporal synchrony across sensory modalities selectively recruits attention and facilitates perceptual learning in animal and human infants. Implications of the salience of intersensory redundancy for early neural, perceptual and cognitive development will be discussed. The third paper will examine three aspects of spatial development. It will focus on how spatial coding systems are reweighted in the first year of life, describe the profound transition in spatial coding occurring in the second year of life, and consider how interactions with the environment may contribute to the developmental changes observed. The discussant will put these papers in the context of recent theoretical debates about consciousness and whether the brain possesses modular, dedicated structures, or supports neural functional and attention processes that develop and respond flexibly to the contingencies of early experience.

*Machine Psychology: Experience-Dependent Perceptual Categorization and Learning in a Brain-Based Device*

Jeff Krichmar, The Neurosciences Institute

*Perceptual development and multisensory responsiveness: The role of redundancy in early development*

Robert Lickliter, Florida International University

*What Do You Say After You Say Interactionism? Spatial Development in the First Two Years.*

Nora S. Newcombe, Temple University

1:30-3:00 Liberty B SY06 **Symposium Session 6***Constraints on the development of logical reasoning*

Organizer: Sylvain Moutier, CNRS

Discussant: Guy Politzer, Universite de Paris 8

Recent work that has examined developmental patterns in deductive reasoning has clearly indicated that understanding how children reason

involves understanding the constraints imposed by the specific characteristics of children's cognitive architecture. A variety of mechanisms have been proposed to do this, varying from hypotheses that at least some forms of reasoning have an evolutionary basis (e.g. Cosmides) to more procedural accounts of reasoning (e.g. Johnson-Laird) that involve limitations in processing capacity. This symposium presents a series of empirical studies that examine different hypotheses about how these kinds of mechanisms can influence the development of logical reasoning.

*Is Deontic Reasoning Special? A Developmental Comparison of Inferences from Causal and Social Permission Conditionals*

Paul A. Klaczynski, The Pennsylvania State University

*Deductive reasoning and matching-bias inhibition training : Evidence from a debiasing paradigm*

Sylvain Moutier, CNRS

*Are older adolescents less 'logical' than younger ones?: The interaction between knowledge and reasoning when accepting the premises in conditional reasoning.*

Henry Markovits, Universite du Quebec a Montreal

*The role of limitations in working memory on the development of reasoning*

Pierre Barrouillet, Universite de Bourgogne

1:30-3:00

Liberty C

IS02

### **Invited Symposium 2**

*Embodied Identity & Consciousness: Focus on the Black Experience*

Organizer: William E. Cross, Jr., CUNY

Recent advances in science have revealed that "race" is useless, as a biological concept; however, race, as a social construct, is alive and well. People of color in general and black people in particular often find it necessary to develop consciousness about the meaning and social significance of their non-European physicality. In addressing their "black bodies" African Americans evidence a wide range of mindsets, and this panel samples that diversity. One paper explores the phenomenon of skin-bleaching and identity; a second shows the links between embodied consciousness, black dance and black identity; and a third summarizes the varied meaning black youth attach to their blackness. A final paper highlights the range of adult black identities, from "color-blindness" to Black Nationalism and Multiculturalism.

*Identity as Coping: Adolescents' Racial Identity Challenges and Opportunities*

Margaret Beale Spencer, University of Pennsylvania

In a recent longitudinal study of adolescents, body-image, self-reported skin color, and self-identification (race/ethnicity/nationality) data were collected as part of a larger effort. The assessment strategy presented the opportunity to report race/ethnicity information in both a "forced category" (i.e., similar to traditional census data collection efforts) as well as open-ended format. Surveys were obtained from low resource urban African American adolescents. The two conditions, forced-choice versus open-ended, produced divergent response patterns. Findings are framed by a theoretical orientation that integrates identity and coping processes, with physical and ethnic characteristics such as race, ethnicity and skin color.

*Critical consciousness, black identity, and black dance*

Rosemarie Roberts, Graduate Center CUNY

Commitments to critical consciousness objectives have been recognized in education, the arts, and dance education. This dissertation study examines how educators provoke critical consciousness within the terrain of dance. Using African-derived Black dance as the site of study, this inquiry addresses three areas across time, audiences, and encounter settings: 1) Process of educating to provoke critical consciousness; 2) Content of critical consciousness; and 3) theories of audience provocation. Case studies of three prominent, African-American, explicitly political dancers/choreographers/educators, Katherine Durham, Ronald K. Brown, and Gaille Will Jo Collar, will be undertaken in order to examine these research questions. A multi-method approach, including interviews, observations and archival data collection, will be used in order to build the case studies.

*Skin bleaching, self-hate and the construction of black identity in Jamaica*

Christopher Charles, Graduate Center - CUNY

The dominant view concerning Jamaicans who bleach their skins is that they suffer from self-hate or low self-esteem. This self-hate it is argued is a result of the psychological scars of slavery that lingers in the post-colonial period. In the color-coded Jamaica where the white concept of beauty is the ideal, some people have internalized the negative views about blackness. They therefore strive to be white by bleaching their skin. The self-hate thesis is tested, by measuring the self-esteem scores of a sample of bleachers. The self-esteem scores of the bleachers are then compared to the self-esteem scores of a control group of non-bleachers. The results are then used to explore the issue of black identity in Jamaica.

*Nominality, social categorization, and transcendence in black identity*

William E. Cross, Jr., CUNY

There is a keen physical dimension to black "racial" identity but recent studies show that blacks vary in the degree to which physicality anchors their reference group orientation. This paper will reflect on identity variability and identity physicality.

1:30-3:00

Indep. B

PS01

**Poster Session 1**

*Note: Posters will be available for viewing all day. Authors will attend from 1:30-3:00*

**1. Korean, Japanese, and U. S. Students' Judgments about Exclusion: Evidence for Diversity**

Yoonjung Park, University of Maryland at College Park

**2. Baseball or Ballet?: Korean-American Children's and Parents' Evaluations of Choice of Activity for Boys and Girls"**

Jennie Lee-Kim, University of Maryland

**3. Korean Children's Evaluations of Parental Gender-Specific Play Expectations**

Yunhee Shin, University of Maryland at College Park

**4. Children's thinking about opposition, subversion, and compliance in response to victimization**

Leigh A. Shaw, University of Utah  
Cecilia Wainryb, University of Utah

*5. A study based on Piaget in children from 9 to 14 years old about punishment in The Arabian Nights Entertainments tales.*

Luana Carramillo Going, Universidade Metodista de Sao Paulo  
Lino de Macedo, Universidade Sao Paulo

*6. Children's decision-making about features of social relationships*

Heidi McGlothlin, University of Maryland, College Park  
Melanie Killen, University of Maryland, College Park  
Christy Edmonds, University of Maryland, College Park  
Katherine Zukowski, University of Maryland, College Park

*7. The influence of gender and personal experience on young adults' evaluations and reasoning regarding the treatment of gender non-conventional peers.*

Stacey S. Horn, University of Illinois at Chicago  
Anna Kurtz, University of Illinois at Chicago  
Larry Nucci, University of Illinois at Chicago

*8. Language of the preadolescent self: Perceived self-worth and self-understanding*

Sandra Leanne Bosacki, Brock University

*9. Appropriation Level Evaluation for "Recovery and Signification of Cultural Practices for pre-scholars" Educative Program*

Hernán Sanchez Ríos, Universidad del Valle-Cali- Colombia  
Solanlly Ochoa Angrino, Universidad del Valle-Cali- Colombia

*10. Children's essays on care: A pilot study*

Pamela A. Raya-Carlton, University of Missouri-Columbia  
Yiting Chang, University of Missouri-Columbia  
Thuy Do, University of Missouri-Columbia

*11. Colombian children's ideas about peer-conflict resolution and peace making strategies: the effects of war and violence on children's moral reasoning.*

Alicia Ardila-Rey, University of Maryland  
Camilo Delgado, Fundacion Universitaria San Martin - Bogota  
Colombia

