

Infant Intentions and Narratives of Shared Meaning

History is not Destiny
Brazilian Association of Psychoanalysis
São Paulo
Saturday 19th March 2022

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Two Types of Cognition (Bruner, 1990)

(1) Narrative

- 'line mode' (Donaldson, 1992)
- proceeds through time
- necessarily embodied
- built on the structure of experience
 - Situation, motivation, perception, action, and its result
- always coloured with vital affectivity

(2) Logico-scientific

- conceptual
- static, timeless
- becomes disembodied
- built on knowledge from experience
 - accumulation of the result of action
- abstract, generalised facts
 - not necessarily situated, affective, motivated, etc.

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“We choose to go to the moon,
*because that goal will serve to organize and measure the best of our
energies and skills,*
*because that challenge is one that we are willing to accept, one we
are unwilling to postpone,*
and one which we intend to win...”

(J. F. Kennedy, Rice University Speech, 12 September 1962)

Kennedy's Principle of Goal-Directed Social Organisation

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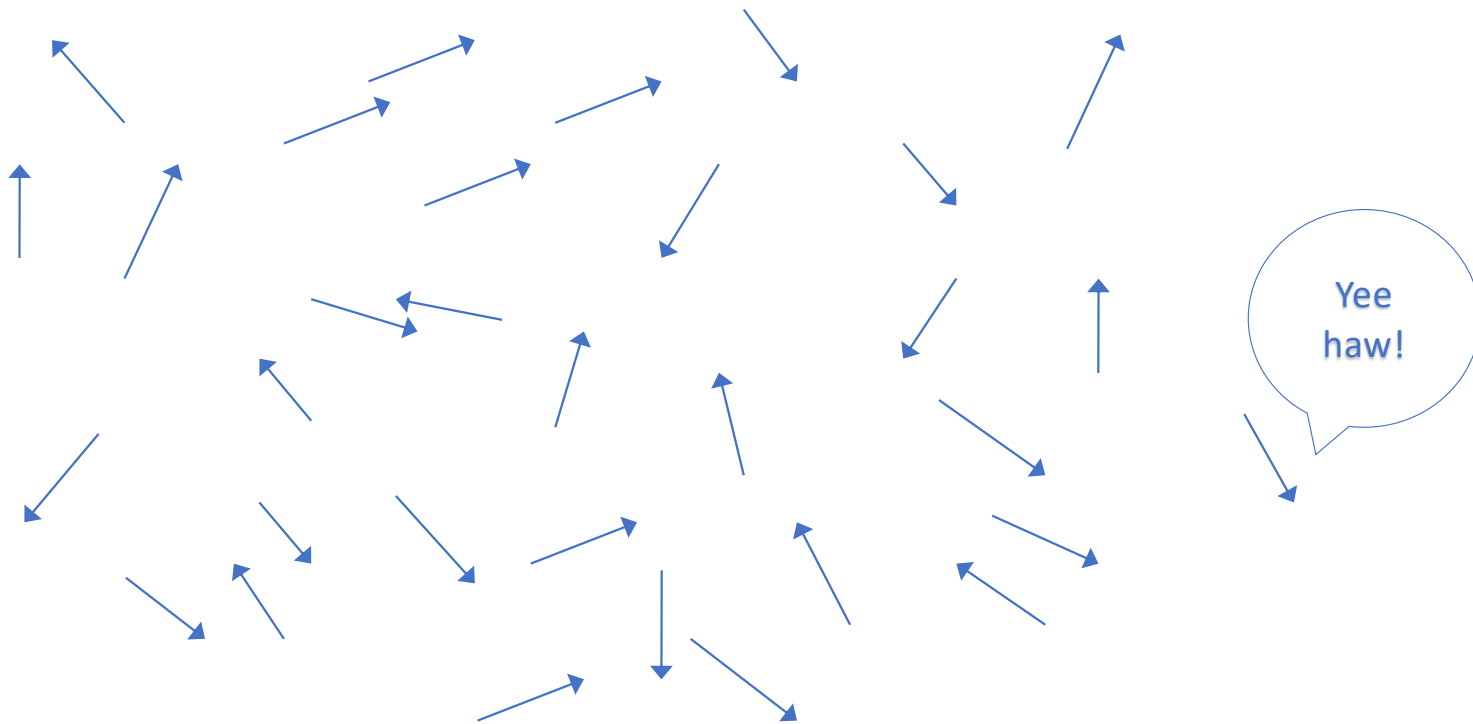
*because that challenge is one that we are **willing to accept**, one we are unwilling to **postpone**,*

*and one which **we intend to win...**”*

(J. F. Kennedy, Rice University Speech, 12 September 1962)

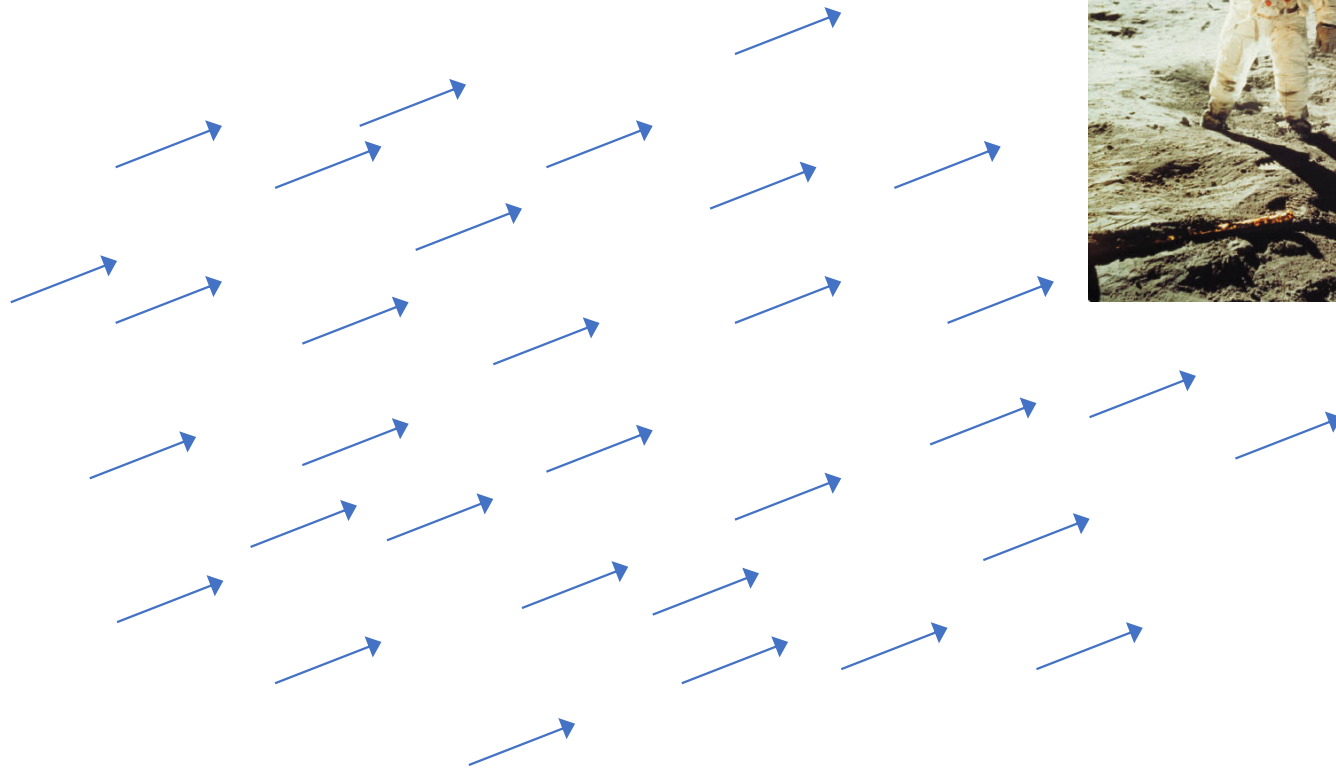
Kennedy's Principle of Goal-Directed Organisation