*12. Children's Request Strategies and the Development of Social Understanding*

Denise Goldbeck, Simon Fraser University  
William Turnbull, Simon Fraser University

*13. The sub-text of adolescent identity formation: A text analysis of adolescent interviews*

Darcy Hallett, University of British Columbia  
Bryan W. Sokol, University of British Columbia

*14. Spanish children's and adolescents' judgments about ethnic exclusion: The case of Gypsies and Africans*

Ileana Enesco, Universidad Complutense de Madrid  
Alejandra Navarro, Universidad Autonoma de Madrid  
Isabel Paradela, Universidad Complutense de Madrid  
Carolina Callejas, Universidad Complutense de Madrid  
Cristina Fernandez, Universidad Complutense de Madrid

*15. African-American Children's Emotional Competence in the Context of Sociomoral Events*

Marisha L. Humphries, University of Chicago  
Robert J. Jagers, Howard University

*16. Gender Differences in the Expression of Aggression: The Roles of Language and Aggression Target*

Sharice Brown, University of Connecticut  
Letitia R. Naigles, University of Connecticut

*17. Love as a Persisting Emotion*

Sherri C. Widen, Boston College  
James A. Russell, Boston College

*18. The pathway toward resilience in First Nations adolescents: The contribution of social perspective coordination.*

Tara Flanagan, McGill University  
Catherine Zygmuntowicz, McGill University  
Jake Burack, McGill University  
Beth Randolph, McGill University  
Grace Iarocci, Simon Fraser University  
Tarek Mandour, Jimmy Sandy Memorial School  
Sandy Robinson, Jimmy Sandy Memorial School

*19. Children's conceptions of the sources of knowledge in social and non-social domains*

Charles C. Helwig, University of Toronto  
Beverly Brehl, University of Utah

*20. Toddlers discuss gender*

Ellin K. Scholnick, University of Maryland  
Jodi Jacobson, University of Maryland

*21. The embodied imagination in childhood chronic illness*

Cindy Dell Clark, Penn State Delaware County

*22. Inclusion on the Basis of Gender and Race: A Personal Choice or a Moral Imperative?*

Melanie Killen, University of Maryland  
Jennie Lee-Kim, University of Maryland  
Heidi McGlothlin, University of Maryland

*23. How disadvantaged Brazilian adolescents find meaning in school: A Ricoeurian analysis*

Analia Kiela Ribeiro, Universidade Federal de Pernambuco  
Maria Lyra, Universidade Federal de Pernambuco  
Cynthia Lightfoot, Penn State University

*24. A study on the relationships among equity, justice and forgiveness reasoning.*

Julio Rique, Northern Illinois University  
Maria Tereza Lins-Dyer, University of Illinois at Chicago  
Cleonce Camino, Federal University of Paraiba, Brazil

*25. Examining students' reactions to moral dilemmas: What written responses reveal about cognitive conflict*

John Tyler Binfet, Loyola Marymount University

*26. Reality and Idea - reflection or selection? Two ways in which young children's perceptual discrimination interacts with conceptual change while building water systems*

Sharona T. Levy, Tel-Aviv University

1:30-3:00 Declaration PP05

**Paper Session 5**

*Classroom environments*

*Creating 'easy' and 'difficult' children: How teachers' perspectives influence children's development in school.*

Vera Maria Ramos de Vasconcellos, Universidade Federal Fluminense

Ana Carolina Monerat Fioravanti, Universidade Federal Fluminense

Suely de Almeida Batista Dessandre, Universidade Federal Fluminense

Fl-via Maria Cabral de Almeida, Universidade Federal Fluminense

This research compares teachers' perspectives, measured by the use of the concepts ideal child, autonomy and personal freedom, of a group of 21 children at two moments of their school life: 5 to 6 years and 10 to 11 years. Nucci's concept of Morality Development and Piaget's notion of Moral Autonomy were used in the analysis. The results show that both groups of teachers used the concepts of autonomy and personal freedom, the first group overrating the children's autonomy, while the second group's descriptions agreed with the forecast of their academic performance, suggesting a causal relationship between pre-school teachers' perceptions and children's development.

*The embodied classroom (it ain't just information)*

David W. Kritt, College of Staten Island/CUNY

Lucien T. Winegar, Susquehanna University

The use of the Internet to enhance teaching and learning is examined from constructivist and co-constructivist perspectives. Intellectual habits and styles promoted by the Internet are examined. Learning in a virtual environment is contrasted with the exploration of physical objects and active, immediate interaction with others. The importance of socio-emotional aspects of learning assumes a prominent place in this critique.

*The impact of teaching styles and beliefs on the integration of a preschool storytelling and story-acting practice: Implications for promoting children's narrative and pretend play development*

Elizabeth Richner, Lehigh University

Ageliki Nicolopoulou, Lehigh University

This study compared two preschool classrooms which employed in their curricula a regular storytelling and story-acting practice, and found that teachers' differing pedagogical beliefs and classroom styles led to significant differences in both the implementation and effects of this practice. One teacher focused on using storytelling and other activities to promote individual children's intellectual and emotional development. The other teacher conceived and structured classroom activities as arenas for peer interaction and collaboration. Findings indicated that there was greater thematic cross-fertilization between, and greater complexity of, children's social pretend play and storytelling in the second class.

*How students and teacher negotiated interpretations of computer-based visual representations in a middle-school science curriculum*

Marianne Wiser, Clark University

Tamer G. Amin, Clark University

We seek to integrate two views of science learning -as the construction of conceptual structures and as participation in scientific practices,- by developing a multifaceted framework for studying physics learning using computer-based conceptual models. In this framework we distinguish two aspects of conceptual restructuring: understanding the computer -based models qua models and internalizing these models as the scientist's way to construe the physical world. Using a case study in which four eighth-graders learned basic thermal physics by interacting with each other, ourselves, and computer models, we argue that two different types of interaction between students and teacher (symmetric and asymmetric) support these different kinds of restructuring.

Moderator: Jeremy Carpendale, Simon Fraser University

1:30-3:00

Constitution PP06

### **Paper Session 6**

#### *Methodological issues*

*Designing educational software to improve visual-spatial ability: implications for theory, measurement, and design.*

David A. Stevens, Lexia Learning Systems  
 Michael W. Connell, Harvard University  
 Paul Schwarz, Lexia Learning Systems  
 Roy Pardi, Harvard University  
 Beth Pilgrim, Lexia Learning Systems

Many classroom interventions have sought to improve students' thinking skills. Yet only a handful has achieved measurable improvements in cognitive skill and academic performance relative to control groups. Interestingly, most of these share a common conceptual foundation -- Piaget's theory of the construction of knowledge. Unfortunately, there are considerable obstacles that prevent these interventions from becoming widely replicable. This paper presents the results from a project that is designing educational software based on the common principles of interventions that have improved general cognitive skills. Specifically, this paper examines the suitability of educational software for promoting visual-spatial development.

*Rasch Analysis and Zimbabwean Validation of the Kent Infant Development Scale*

Gwen Bredendieck Fischer, Hiram College

Rasch analyses of the Kent Infant Development Scale (KIDS) normative sample (N=704) tested item and person location stability using 5 different-sized non-overlapping samples, randomly selected from the 704. Compared with the large sample, person (not item) locations were stable in smaller samples. Item locations approached convergence with the normative sample at N=200. KIDS and a parent-practices questionnaire were administered to a Zimbabwean sample. Rasch analysis (comparing samples from two countries) suggests that Zimbabwean and U.S. infants develop behaviors in different orders and ages. Individual person-by-item analyses suggest misfit items are culturally inappropriate.

*Why longitudinal research is impossible for cognitive strategies and what to do instead*

Jan Boom, Universiteit Utrecht

The same task cannot be used repeatedly in a longitudinal study of strategies. Remedying this problem by sophisticated designs or by Rasch scaling is not enough because every assessment is an intervention that may induce changes in strategies within days as microgenetic research has shown. My hypothesis is that strategies found in microgenetic studies for cognitive tasks display a distinct morphology

in their time evolution over days that is basically isomorphic to the morphology found in cross-sectional studies over years. I will discuss plans to use recent powerful estimation procedures to fit this model to multiwave cross-sectional data.