Independent Americans



Kennedy's Principle of Goal-Directed Organisation

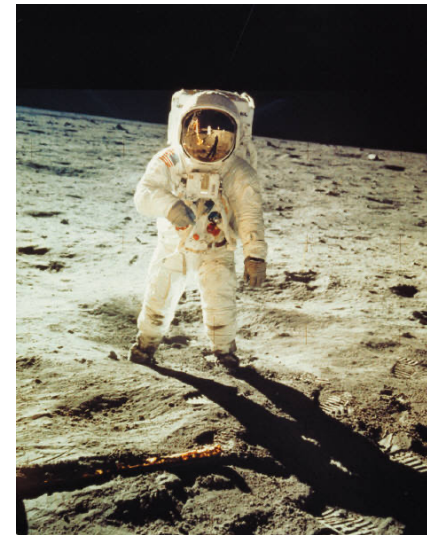
Americans with a Shared Goal



Kennedy's Principle of Goal-Directed Organisation

Americans with a Shared Goal

- A shared narrative project **between** individuals, and **within** them too.
- Generates **coherence** and synergistic **efficiencies, between and within.**
- **Shared timing** and **coordination** between bodies and minds
- Generates **shared value, understanding, and meaning** in **common purpose**





“Motor
coordination is
the sole product
of brain
function”

- *Roger Sperry (1952), Nobel Laureate*




“The inborn capacity of a human being to respond to interested company is sensitive to the rhythm and harmonies of human expressive *moving* and to the mimetic *narratives* of human *intention*”

- Colwyn Trevarthen, Prof. Child Psychology and Psychobiology, Harmony in Meaning (2007)





 [Nobelprize.org](https://www.nobelprize.org)

A photograph of a man with white hair, wearing a light blue short-sleeved button-down shirt and grey trousers, speaking into a microphone at a wooden podium. On the podium are a laptop and a small black device. Behind him is a large, dark, framed painting depicting a group of people. To the right, a large projection screen displays the text "Movement is the root of Communication" in a black serif font. In the foreground, the back of a person's head and shoulders is visible, looking towards the speaker. A name tag on a table in the background reads "David H. Lee".

Movement
is the root of
Communication

Overview – Fundamental Psychological Principles

- **Principle 1: I like to move it.**
 - Satisfaction in movement in acquiring 'goals'.
- **Principle 2: I like to move it with you!**
 - Satisfaction in coordinated interpersonal sensorimotor acts, *e.g.* dancing
- **Together: This gives meaning-making** and social understanding in intersubjective engagement

Mind in Movement

"Every mental phenomena is characterised by what the Scholastics of the Middle Ages called the **intentional** (or mental) inexistence of an object, and what we might call... reference to a content, direction toward an object... or immanent objectivity." (Franz Brentano, 1874, p. 88).

A Primary Sensorimotor Intentionality

Actions are Prospective by Necessity

- biomechanical inertial forces necessitate prospective control (Bernstein, 1967; von Hofsten, 1993; 2004)
- actions are expensive; to act economically and with adaptive effect they must be guided by prospective perception (von Hofsten 1993; 2004; Lee, 1998; 2009)
- all units of action must be 'goal'-directed (Lee 1998; 2009)

Toward a Primary Sensorimotor Intentionality

Brentano makes it clear that

“every mental phenomena includes something as object within itself” (1874, p. 88).

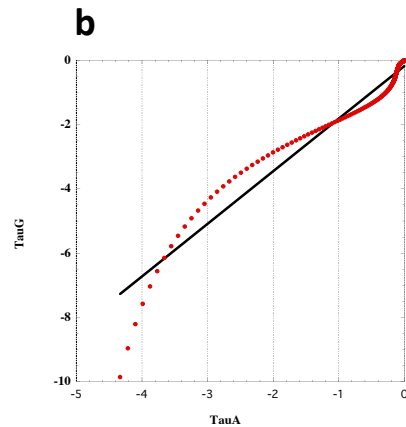
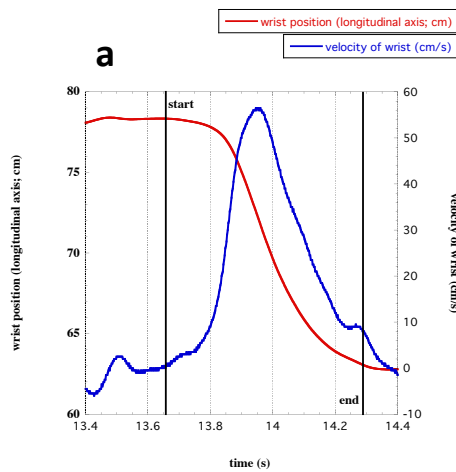
That ‘something as object’ is born of the necessity of prospective control.

Every action anticipates a ‘goal’, *ie. an object* or its consequent effect

Every action presumes a motor-sensory contingency



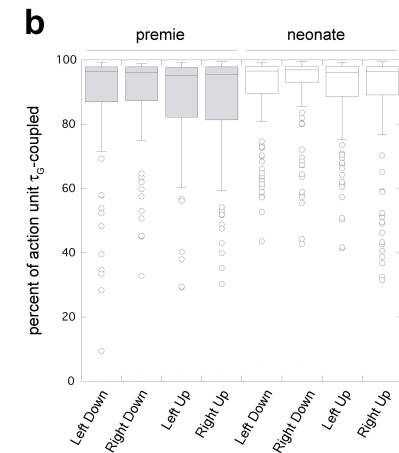
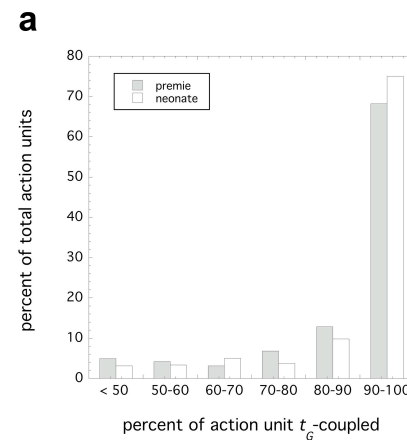
Prospective Control in Limb Movements



$$\tau_A = k \tau_G$$

$$\tau_G = 0.5(t-T^2/t)$$

$$\tau_A = k 0.5(t-T^2/t)$$



Delafeld-Butt, J. T., Freer, Y., Perkins, J., Skulina, D., Schögler, B., & Lee, D. N. (2018). Prospective organization of neonatal arm movements: A motor foundation of embodied agency, disrupted in premature birth. *Developmental Science*, 21(6), e12693. doi:doi:10.1111/desc.12693

Primary Sensorimotor Intentionality

Pre-reflective, pre-conceptual.

Future-oriented.

Simple.



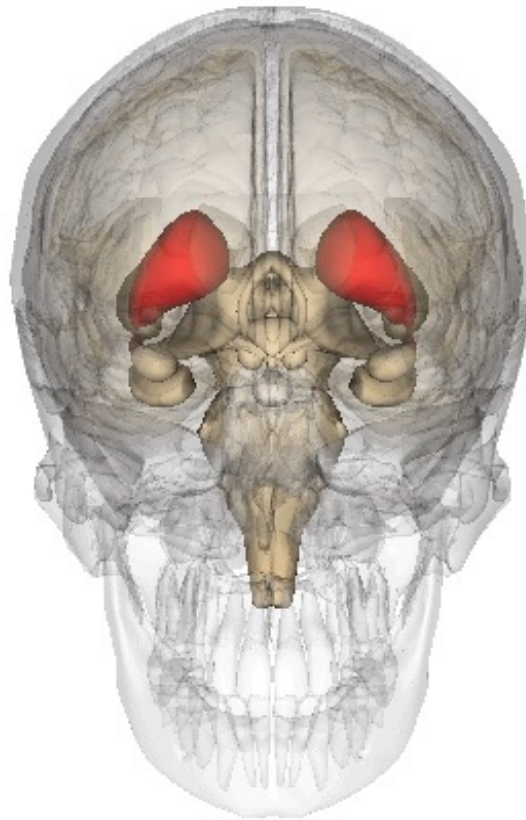
A decorative blue banner with a wavy shape. On the left, there are translucent dice. The banner contains various mathematical symbols like pi, infinity, and numbers. On the right, a baby in brown overalls is walking towards the left.

Intentional Agency Evident at Start of 2nd Trimester

- first tentative signs **at 8-10 weeks** in the first spontaneous, coordinated limb movements (de Vries, Visser, & Prechtl, 1982; Prechtl, 1986)
- discrimination in action patterns of limbs in **14 week** GA twins between twin-object-, and self-directed movements (Casteillo *et al.*, 2010)
- action-planning evident in kinematics by **18-22 weeks** GA (Zoia *et al.*, 2007)
- anticipation of self-directed actions (Myowa-Yamakoshi & Takeshita, 2006)
- behavioural evidence of ‘bicycling’, reaching, grasping, exploring, etc. (Piontelli, 2010)

Primary Consciousness: the Centrencephalic Me

- upper brain stem and midbrain region is seat of the integrative 'core self' (Merker, 2007; Northoff & Panksepp, 2008; Panksepp & Northoff, 2009; Panksepp, 2011)
- the Core SELF at the midbrain and upper brain stem is
anatomically subcortical, but
functionally supracortical. (Penfield & Jasper, 1954)
- connected to skeletomusculature by *ca.* 14 weeks G.A.
- controls primary prospective action
- conscious and acts with felt appraisal (Penfield & Jasper, 1954)
- site of affective learning and memory (Winn, 2012; Panksepp 1998)
- evidenced in anencephalic children
- and foetal prospective motor control before cortical lamination



Trevarthen, C., & Delafield-Butt, J. T. (2017). Development of Consciousness. In B. Hopkins, E. Geangu & S. Linkenauer (Eds.), *Cambridge Encyclopedia of Child Development* (pp. 821-835). Cambridge: Cambridge University Press.

Merker, B. (2007). Consciousness without a cerebral cortex: A challenge for neuroscience and medicine. *Behavioral and Brain Sciences*, 30, 63-134.

The Centrencephalic Me

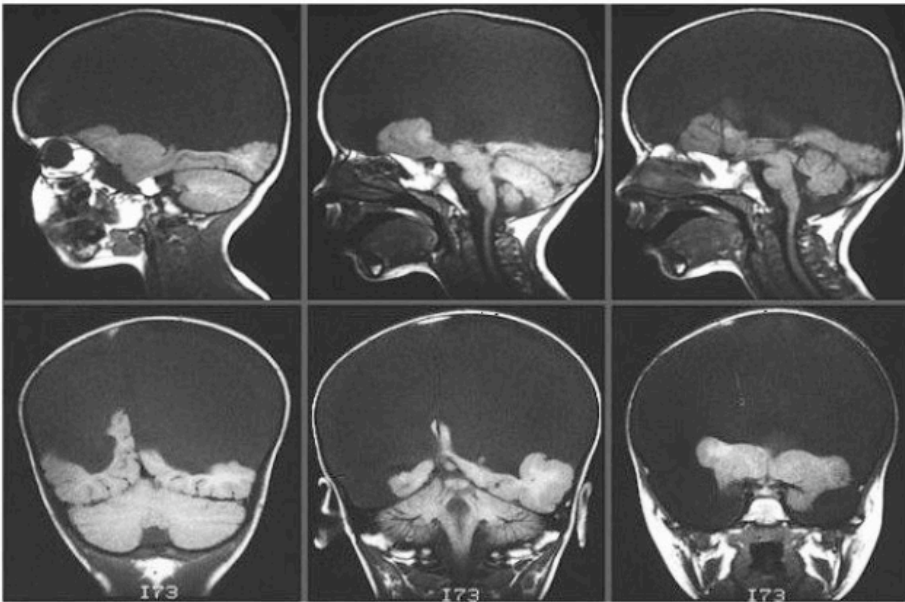


Figure 8. Saggittal and frontal magnetic resonance images of the head of a child with hydranencephaly. Spared ventromedial occipital and some midline cortical matter overlies an intact cerebellum and brainstem, while the rest of the cranium is filled with cerebrospinal fluid. Reprinted with the kind permission of the American College of Radiology (ACR Learning File, Neuroradiology, Edition 2, 2004).



Figure 9. The reaction of a three-year-old girl with hydranencephaly in a social situation in which her baby brother has been placed in her arms by her parents, who face her attentively and help support the baby while photographing.