*Psychotechnologies: Electric Agents as Embodied Media*

Adrian Guzman, University of Toronto  
Vinicius Andrade Pereira, University of Toronto

This paper is related with answering two questions: why are necessary elements of embodied signs? how are we to proceed in electric media studies related to mind? Electric agents more specifically, topologies of signs, are appropriate envelopings for embodied media. The necessary elements of the signs of these agents are then those of embodied media as well. A experimental proposal is presented as to how proceed with such a study. This proposal includes a interdisciplinary employment of an engineering approach and a semiotics approach. It also proposes the exploration of usability spaces. A general sign for a electrical agent its outlined and discussed.

Moderator: Jean-Louis Gariepy, Univ. North Carolina - Chapel Hill

3:00-3:15

Break

3:15-4:45

Liberty A

PP07

**Paper Session 7**

*Adolescent development in cultural contexts*

*Cultural influences on suicide rates among aboriginal youth*

Chris Lalonde, University of Victoria

The aboriginal people of Canada suffer the highest suicide rate of any identifiable cultural group in world. Previous efforts to explain this gruesome fact amount to a "deficit view" that focuses all but exclusively on socio-economic and psychological variables such as poverty, transience, substance abuse, and depression that are said to be associated with higher rates of suicide in general and to be somehow more characteristic of aboriginal persons in particular. Using population data, we demonstrate that suicide rates among aboriginal persons are better predicted by cultural and political variables that measure the extent to which aboriginal groups have been able to preserve and promote their own culture and to control their own community life.

*The shaping power of environment: An exploration of the structure of psychosocial development in urban adolescents.*

Sandra L. Fraley, Harvard Graduate School of Education

The constructivist approach to developmental psychology implicitly acknowledges the shaping role of environment. Still, the power of the environment to shape lives may be underplayed unless theoretical and empirical analysis is context specific. This paper integrates the theoretical work of Robert Selman and Kurt Fischer to explore the structure of urban adolescents' psychosocial development. What is the variation in psychosocial development across a sample of urban youth? Does an adolescent cohorts' psychosocial development fluctuate with changes in the urban environment, such as increases in levels of violence? Finally, how might psychosocial development relate to the construction of other developmental tasks?

*Dialectics of body, gender, and sexuality: A performative model*

Libby Balter Blume, University of Detroit Mercy

This theoretical paper interrogates social theories of the body, psychological gender schema theories, and feminist poststructural theories. First, I selectively review existing theories on the social



construction of gender. Second, I deconstruct assumptions about agency, constructivism, and contextualism in gender research from the perspective of play and practice theories. Third, I propose a theoretical model to reconceptualize the social construction of gender around dialectical issues rather than sex/gender categories. A dialectics of gender describes multiple, transitory identifications with the cultural discourse--discursive experiences that are lived by parents and children as they continually renegotiate body, gender, and sexual identities.

Discussant: Michael Nakkula, Harvard University

3:15-4:45      Liberty B      SY07

**Symposium Session 7**

*Activity Theory and the Embodied Mind*

Organizer: Anna Stetsenko, CUNY Graduate Center

The traditional cognitivist notion of the mind as an information processing device located "under the skull" and separated from the world has been recently criticized from several directions. This challenge continues to exist today in disciplines as diverse as cultural-historical activity theory, feminist theory, post-modern theories, and recent branches of cognitive science. Central to these approaches is the recognition that the body should be included in the study of the mind.

The goal of this symposium is to present the activity theory (AT) notion of the mind as emerging through embodied goal-directed collaborative activities embedded in environments constituted by physical and sociocultural objects. By focusing on activity as a molar unit of analysis of human subjectivity, the role of the body in constituting mental phenomena can be ultimately construed in theoretically coherent and non-reductionist ways that avoid the pitfalls of traditional views of the mind as a disembodied and essentially individual device. Moreover, we argue that AT allows for a synthesis of recent theoretical advances made in several interdisciplinary fields vis-a-vis the idea of embodiment of the mind. The first paper addresses the issue of the embodiment of the mind within cultural-historical activity theory with an emphasis on human mind as a process that emerges in the interactions between the living beings and their environment mediated by sociocultural forms of relating to the world, and that implicates intentional, acting, and embodied agent. The second paper examines the role of the body in relation to a specific type of human activity, substance abuse, as included in larger systems of activity. The third paper focuses on the role of bodies as cultural tools in the process of self development in children in the socio-physical context of a school.

*The embodied mind in its conceptualization within the cultural-historical activity theory.*

Anna Stetsenko, CUNY Graduate Center

*Body use (and abuse) in the activities of women recovering from addiction to drugs.*

Eduardo Vianna, CUNY Graduate Center

*The role of the child's body in the process of the developing self within the context of the socio-physical environment.*

Dusana Podlucka, CUNY Graduate Center

- 3:15-4:45 Liberty C DS02 **Discussion Session 2**  
*Embodiment from a cultural and psychological perspective: A discussion focusing on Piaget's book "The Origins of Intelligence" featuring Thomas J. Csordas, Lynn S. Liben, and Esther Thelen.*
- 3:15-4:45 Declaration PP08 **Paper Session 8**  
*Cognitive development and pedagogy*  
*Understanding of Abstract Definitions: A case of visual-based instruction vs. traditional instruction.*  
 Hamide Dogan, University of Texas at El Paso  
*Fostering cognitive skill development*  
 David Dean, Columbia University  
 Deanna Kuhn, Columbia University
- This project focuses on several component questions underlying the use of methods for scaffolding the development of knowledge acquisition skills integral to critical and creative thinking through inquiry learning techniques. Working with inner-city middle school children, this project involved tracking that development and testing various methodologies for strengthening the use of appropriate and effective cognitive skills for critical thinking. The outcomes of this investigation should be of use to both educators and developers of instructional aids as those outcomes provide support for inquiry learning techniques and indications of how best to encourage their development.
- The embodiment of the x-axis: An impediment to students' learning of slope*  
 Mindy Kalchman, Northwestern University  
*Intersubjective reciprocity as the source of reversible thought.*  
 Gustavo Faigenbaum, University of Buenos Aires
- This paper examines the analogy between norms of reciprocity that regulate exchange among individuals, and norms of reversibility that organize logical thought. Piaget first formulated this analogy in his book on Moral Judgment, and suggested that reciprocity embodied in peer interaction was central for an account of the genesis of logical reversibility. He came back to this issue in his Sociological Studies. I will discuss empirical and theoretical alternatives (sociocognitive conflict research, investigation of children's peer cultures) for exploring the implications of this analogy.
- Moderator: Vera Vasconcellos, Universidade Federal Fluminense
- 3:15-4:45 Constitution PP09 **Paper Session 9**  
*Integrating theories of cognition and reasoning*  
*Analysis of reasoning*  
 Mariam Thalos, University of Utah
- Descartes held that reasoning is a universal—that is to say, an all-purpose—instrument, capable of application to every kind of problem that can be faced. David Hume, by contrast, maintained that the all-purpose machine is impossible, on grounds that there can be no such thing as a rule for generalization that admits of application in all contexts in which knowledge is sought for the sake of guiding action. I shall argue there is a way to harmonize these 2 positions, by introducing distinctions that enable a finer-grained perspective on this thing called 'reasoning.'

*Developmental Metaphysics: Embodiment and the metaphor roots of Mathematics and Science*

Robert Kalechofsky, Salem State College

The view that cognitive processes are embodied as metaphors in our brains is the basis for a philosophy of mathematics which sees mathematical ideas as metaphors and cognitive processes in our brains. This opposes the Platonic views of mathematicians who consider mathematical ideas as existing in some other realm. In addition, erring is viewed as a potentially creative process forming new metaphors (accommodation). Paradigms substantiating this view that metaphor and error are at the roots of knowing processes (following the ideas of Piaget and Lakoff) are sketched in the work of Einstein, Cauchy and Aristotle.