The Centrencephalic Me

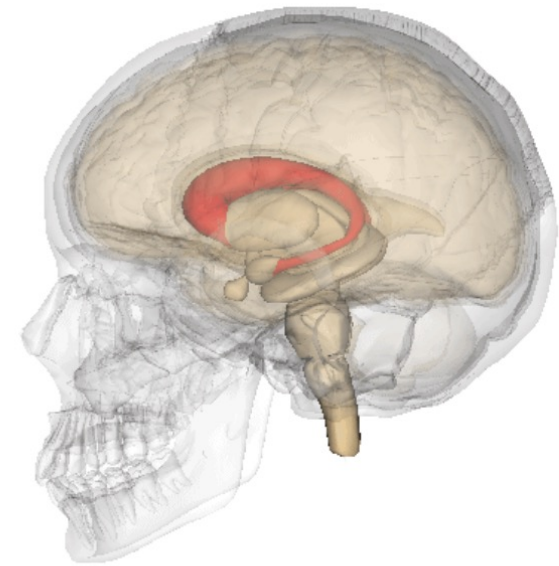
- a cortex is not necessary to
 - be conscious,
 - have feelings,
 - act with intentions,
 - perceive and appraise the environment,
 - engage socially and purposefully,
 - learn
- *c.f.* surgically decerebrate cats and rats (Wood, 1964)

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Low, P. (2012). The Cambridge Declaration on Consciousness. J. Panksepp, D. Reiss, D. Edelman, B. Van Swinderen, P. Low & C. Koch (Eds.), *Francis Crick Memorial Conference on Consciousness in Human and non-Human Animals*. Churchill College, Cambridge.

Making Sense of the World – Brainstem-Mediated Primary Consciousness

- A pre-reflective, pre-conceptual conscious experience
- Prospective, anticipatory awareness.
- Affective, evaluative.
- Brainstem mediated.
- ‘Phenomenal-Consciousness’, not yet ‘Access-Consciousness’ (Block, 1995)
- Direct neural access to
 - Exteroception,
 - Interoception,
 - Proprioception.
- Hypothesis: Autism is a disturbance to Primary Consciousness



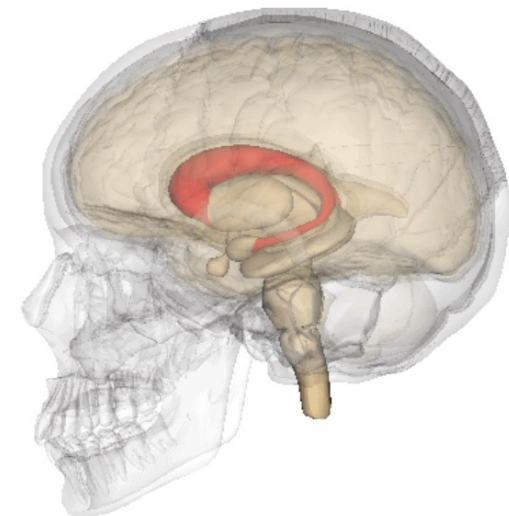
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Panksepp, J., & Biven, L. (2012). *The Archaeology of Mind: Neuroevolutionary Origins of Human Emotions*. New York: Norton.

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Making Sense of the World – Limbic-Mediated Secondary Consciousness

- Learning mediated by basal ganglia
- Classical conditioning (e.g. FEAR basolateral and central amygdala)
- Instrumental and Operant Conditioning (SEEKING via Nucleus Accumbens)
- Behavioural and Emotional habits, or rituals of practice
- Preconceptual awareness, primary conscious access to sub-neocortical memories that inform agent choice.
- Hypothesis: Autistic disturbance to Primary Experience affects Secondary Memory Stores and Conditioning – and *vice versa*



Trevarthen, C., & Delafield-Butt, J. T. (2013). Autism as a developmental disorder in intentional movement and affective engagement. *Frontiers in Integrative Neuroscience*, 7, 49. doi:10.3389/fnint.2013.00049

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Making Sense of the World – Cortex-Mediated Tertiary Consciousness

- Tertiary affects and neo-cortical ‘awareness’ functions
- Cognitive and executive functions (abstract reflective thought, planning, and offline imagination)
- Emotional ruminations and regulations (medial frontal cortex)
- So-called ‘free will’
- ‘Intentions-to-Act’ (Searle)

- A Conceptually-backed, reflective consciousness.
- ‘Access Consciousness’ on top of ‘Phenomenal Consciousness’

- Hypothesis: Autistic disturbance to Primary and Secondary Consciousness affects Tertiary Awareness – and *vice versa*

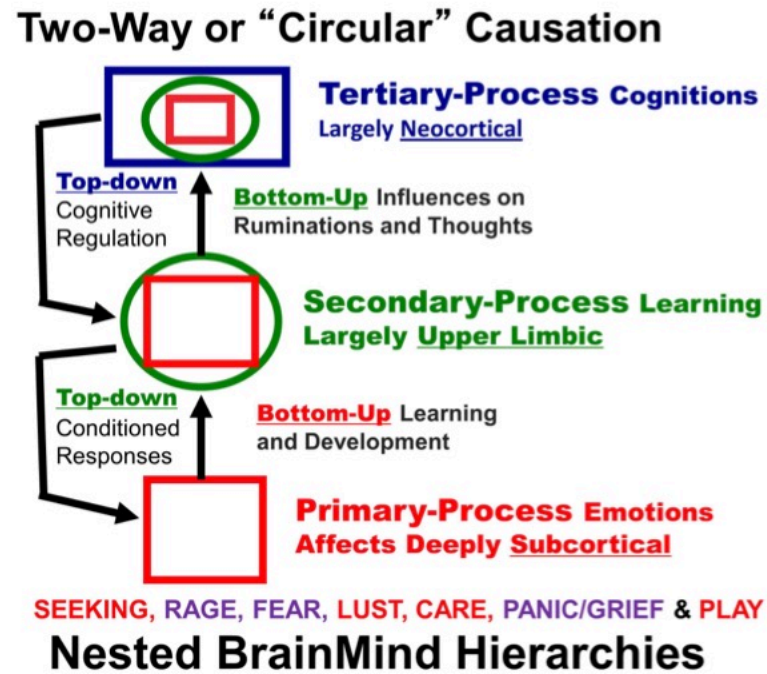


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Nested Mind-Brain Process

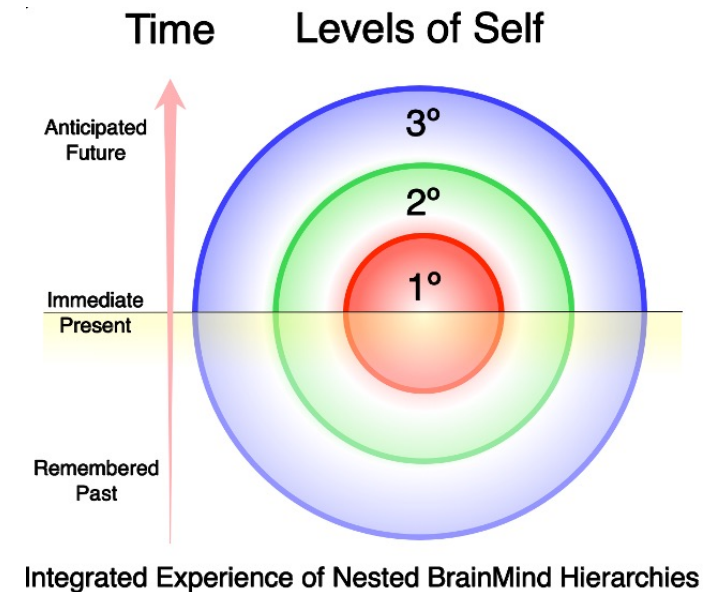
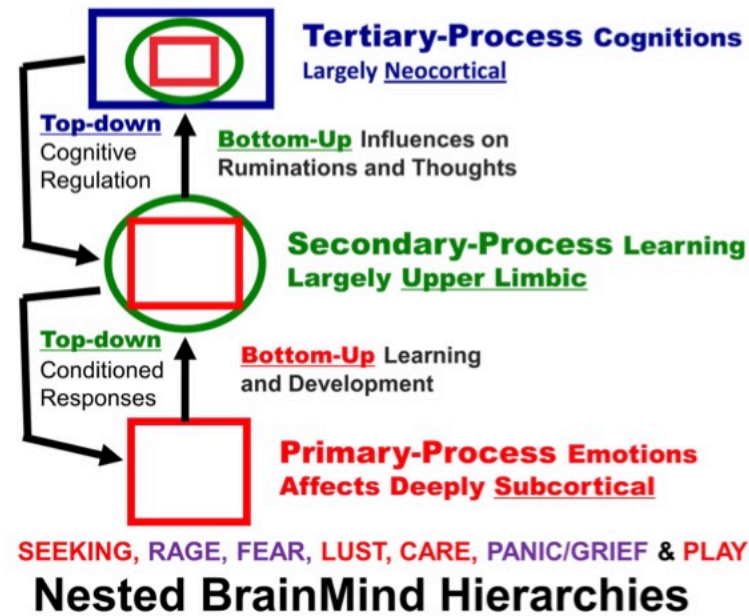


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Nested Mind-Brain Process

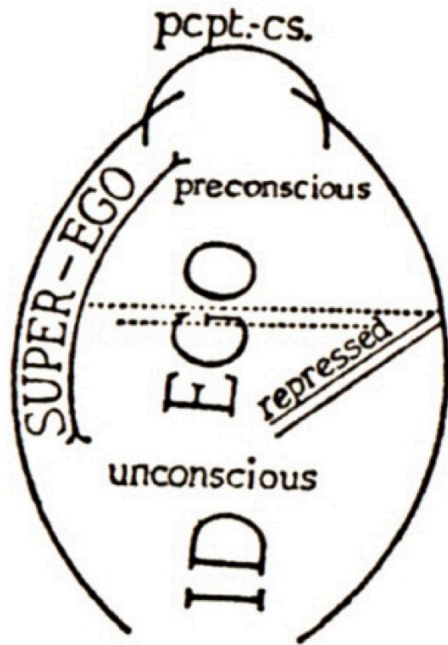
Two-Way or "Circular" Causation



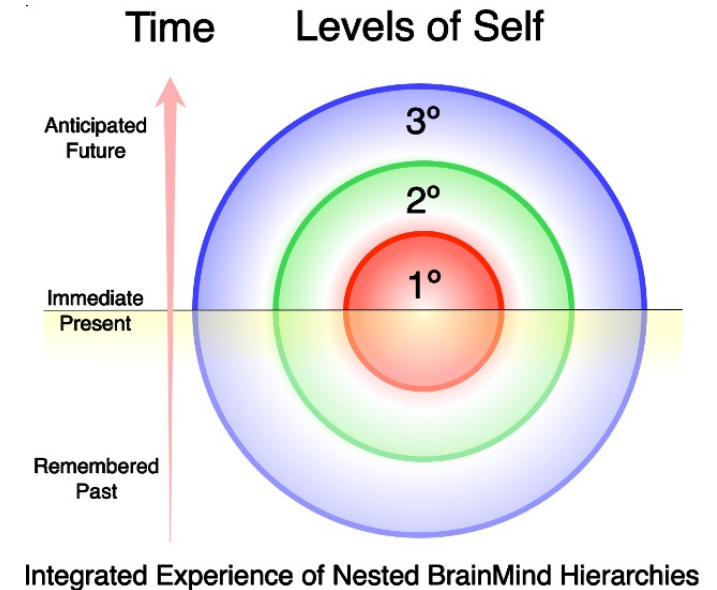
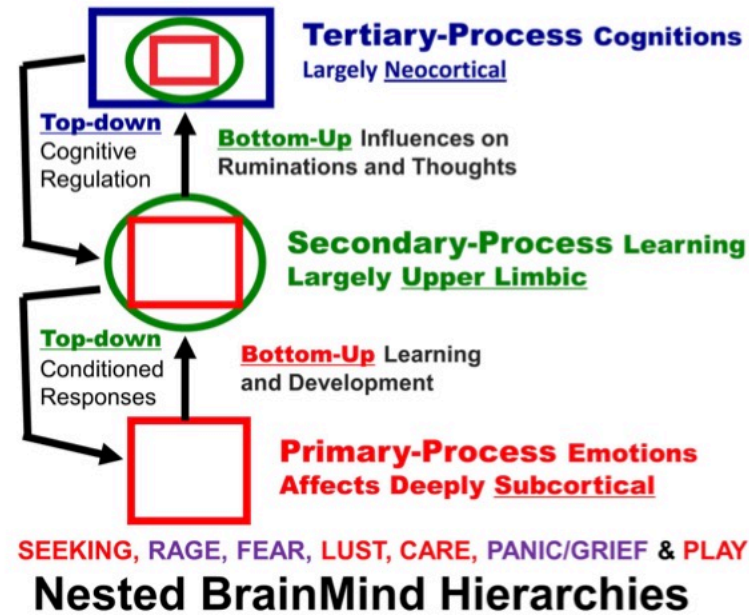
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Nested Mind-Brain Process



Two-Way or "Circular" Causation



Delafeld-Butt, J., Dunbar, P., & Trevarthen, C. (2022). Disruption to the Core Self in Autism, and Its Care. *Psychoanalytic Inquiry*, 42(1), 53-75. <https://doi.org/10.1080/07351690.2022.2007031>

Solms, M., & Panksepp, J. (2012). The "Id" Knows More than the "Ego" Admits: Neuropsychoanalytic and Primal Consciousness Perspectives on the Interface Between Affective and Cognitive Neuroscience. *Brain Science*, 2, 147-174.