*A more Darwinian version of constructivism*

Joe Becker, University of Illinois at Chicago

The predominant version of constructivist theory of cognitive development is Lamarckian: the cognitive work directed towards solving a problem drives cognitive development. This derives from Piaget's emphasis on disequilibrium. However, the idea that cognitive development derives from the attempt to solve a problem or overcome an impasse is challenged by two lines of argument, one empirical and the other theoretical. The paper presents a Darwinian version of constructivist theory that is not open to these challenges. In this version, new scheme-scheme coordinations arise independently of their better efficacy as instruments for coping with the empirically known world.

*Development as recombination*

Dimitris Papadopoulos, Free University of Berlin

Development is not a natural fact: it is neither an intrinsic feature of individual organisms nor reflects the fundamental mechanics of population systems. Conceptions of development render aspects of our reality meaningful, visible, and moreover, amenable to codification and management according to our positions in knowledge-systems and social landscapes. Thus, development is social contingent and constitutes a form of social technology. But even these theories which reject an objectivist approach to development—such as accounts on embodiment—tend to neglect the overarching consequences of the claim for sociohistorical contingency. In accordance with this I will describe some possible features of a developmental theory and practice which understands itself as an active force of individual and social change.

4:45-5:00

Break

5:00-6:15

Liberty C

PL05

**Plenary Session 5***Representational Development and the Embodied Mind's Eye*

Lynn S. Liben, The Pennsylvania State University

As living animals, in general, we come to know our real world as we move through and experience it. Our knowing is therefore based not only on what is "out there" but also on what is "inside" our skeletal, visceral, and neural bodies. But as human beings, in particular, we also come to know our real world by creating, using, and sharing representational artifacts. The concept of embodiment will be used to approach the developmentally central question of how individuals come to understand representations as diverse as maps, photographs, and paintings.

**Saturday, June 8, A.M.**

9:00-4:30 Foyer  
 Indep. A  
 Indep. B  
 9:00-10:30 Liberty A SY08

**Registration** (all day)

Book Display

**Poster viewing** (authors will be present 1:30-3:00)**Symposium Session 8***The One Miracle View of Theory of Mind: The Devil is in the Details*

Organizer: Lynn S. Liben, The Pennsylvania State University

The "one miracle view" of theory of mind holds that at about four years of age, children suddenly achieve a representational theory of mind. The presenters in this symposium soundly reject this "off/on" view, arguing instead that developmental progressions in theory of mind are evident well beyond the age at which children first solve the false belief task. The first speaker presents data showing that between 6- and 12-years of age there is development in children's sensitivity to different types of social requests. More generally, an argument is presented that certain competencies in social interaction may be conceptualized as theory of mind in action. The second speaker addresses theory of mind through studies of understanding appearance/reality (A/R) distinctions. A conceptualization of developmentally-ordered classes of A/R tasks is offered and empirical data on children's (aged 6 and 8) and adults' success on such tasks are described. In addition, children's success on A/R tasks is examined in relation to assessments of the degree to which parents discuss alternative interpretations of graphics and interpersonal events. The third speaker addresses the puzzling state of the theory of mind literature in which it is claimed that children first achieve the insight that reality is open to multiple interpretations at age 4, or 7, or 11, or 16, or college years, and offers ways to integrate and reconcile alternative interpretations of epistemic development. Taken together, the symposium provides evidence from a variety of theory of mind traditions to show that developmental miracles occur long after children graduate from preschool.

*Social Interaction as Theory of Mind in Action*

Jeremy Carpendale, Simon Fraser University  
 Denise Goldbeck, Simon Fraser University  
 William Turnbull, Simon Fraser University

*Distinguishing Appearance (4-year-old mastery) from Reality (even adults struggle)*

Lynn S. Liben, The Pennsylvania State University  
 Lisa E. Szechter, The Pennsylvania State University

*Beatify This: Late Arriving Miracles in the Succession of Children's Developing Theories of Mind*

Michael Chandler, The University of British Columbia

9:00-10:30 Liberty B SY09

**Symposium Session 9***Hands on learning: An examination of how different embodied representations influence concept learning*

Organizer: Melissa Singer, University of Chicago  
 Discussant: Spencer Kelly, Colgate University

This symposium describes four studies that demonstrate how subjectively experienced action contributes to children's construction of conceptual knowledge. Subjectively experienced action, however, can come in many forms, levels of abstraction or representations. We ask in this symposium "Which form of embodied cognition contributes to knowledge construction?" The papers in this symposium examine four

forms of embodied cognitions: (1) the most direct, sensory-motor level of action, (2) a concrete, yet indirect, representation of action (i.e., gestural representation), (3) an abstract representation of action (i.e., verbal representation) and (4) an interpersonal representation of action (gestural and verbal representations exchanged during teaching interactions). In reflecting over the entire symposium, what emerges is the notion that representations that most resemble basic sensory-motor activity may be the most influential for construction of abstract knowledge. Implications for mechanisms of cognitive change will be discussed.

*Learning through doing: Performing and understanding goal-directed action in infancy*

Jessica Sommerville, University of Chicago  
Amanda Woodward, University of Chicago

*Making children gesture: What role does it play in thinking?*

Sara Broaders, University of Chicago  
Susan Goldin-Meadow, University of Chicago

*Levels of Embodiment and learning: "Do as I do not what I say"*

R. Breckinridge Church, Northeastern Illinois University  
Saba Ayman-Nolley, Northeastern Illinois University  
Elizabeth Gordon, Northeastern Illinois University

*Gesture as Embodied Cognition: Looking at one-on-one math tutorials*

Melissa Singer, University of Chicago  
Susan Goldin-Meadow, University of Chicago

9:00-10:30      Liberty C      SY10

**Symposium Session 10**

*Perspectives on embodied consciousness across the life span*

Organizer: Andrea Pantoja, California State University, Chico  
Organizer: Maria Lyra, Federal University of Pernambuco, Brazil  
Discussant: Chris Sinha, University of Southern Denmark, Odense

The increasing appearance of the term 'embodiment' within contemporary academic discourse has given rise to a multiplicity of theoretical perspectives on the discussion of the body and psychological functions. For some, embodied experience is interpreted from a linguistic model of meaning, and thus body experiences are conceived of as secondary to verbal praxis. Another perspective on embodiment includes cognitive science tradition where the body is regarded as an object, or a container, where psychological experience takes place. The focus tends to be on the consequences of having a particular body structure within a given environment. A third perspective on embodiment conceives the body as subject (instead of secondary object), emphasizing the phenomenology of the embodied experience, that is, of interactions and exchanges occurring within the field of bodily existence. Although these approaches appear to concur on the primacy of the organism-environment relationship, they differ on their respective views on the role of the body in this relationship. The four papers that compose this symposium aim to illustrate various perspectives on embodiment. Rooted on the phenomenological philosophy of Merleau-Ponty, Vedeler discusses the bodily origin of intentionality as emerging out of early social interactions. Lyra discusses the concepts of 'immediacy of feelings' and 'mediated sign functioning', proposing a dialogical movement that integrates these two aspects of human functioning. Seitz discusses how bodily movement is an important component of many cognitive skills (e.g., music improvisation and early metaphoric abilities in children), focusing on how dance-instruction might enhance spatial-temporal reasoning abilities in children. Finally, Fogel proposes the

concept of participatory memory as the embodied experience of re-living the past, describing conditions under which adults may access embodied participatory memories of infancy.