Disruption to the Core Self in Autism, and Its Care

Jonathan Delafield-Butt, Ph.D. , Penelope Dunbar, M.Res., and Colwyn Trevarthen, Ph.D.

1. Swimming as creative therapy



Figure 3. Pum enjoying moving her body through the supportive medium of water, which offers routines of sensorimotor integration and progress in movement for psychological integration and health.

2. Collage as creative therapy



Figure 4. An original collage artwork by Pum that explores and expresses visually a growing understanding of the neurobiological basis of autism spectrum disorder. the fetus represents the core self, and the collage spatially positions images in correspondence to the brain locations of various structures to represent those functions (see box for description.).

Daniel Posner (ed.)

Psychoanalytic Inquiry, Volume 42.

February 2022

**The Interpersonal
World of the
Autistic Infant: An
Interdisciplinary View**

INTERNATIONAL
JOURNAL OF
PSYCHOANALYSIS

Action Organisation: A Nested Hierarchy of Sensorimotor Intentions

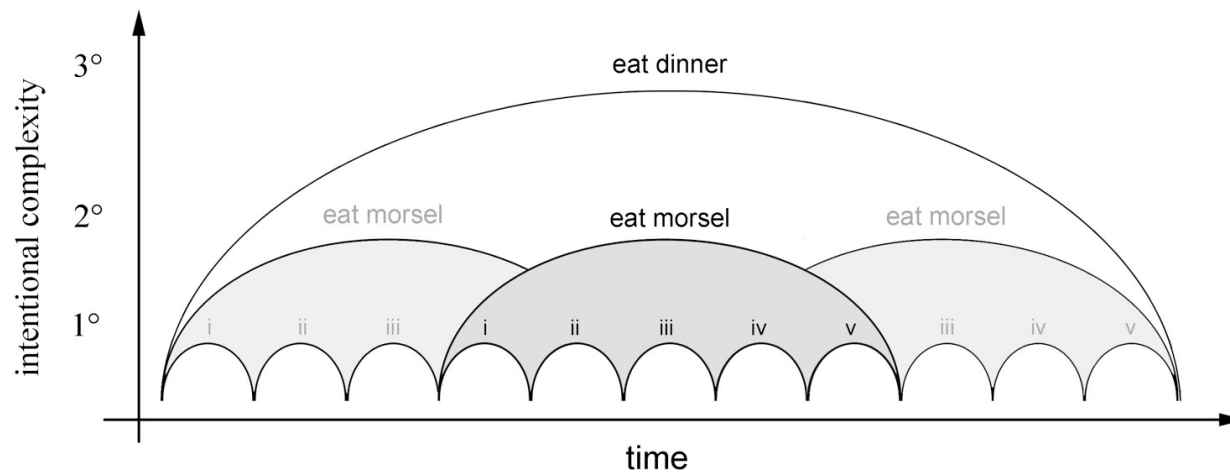


Table 1
Units of sensorimotor intentionality.

Level	Unit type	Description	Temporal range (ms)
Primary	Action unit	A single continuous velocity to a goal, for e.g. an arm movement to a body-space or physical object goal	ca. 200–1200
Secondary	Proximal project	Coordination and serial organisation of multiple action units for a proximal goal, for e.g. reach-to-grasp or reach-to-grasp-to-eat	ca. 1000–3000
Tertiary	Distal project	Coordination and serial organisation of proximal projects to achieve a higher, abstract, distal goal, for e.g. cooking a dinner	>3000



Delafeld-Butt, J. (2018). The Emotional and Embodied Nature of Human Understanding. In C. Trevarthen, J. Delafeld-Butt, & A.-W. Dunlop (Eds.), *The Child's Curriculum*. Oxford: Oxford University Press.



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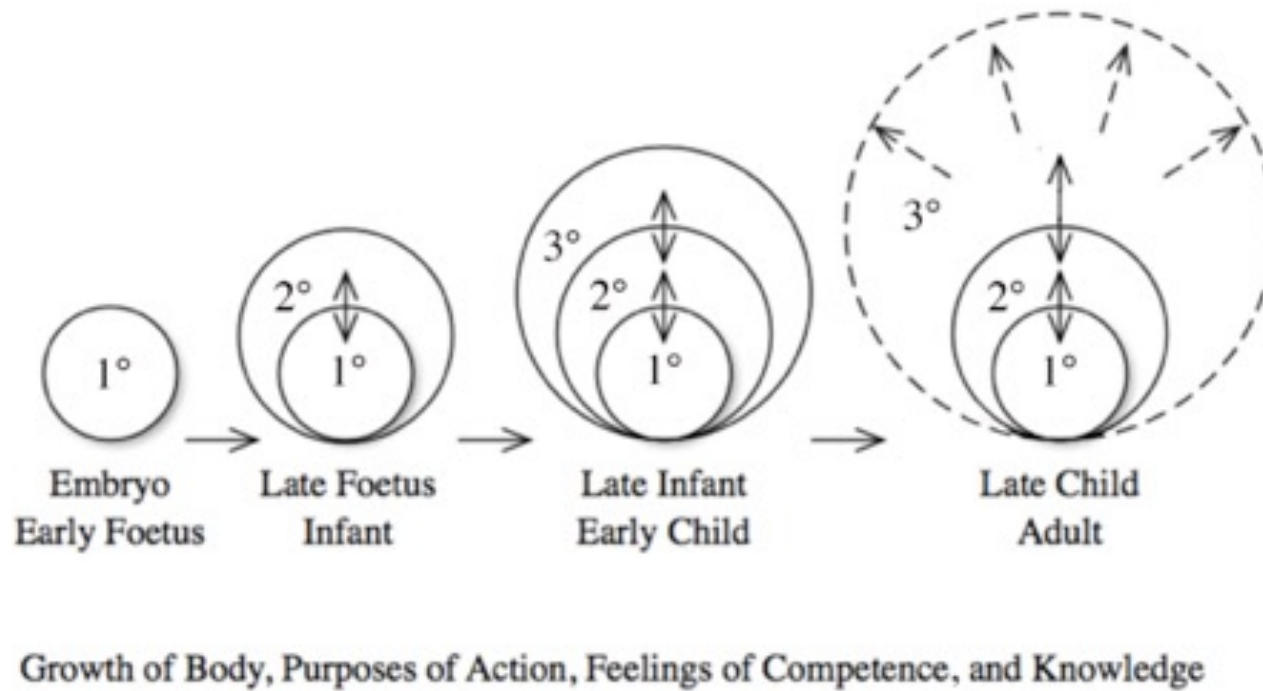
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Sensorimotor Satisfaction:
Joy in Successful Secondary Sensorimotor Intentionality

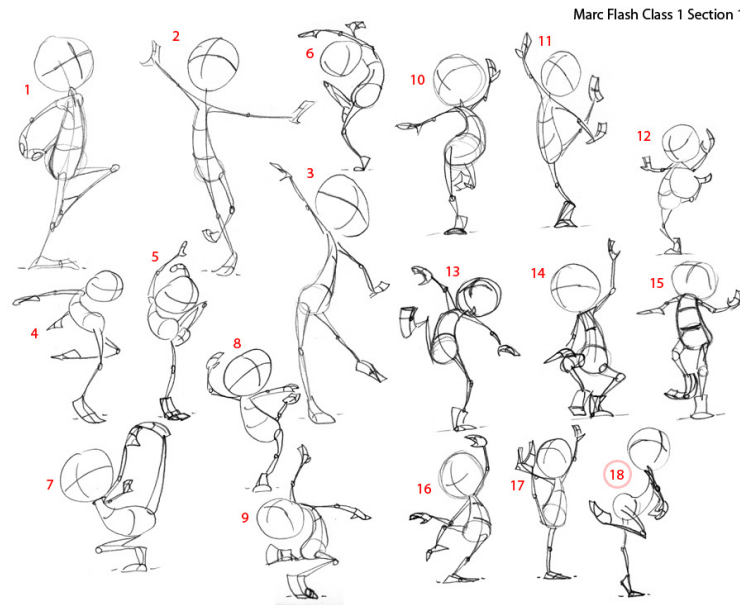


Development of Human Consciousness in step with motor development

Experience of Life in the World and Society



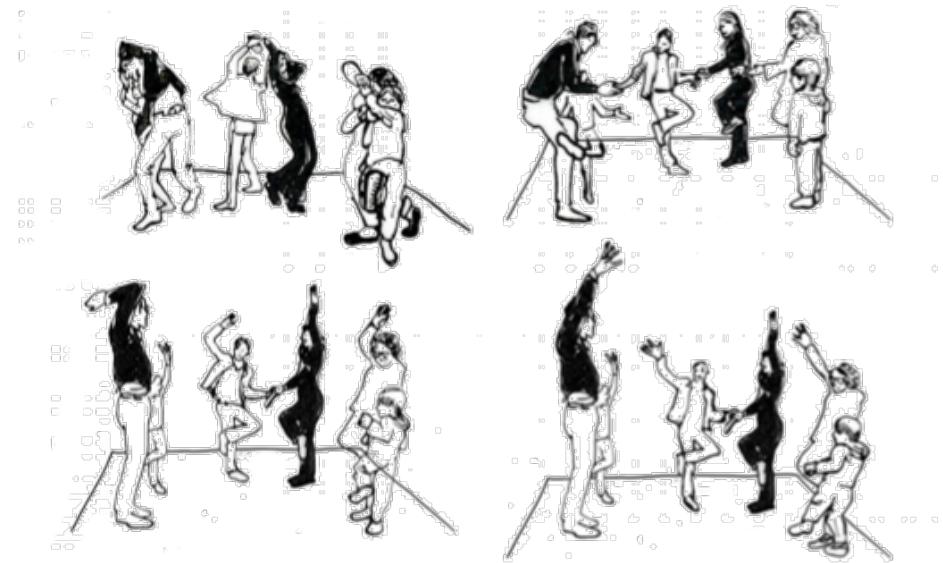
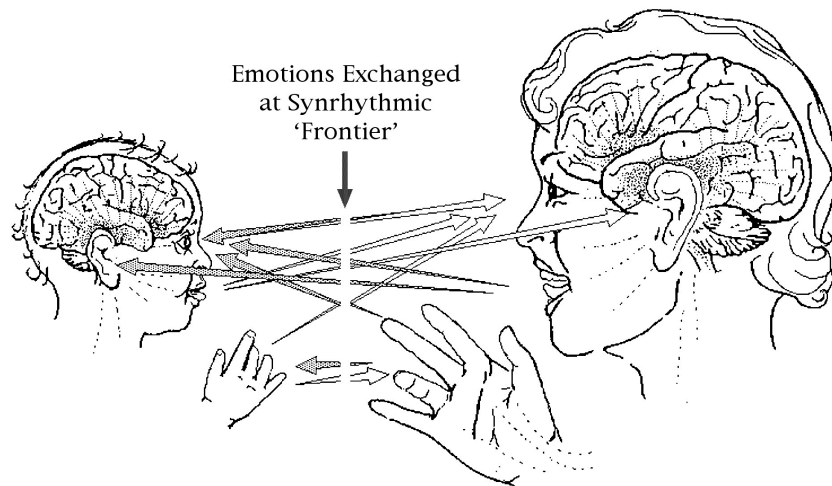
Principle 1: I like to move it.



inherent satisfaction or joy in successful solo
sensorimotor acts

(moving, grasping, walking, skiing, climbing, tight-rope walking)

Principle 2: I like to move it with you.

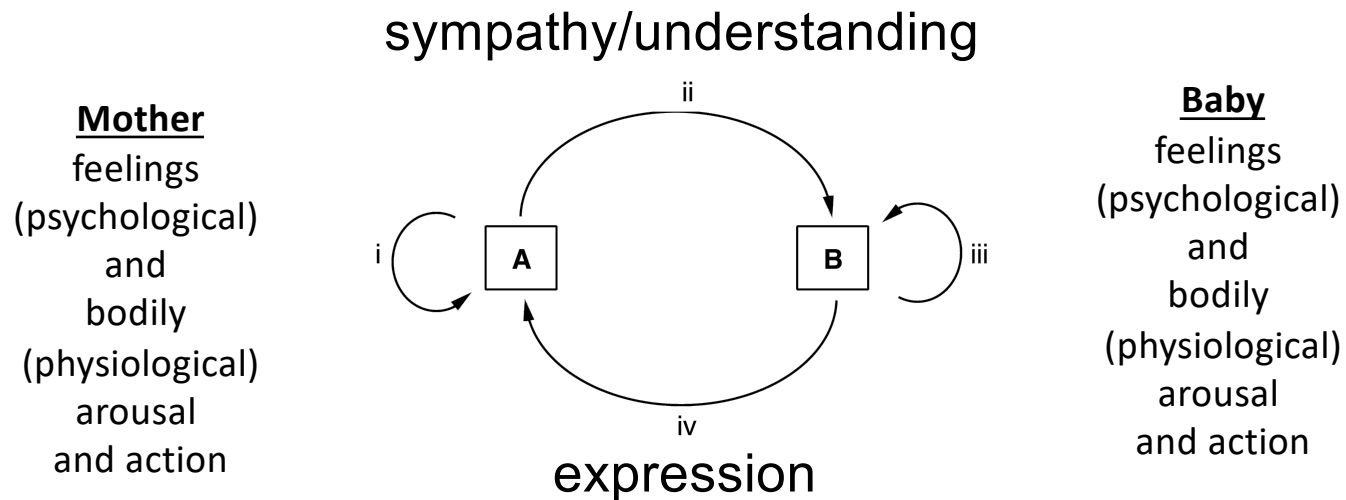


requires two sensorimotor systems with two timing systems to be **in step and in tune** with each other to generate shared meaning and joy.