*The bodily origin of intentionality*

Dankert Vedeler, Norwegian University of Science and Technology

*Immediacy and mediacy of human functioning*

Maria C.D.P. de Lyra, Federal University of Pernambuco, Brazil

*Dance instruction and spatial-temporal reasoning abilities*

Jay A. Seitz, City University of New York

*Remembering infancy: Accessing our earliest experiences*

Alan Fogel, University of Utah

9:00-10:30 Declaration PP10

**Paper Session 10**

*Issues for education and educators*

*Learning to understand the world with young mathematicians and scientists eyes on Piaget's constructivism*

Judit Kerekes, College of Staten Island/CUNY

*The impact of skill theory and microdevelopment in designing science curricula*

Marc Schwartz, Harvard Graduate School of Education

This article argues for a new framework for curriculum development based on two relevant models from cognitive psychology. I use skill theory (Fischer, 1980), a neo-Piagetian model of development, and Perceptual Control Theory (Powers, 1973), a cognitive model for understanding behavior, as theoretical underpinnings for this new framework. The two-week science module, shaped by this framework, supported meaningful and significant growth in understanding. When compared with two more familiar strategies used in middle school science, I found that both failed to support any significant growth in understanding.

*Mentoring teachers: The embodied mind in situated professional development*

Sybillyn Jennings, The Sage Colleges

Karen Swan, The University at Albany

Ellen Meier, Columbia University

Margaret Cintorino, Rensselaer Polytechnic Institute

Lester Rubinfeld, Rensselaer Polytechnic Institute

This paper examines the process ten mentors engaged in as they worked side-by-side with 175 teachers in 14 schools, with the goal of helping teachers integrate learning technologies into instruction. We describe how mentors made sense of the task, how they negotiated their roles, drawing on varied experiences to recruit teachers' interest in using technology, and adjusting their goals to fit the school culture. We also describe how the teacher-learners participated in the process. Through the mentors' and teachers' eyes, we can see clearly the social foundations of learning on which the development of cognitive skill depends.

Discussant: Jeanette McCarthy Gallagher, Lehigh University

9:00-10:30 Constitution PP11

**Paper Session 11***Metatheory and metaconsciousness**James and Piaget: Two Varieties of Religious Experience*

Michel Ferrari, University of Toronto

For James, personal life is transformed through religious experiences. Thus we can have the 'Will to Believe' in a transcendent God. By contrast, Piaget considers the notion of a transcendent God a more primitive form of thought, both historically and psychologically. Piaget's views on religion transmute or shade into issues of moral reasoning from the 1930's onwards, and seems typical of scientists today. But as James (1902) says, it is the deep emotional peace and security of absolute faith—and its real power to inform personal lives—that remains a "live issue" for psychological and developmental science.

*Genetic epistemology of experimenter's agency*

Gerardo Hernandez, Cinvestav-smtc

Ricardo Quintero, Cinvestav

Luis Mauricio Rodriguez, Ciecás-IPN

Rationalists and empiricist have justified quite differently the role of experimentation in science, however, in both cases the experiment played the simple role of confirming or refuting theoretical ideas. Since Hacking reevaluated the role of experiment in science, several philosophers have seen an active experimenter in designing and performing experiments. In this view, the experiment is not just a questioning of nature, but an inquiry about what we can do with nature. We present a way by which genetic epistemology throws some light into the mechanism that leads manipulation in experiments into scientific theories.

*Metaconsciousness: A new look at Metacognition and its Embodiment*

Michel Ferrari, University of Toronto

Georges A. Potworowski, University of Toronto

Frank Marra, University of Toronto

Robin E. Sacks, University of Toronto

Metacognition (knowledge about and control of one's own cognition) has been discussed for decades, but early explanations were essentially information processing accounts of monitoring and control. How does recent work on consciousness and self-awareness add to our understanding of metacognition and how it is embodied? We suggest that integrating consciousness and metacognition generates a paradox between levels of consciousness and levels of control that a new model proposed here can resolve.

Discussant: TBA

10:30-10:45 Break

10:45-12:00 Liberty C PL06

**Plenary Session 6***Embodiment and the Sacred*

Thomas J. Csordas, Case Western Reserve University

William James based his famous study of religion on the most acute and extreme spiritual moments of religious geniuses, seeking the essence of religious experiences in those "which are most one-sided, exaggerated, and intense." The reverse strategy of seeking the minimal criterion of religious experience, the phenomenological kernel that is the origin of religious symbol and sentiment, can be just as productive. This kernel may be the sense of otherness first articulated by phenomenologists of religion. Contemporary theorizing on otherness - alterity - helps to clarify

that it is grounded in embodiment. Insofar as this embodied otherness is part of the structure of being-in-the-world, it makes religion possible and perhaps even necessary.



**Saturday, June 8, P.M.**

12:00-1:30 Lunch  
 12:00-1:30 Declaration BOD2  
 1:30-3:00 Liberty A SY11

**Board of Directors Meeting****Symposium Session 11***Cognitive and Biological Factors in Social Reasoning*

Organizer: Henry Markovits, Universite du Quebec a Montreal  
 Discussant: Paul Klaczynski, Pennsylvania State University

The study of reasoning has often been limited to logical or scientific domains. However, since the work of Cheng & Holyoak, Cosmides and others, there has been growing attention paid to the kinds of inferences made in social domains. This symposium presents research that examines both cognitive and evolutionary approaches to social reasoning. The first presentation looks at children's feelings about contract violation while taking into account the factor of power derived from developmental research (adult vs. peer) and biological relatedness, derived from evolutionary theories. First and fourth graders were asked about the feelings of guilt (violation) and anger (victim) and their intensity. The second presentation examines competition for use of a single toy among groups of same-sex peers. Two developmental patterns for regulating competition were detected. The first was an overall tendency towards greater equality. The second involved increasing differentiation of behavior according to context. The third presentation looks at intuitive predictions and judgments under uncertainty. The specific hypothesis was made that systematic judgmental biases appear to be due to an executive-inhibition failure in working memory. This hypothesis was tested using an experimental procedure in which 60 adults were trained to inhibit the classical conjunction bias on a frequency judgment task derived from Kahneman and Tversky. Results suggest that subjects traditionally labeled as "irrational" with respect to the classical rules of inductive reasoning are in fact "inefficient inhibitors". The final presentation examines children's and adolescents judgments about sharing behavior as a function of biological relatedness, quality of relationship, value of the shared resource and gender. Results are analyzed in terms of one of the key concepts in evolutionary approaches to behavioral ecology, that of a conditional strategy. Judgments were consistent with use of a conditional strategy that included all of the above factors across all ages.

*Guilt and anger in contract violation: the effect of different relationships*

Monika Keller, Max Planck Institute for Human Development  
 Clark Barrett, University of California at Los Angeles  
 Masanori Takezawa, Max Planck Institute for Human Development  
 Szymon Wichary, Jagellonian University

*The development of contextual rules for regulating peer competition for resources*

Joyce Benenson, McGill University

*Judgment under uncertainty and conjunction-fallacy inhibition training*

Sylvain Moutier, CNRS - CEA - Universit es de Caen & Paris 5

*The development of mental models of conditional strategies for sharing*

Henry Markovits, Universite du Quebec a Montreal

1:30-3:00 Liberty B SY12

**Symposium Session 12***The role of representation in children's mathematics*

Organizer: Peter Bryant, Oxford University  
 Organizer: Terezinha Nunes, Oxford Brookes University

The theme of the symposium is that children's solutions to mathematical problems strongly depend on the way that they represent these problems. We shall argue that children are more successful in understanding and solving mathematical problems if they can represent these problems in ways that are based on familiar schemas of action. The presentations by Bryant and Nunes and by Squire will make the claim that children's understanding of multiplication is based initially on one-to-many correspondence, while their understanding of division is based on sharing. Problems that children can represent in ways that fit with these schemas are quite easy for them to solve. Methods of instruction that encourage these representations are effective. Falcao and Coelho's presentation will demonstrate that that methods of teaching additive reasoning and aspects of algebra are also crucially affected by the ways in which known and unknown quantities are represented. The presentation by Nunes and Borba will deal with negative numbers, and will show how children can solve hitherto difficult negative numbers problems when they understand the need to represent positive and negative numbers differently. These results and conclusions are relevant to educational issues as well as to the theories about the development of mathematical understanding.

*Ratios and fractions in children's learning of intensive quantities*

Peter Bryant, University of Oxford  
Terezinha Nunes, Oxford Brookes University

*Representation, additive structures and algebraic activity among pre-school and second graders in elementary school*

Jorge Tarcisio da Rocha Falcao, Universidade Federal de Pernambuco  
Ana Coelho Vieira Selva, Universidade Federal de Pernambuco

*Children's representation of division problems*

Sarah B. Squire, University of Oxford

*The effect of systems of signs on children's reasoning about negative numbers*

Terezinha Nunes, Oxford Brookes University  
Rute Borba, Oxford Brookes University

1:30-3:00      Liberty C      IS03

**Invited Symposium 3**

Everyone is invited to the presentation of the *Jean Piaget Society Life-Time Achievement Awards* to Harry Beilin and Irving Sigel (Willis Overton presiding).

*Embodiment of Meaning*

Organizer: Irving Sigel, Educational Testing Service

The central theme of the presentations by Sigel and Shafrir address two facets of meaning making that is embodied in the developing individual. The first facet of the discussion by Sigel deals with meaning-making, and its significance for the development of representational competence. Representational competence refers to knowing that instances such as words, pictures, or mathematical notations can have equivalent meaning in spite of the difference in appearance; in effect, analogous to the Piagetian concept of conservation. The second facet will be a presentation by Shafrir on the meaning equivalence paradigm instantiated in a formal procedure to assess representational competence. The application of this tool to assess representational competence across knowledge domains will be demonstrated.

*Embodiment of Meaning: A Developmental Model*

Irving Sigel, Educational Testing Service

*Meaning Equivalence: A novel assessment methodology for deep comprehension in any content area*

Uri Shafir, University of Toronto

1:30-3:00

Indep. B

PS02

**Poster Session 2***Note: Posters will be available for viewing all day. Authors will attend from 1:30-3:00**1. Theory of mind: Is training contagious?*

Anne-Marie Melot, University Paris 5

Angeard Nathalie, University Paris 5

*2. Metacognitive activity and reading disability: Domain or task specific skill.*

Kavita L. Seeratan, University of Toronto/OISE

*3. Schizophrenic Thought Disorder in developmental perspective: Disturbance in generative processes of pre-linguistic meaning?*

Mette Vaever, University of Copenhagen

Josef Parnas, University of Copenhagen

*4. The developmental relations among perspective taking skills, language development, and cognitive flexibility in toddlers*

Ulrich Mueller, Pennsylvania State University

Philip D. Zelazo, University of Toronto

Douglas Frye, University of Pennsylvania

Dana Lieberman, University of Toronto

*5. The epistemological meaning of scientific instruments*

Luis Mauricio Rodriguez, Ciecvas, IPN

Gerardo Hernandez, Cinvestav, IPN

Ricardo Quintero, Cinvestav, IPN

*6. The concepts of success and failure embodied*

Caren Rawlins, The Graduate Center, City University of New York

*7. Can young children use their pointing gestures as a private tool for regulating their thought processes?*

Begoña Delgado Egido, UNED

Encarnación Sarriá Sánchez, UNED

Juan Carlos Gómez., University of St. Andrews

*8. Training Many-to-One Reasoning in Young Children*

Catherine Sophian, University of Hawaii at Manoa

Samara Madrid, University of Hawaii at Manoa

*9. Pretending and Planning in Children with Autism*

Lisa Gilotty, Children's National Medical Center

Linda J. Brandt, The George Washington University

Virginia S. Hornbeck, The George Washington University

*10. Does wisdom increase with age?*

Helena Maria d'Orey Marchand, Universidade de Lisboa

*11. Why fluctuations? Dynamic systems, emotions and developmental transitions*

Tom Hollenstein, Ontario Institute for Studies in Education

12. *The sophistication of structural knowledge through concept sorting tasks*

Hiroshi Maeda, International Christian University

13. *Children's misconceptions of language used to represent body and mind*

Jay G Hook, Harvard Law School

14. *Embodied number and 'Fu': A diachronic analysis of number representation in the Oksapmin of Papua New Guinea*

Geoffrey B. Saxe, University of California, Berkeley

Jody Esmonde, University of California, Berkeley

Clifton McIntosh, University of California, Berkeley

15. *Gesture as a window on children's beginning understanding of false belief*

Stephanie M. Carlson, University of Washington

Caron Cosser, University of Washington

Margaret Lemke, University of Washington

Antoinette Wong, University of Washington

16. *Are any nonhuman animals self-conscious?*

Mildred Funk, Roosevelt University

17. *Relating language and theory of mind: The case of bilingual children*

Christopher T. Fennell, University of British Columbia

Julie Belanger, University of British Columbia

18. *Self-Continuity in Personal Projects*

Monika Brandstätter, University of Victoria

Christopher E. Lalonde, University of Victoria

19. *Inferring a robot's false belief by young children - A preliminary report*

Shoji Itakura, Kyoto University

Takayoshi Kotani, Kyoto University

Hiraku Ishida, Kyoto University

Takayuki Kanda, ATR Media Information Science Laboratory

Hiroshi Ishiguro, Wakayama University

20. *Conceptual Perspective-Taking and its Associations with Visual Perspective-Taking Performance*

Alberto G. Sorongon, The George Washington University

Eugene Abravanel, The George Washington University

21. *Developing Social Roles through Pretend Play: A case study of a child with autism*

Amelia Rishworth, Clark University

Penelope G. Vinden, Clark University

22. *Acquiring an understanding of design: Evidence from 'functional fixedness' problems with novel objects.*

Tim P German, University of California, Santa Barbara

Margaret Anne Defeyter, University of Essex

23. *The varieties of being post-formal: Proposal of a meta-structure.*

Gabriel Bukobza Ophir, Harvard Graduate School of Education

24. *The effect of Cognitive-Visuo Training on Autistic Spectrum Children*

Tyish Hall, Vision and Conceptual Development Center

Matt Hiller, Vision and Conceptual Development Center

Stacey Kleckner, Vision and Conceptual Development Center  
 Harry Wachs, Vision and Conceptual Development Center  
 Swithin David, Vision and Conceptual Development Center

25. *Learning to Draw Recognizable Graphic Representations During Mother-Child Interactions*

Gregory S. Braswell, University of California, Santa Cruz  
 Maureen Callanan, University of California, Santa Cruz

26. *Changes in children's figure drawing following kinesthetic experience*

Lynda A. Kapsch, Georgia State University  
 Ann Cale Kruger, Georgia State University

27. *Young children's understanding of temporal expressions: the case of simultaneity*

Barbara Schmiedtova, Max-Planck-Institute for Psycholinguistics  
 Petra Gretsche, Max-Planck-Institute for Psycholinguistics

28. *Drawing: The effects of media on spatial representation*

Frank Gallo, University of Massachusetts at Boston  
 Claire Golomb, University of Massachusetts at Boston  
 Alessandra Barosso, Northeastern University

1:30-3:00 Declaration PP12

**Paper Session 12**

*Embodied mind in Piagetian perspective*

*The role of movement in perception, memory, mental imagery and intelligence according to Piaget considered as a paradigm for a Piagetian theory of the embodiment of mind*

Jacques Voneche, Archives Jean Piaget

This paper attempts to show how Piaget anticipated present theories of cognitive processes and how his views have been confirmed by recent discoveries in perception, memory, mental imagery and intelligence. In addition, the paper offers, on the basis of Piaget's specific findings and explanations, a general theory of the body as a mediator between the mind and the world and a new approach to the mind-body problem.

*Platonic themes in Piaget's "Mission of the Idea"*

Mark Schernwetter, Harvard Graduate School of Education

Plato's 'Socratic Method' seeks to acquire universal knowledge by separating the rational ideas of the mind from the emotions and desires of the body. I examine how a Platonic orientation is expressed in Piaget's early prose work, 'The Mission of the Idea' (1915), which was written when Piaget was only nineteen years old. I consider how the Platonic interests in Piaget's artful prose anticipate his move away from the issues he explored as an adolescent. I study how he transforms his emotionally imbued forms of expression into a scientific clinical method that identifies universal structures of thought underlying cognitive content.

*Piaget's stages revisited (and somewhat revised)*

David Henry Feldman, Tufts University

Although much criticized, Piaget's stages formed the backbone of his theory. In this paper, the basic form of the stages is preserved, but some of the most challenging problems have been addressed. Possible solutions to problems such as decalage, structures as a whole, the failure of many to reach formal operations, novelty and how it is possible, and the "immaculate transition" are borrowed from NeoPiagetian, Piagetian, Nonuniversal and Dynamic systems theories. This version of

the stages approaches the vision of an "embodied mind" that Piaget tried (but did not altogether succeed) to express.

Discussant: Gustavo Faigenbaum, University of Buenos Aires

1:30-3:00 Constitution PP13

**Paper Session 13**

*Biobehavioral systems theory*

*Issues of establishment, consolidation, and reorganization in biobehavioral adaptation*

Jean-Louis Gariépy, University of North Carolina at Chapel Hill

Experiments with mouse lines selectively bred for high and low aggression are presented to provide empirical evidence that development is dynamic and continuous. Instead of identifying antecedent factors predictive of individual differences at some pre-defined endpoint, these studies captured contemporaneous factors of maintenance, consolidation, and reorganization in established biobehavioral patterns. Results have relevance for understanding how, in evolution and development, innovative accommodations arise out of systemic organizations that otherwise favor conservation and continuity in biobehavioral adaptation.

*Anomalous self-experience in schizophrenia, intermodal integration, and cortical connectivity*

Pierre Bovet, University Department of Adult Psychiatry, Lausanne  
 Josef Parnas, University of Copenhagen  
 Pascal Vianin, Research Center of Psychiatric Neuroscience, Lausanne  
 Giorgio Innocenti, Karolinska Institutet

Pre-schizophrenic patients express subtle anomalies of self-experience, which might be indicative of deficient capacities of intermodal integration during infancy and childhood. Intermodal integration involves probably synchronous firing of spatially distributed neuronal assemblies. This "binding by synchrony" depends on precise geometry of cortico-cortical connections. We suggest that the neurodevelopmentally determined vulnerability to schizophrenia would be reflected at the anatomical level by abnormal cortico-cortical connectivity, at the neuropsychological level by deficient intra- and intermodal integration, and at the clinical level by premorbid features suggestive of developmental anomalies in multiple domains, including the development of sense of Self.

*Systemic Theory and Learning Disabilities: A Reexamination of the Construct that Created "Disabled" Learners*

Betsey Grobecker, Independent Consultant

From a systemic perspective of life, structures of organizing activity (self-regulating, self-amplifying, and self-organizing nonlinear feedback loops of neural activity) evolve through multiple interacting processes within and between evolving systems. Structural networks that lack expansion in form are characterized as hierarchical organizations that have a low degree of structural plasticity. This decreased degree of internal order (or complexity) will not generate the degree of instability in the total system necessary to form a higher-order autopoietic system from lower-order autopoietic systems at the expected time. As a result, learning "differences" are manifested.

Moderator: Clary Milnitsky, Universidade Federal do Rio Grande do Sul

3:00-3:15

Break

3:15-4:45

Liberty A

SY13

**Symposium Session 13***Epistemology in Action: Naturalism, Infancy, and Robotics*

Organizer: Timothy P. Racine, Simon Fraser University

Those who subscribe to a constructivist epistemology assume that thought originates in action. In this symposium, we argue that: (a) social interaction is critical for the development of knowledge; and, (b) an action-based (constructivist) epistemology can provide a more adequate account of the emergence of knowledge forms. We believe that the dependence of development upon activity has far reaching consequences, which we take to include the avoidance of some of the problems inherent in a naive empiricism or nativism. In order to anchor the symposium theme, Kitchener begins by arguing that although naturalistic and normative epistemology have traditionally been seen as incompatible due to the distinction between fact and norm, Piaget's genetic epistemology, which is rooted in social interaction, can bridge the divide between the normative and the naturalistic. In order to critique contemporary theories of social understanding, Racine then draws upon Wittgenstein to analyze the grammar of intention. In contradistinction to those who would argue that joint attention requires the development of an understanding of intentional mental states, Racine argues it is problematic to assume that such states can exist and uses this to justify an action-based account of development. Carpendale and Mueller then evaluate contemporary approaches to pointing in infancy by examining the epistemological frameworks from which these accounts begin. They critique approaches that are based on an individualist framework and suggest that a relational framework, drawing on Baldwin, Piaget, and Vygotsky, is more fruitful. Finally, Davies and Racine argue that disembodied approaches to artificial intelligence suffer as a result of not considering the developing agent in their models. Although they commend embodied behavior-based approaches for emphasizing the role of social interaction in the development of knowledge, they critique and reinterpret the use of modular models of social development in such programmes.

*Genetic Epistemology: Normative Epistemology vs. Naturalistic Epistemology*

Richard F. Kitchener, Colorado State University

*Intention, Mental States and Development*

Timothy P. Racine, Simon Fraser University

*The Point of the Point: The Development of Pointing in Infancy*

Jeremy I. M. Carpendale, Simon Fraser University

Ulrich Mueller, Pennsylvania State University

*Coming to Terms with the Application of Developmental Theory to Artificial Intelligence*

A. Rhian Davies, Simon Fraser University

Timothy P. Racine, Simon Fraser University

3:15-4:45

Liberty B

PP14

**Paper Session 14***Theory of mind**The metaphorical bases of children's Theories of Mind*

Bayta L. Maring, University of Oregon

Marjorie Taylor, University of Oregon

Some philosophers propose that humans understand all abstract concepts by mapping them onto concrete objects via metaphor. This paper focuses on how theory of mind development might consist of shifts in conceptual metaphors for the mind. Between the ages of five and seven children begin to understand that beliefs are not passively received but actively constructed. We proposed that this development represents a change from using a MIND AS CONTAINER metaphor to using a MIND AS HOMUNCULUS metaphor. Results from our first study show that five-year-olds understand MIND AS CONTAINER metaphors significantly better than MIND AS HOMUNCULUS metaphors.

*Epistemological recursion: Epistemic development regarding institutional facts versus brute facts*

Darcy Hallett, University of British Columbia  
Michael J. Chandler, University of British Columbia

Recent research has suggested that epistemological development is actually a recursive process that young persons, typically in the teenage ages, apply to matters of 'social' or 'institutional' facts before they make the same allowance for matters of 'hard' or 'brute' facts, which usually an achievement of the college years. To further investigate these findings, a sample of university students and high school students were given a semi-structured interview designed to include both matters of institutional and brute fact. Results suggest that young persons do treat knowledge of differing epistemic content in significantly different ways.

*Chinese and American children's developing understanding of knowledge*

David Liu, University of Michigan  
Henry M. Wellman, University of Michigan  
Twila Tardif, Chinese University of Hong Kong  
Kitty Fong Yau Fung, Chinese University of Hong Kong

Knowing about knowing is a universally important cognitive task. Development of an understanding of knowledge may differ for knowing-that and knowing-how and for Chinese and American children. We asked Chinese and American children to judge their own and others' states of knowledge. We found that this understanding's development demonstrates not only the influence of common developmental trends (e.g., understanding knowing-that before knowing-how) but also the impact of different cultural emphases (e.g., conceptions of one's own versus others' procedural knowledge in Chinese and American children).

*What happens in your head when you think?: Theory of the mind.*

Jose de Vincenzo, National Louis University  
Marilei D. Leme, Universidade de Santo Amaro  
Isabela Sousa, Osvado Cruz Foundation  
Judith Lanni-Ruggeri, National Louis University

A sample of 283 children from Brazil and the United States, ranging in age from 7 to 12 years, responded graphically and verbally to the question "What happens in your head when you think?" Analysis of the data suggests gender, developmental, and cultural differences. A sample of their productions will be included in the presentation.

Moderator: Analia Ribeiro, Federal University of Pernambuco

3:15-4:45      Liberty C      IS04

#### **Invited Symposium 4**

*Perspectives on the early development of consciousness.*

Organizer: Philip D. Zelazo, University of Toronto

This symposium brings together researchers who are addressing the development of consciousness in various ways and in various contexts,



and asks them to do 3 things: (1) provide a working definition of consciousness (or working definitions); (2) discuss how (and why) they make inferences about consciousness on the basis of behavioral data; and (3) compare their perspectives to those of the other participants.

*The developing self and development.*

Michael Lewis, Robert Wood Johnson Medical School

The development of the self—a mental construct—occurs around the middle of the second year of life and serves to organize the child's cognitive, social, and emotional life. By using this mental construct consciousness or the knowledge of one's existence—the integration of most domains of knowledge is possible.

*Levels of consciousness in childhood*

Philip D. Zelazo, University of Toronto

In this talk, I will review the main points of the Levels of Consciousness model (e.g., Zelazo, 1999; Zelazo & Zelazo, 1998). These include: (1) a characterization of the key features of neonatal consciousness, (2) the suggestion that by assuming a particular characterization of neonatal consciousness and combining it with the functional process of recursion, one can trace the development of consciousness through several levels, and (3) a discussion of how these levels explain age-related abulic dissociations between "knowing" and "doing," as well as other developmental phenomena. Indeed, it is argued that we must introduce the notion of multiple levels of consciousness to explain these important phenomena. Failure to take a developmental approach has led to reliance on unitary (non-conscious vs. conscious), or at most binary (non-conscious vs. [conscious vs. self-conscious]), notions of consciousness.

*Consciousness and Intentional Relations: A Developmental Perspective*

John Barresi, Dalhousie University

Chris Moore, Dalhousie University

Infants have consciousness in the primary sense of intentional awareness of objects. But they do not have consciousness in the secondary sense of being reflectively aware of their own consciousness. We present a three-stage account of the development of reflective consciousness: Toward the end of the first year, infants become reflectively aware of shared intentional activity with others, and by the end of the second year, distinguish their own intentional activities, from those of others. But, it is not until the end of the third year, that toddlers become aware of conscious mental states as such, thus becoming reflectively self-conscious.

3:15-4:45 Declaration PP15

**Paper Session 15**

*Math and science education*

*An instrumental approach to mathematical concepts learning: A case study on geometry*

Alex Sandro Gomes, Centro de Informatica, UFPE

Our aim is to achieve the mathematical knowledge construction that emerges to individual activities with artifacts. The concept of instrument - defined by Mounoud and extended by Rabardel seems not to be adequate. We redefined instrument, substituting the original scheme with one defined by Vergnaud, including an knowledge elements to the model. We proposed geometric problems to be solved with rule and compass and with CABRI GÈomÈtre software. We observed 10 pupils, from 11 to 13 years old. As results, different artifacts promoted different

subsets of mathematical knowledge. Materials define different learning possibilities.

*Learning to see mathematics: The role of visual representations in negotiating mathematical meanings in first grade.*

Lucia M. Flevares, University of Illinois at Urbana-Champaign  
Michelle Perry, University of Illinois at Urbana-Champaign

Learning mathematics in school entails the acquisition of mathematical forms of representation and communication. In the present study we observed first-grade lessons and focused on the negotiations of mathematical meanings through visual and verbal means. The negotiations occurred through discussions of students' errors, disagreements, confusion, and corrections of mathematical representations. Teachers and students used a variety of representational forms to express mathematical meanings, and their use of these forms increased following the occurrence of a student's error, confusion, disagreement or correction. Teachers' actions often drew attention to specific features of a visual representation to support students' representational understanding.

*Functional relationships between conceptual and procedural knowledge: The role of knowledge characteristics*

Hsin-mei Liao, University of Illinois at Urbana-Champaign

This research investigated the role of knowledge characteristics in determining the functional relationship between conceptual and procedural knowledge. 35 and 36 children between age 2.5 and 3.5 participated in the first and the second study, respectively. Each was interviewed with tasks that measured conceptual competencies in cardinality, addition, and subtraction and computational competence in addition and subtraction. The results indicate that the functional relationship may be different when the scopes of the conceptual and procedural knowledge change. Furthermore, a prerequisite relation is more likely when the conceptual and procedural dyads are from two distant hierarchies of the knowledge structure.

*Casting an anchor before floating off—the shift from simple to complex reasoning*

Sharona T. Levy, Tel-Aviv University

This study explores children's learning while gaining practice in building operating water pipe systems. In the talk, the focus will be on the processes through which reasoning increases complexity in service of a higher coherence with system behavior. Kindergarten children constructed four different hierarchically controlled water systems, based on increasingly complex combinations of three physical relations. It was found that learning of complex phenomena progressed through a unification of reasoning by increasing consistency before releasing this consistency in order to explore additional dimensions and finally integrate the various dimensions into a single framework.

Moderator: Carolyn Hildebrandt, University of Northern Iowa

3:15-4:45 Constitution PP16

### **Paper Session 16**

*Embodiment, creativity, and phenomenology*

*Embodiment as phenomenological concept*

Gabriela Rizo, Universidade do Estado do Rio de Janeiro  
Alexandra Tsallis, Universidade do Estado do Rio de Janeiro

The Merleau-Ponty phenomenology is discussed in psychology, anthropology and other disciplines. In this paper we argue about the

concept of embodiment proposed by Csordas and the articulation with psychology. This concept is based on the human vision as a being-in-the-world and on the conception of body as a social inscription, both being fruitful dimensions for psychology. The concept of embodiment is intended to serve, in some way, as a device of analysis of the social phenomena and as creative way out in order to overcome the mind-body dualism and the priority of the reason.

*Music as Embodied Cognition*

Jeanne Bamberger, Massachusetts Institute of Technology

Children's earliest invented notations for rhythm initially embody their actions in continuous scribbles; interrupting these action paths, notations become bounded, structural gestures, then measured, classified, discrete objects. This is taken as a process of selectively interrupting the passage of actions/events unfolding through time to make distinctions, classify, and name. I argue that insight subsequently occurs when boundaries of conformant distinctions are made permeable: performing musicians, for example, embodying composers' "ideas," animate distinctions held by static symbols, shaping and re-shaping contiguous events into structural gestures in response to unique context, thus expressively projecting feeling and meaning.

*Creativity and the Biology of Technology: From spider webs and beaver dams to knowledge engineers and computerized Bach.*

Iris Stammberger, Tufts University

All forms of creativity are related. From spider webs, beaver dams and ant farms to knowledge engineers and computerized Bach, all forms of creativity result from the algorithmic process of evolutionary change by which biological organisms differ in the way they extend their minds into the environment creating technology - a prosthesis by which they change their ability to act in the world. In this paper, after showing how findings in creativity research find unifying theoretical ground in cognitive naturalism - the perspective that the mind is embodied lived experience arising in the context of evolutionary history -, I argue for an agenda for the study of creativity as the study of the biology of technology.

Discussant: Peter Pufall, Smith College

4:45-5:00

Break

5:00-6:15

Liberty C

PL05

**Plenary Session 7**

*Developmental Origins of the Embodied Mind*

Esther Thelen, Indiana University

An embodied cognition arises from bodily interactions with the world and is continually meshed with them. I take a developmental view and reaffirm Piaget's fundamental message that cognition is built from the sensorimotor activities of infants. But I also suggest that skill is not only abstract thinking, but the also the ability to act, and to move rapidly and seamlessly between these two states. I use the argument of continuity between levels and time scales to suggest that dynamics is the appropriate language for a nested and coupled mind and body. Studies of infants and toddlers illustrate how bodily memories are a part of all cognition.

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