Left panel: Trevarthen, C., Aitken, K. J., Nagy, E., Delafield-Butt, J. T., & Vandekerckhove, M. (2006). Collaborative Regulations of Vitality in Early Childhood. In D. Cicchetti & D. J. Cohen (Eds.), *Developmental Psychopathology* (pp. 65-126). New York: John Wiley & Sons

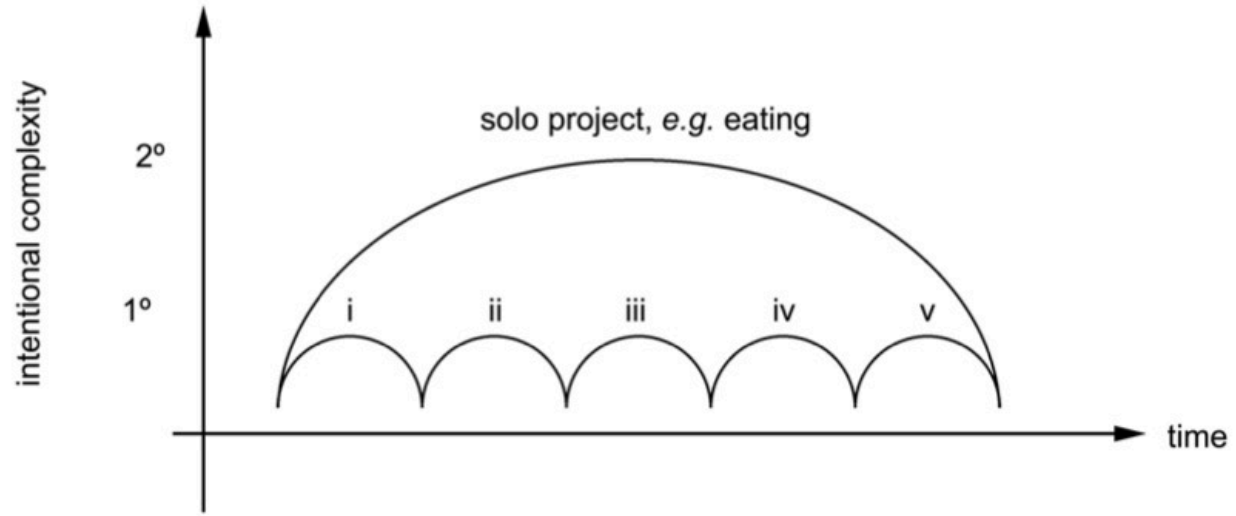
Right panel: Avila, Daniel (2016). A musicalidade comunicativa das canções. DPsych Thesis, Universidade de São Paulo, Brazil

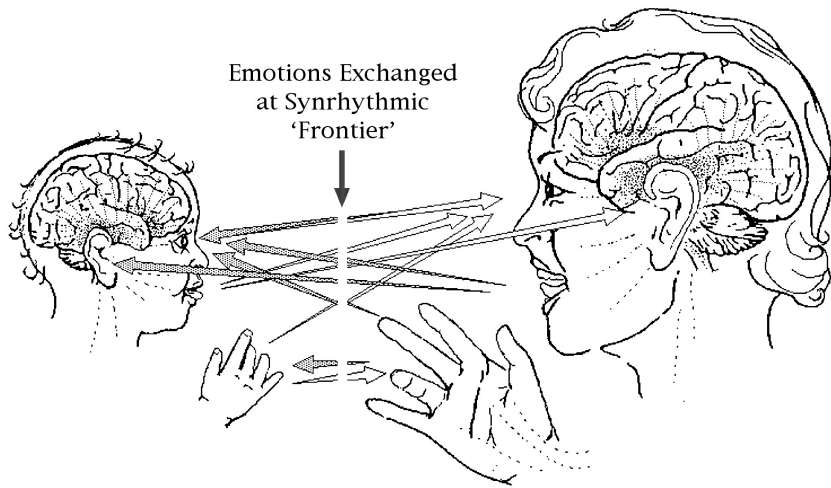
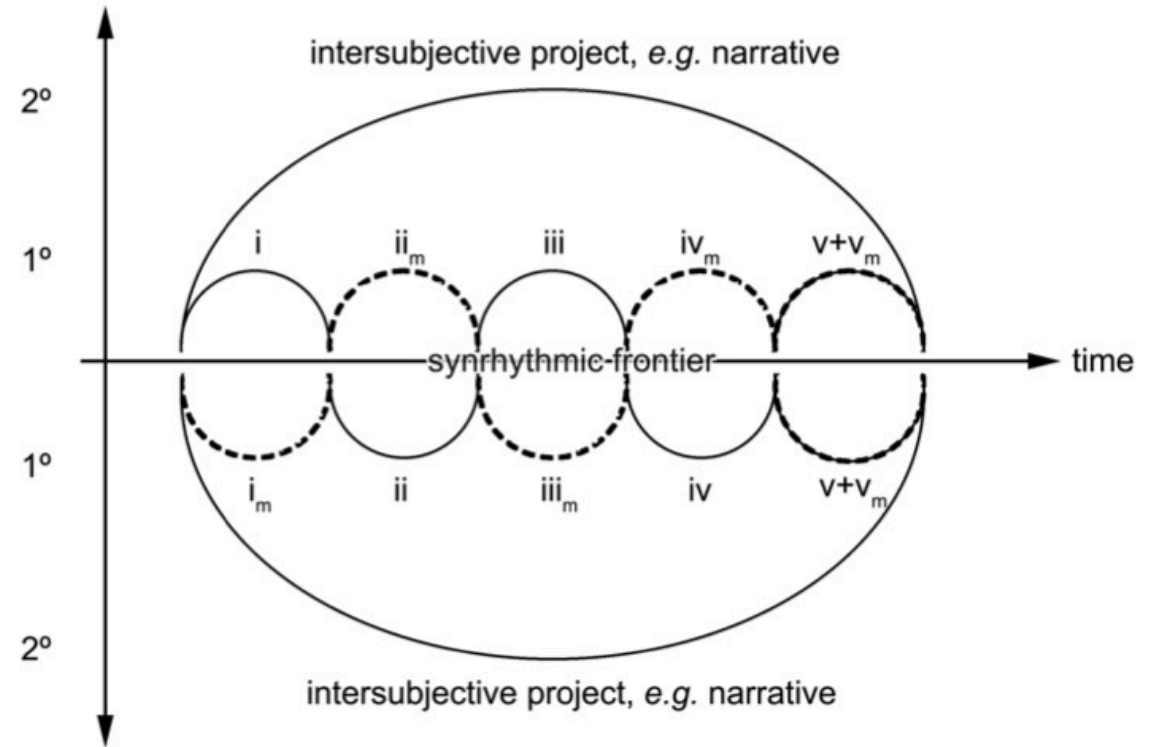
Co-operation after birth to share meaning



These events are made in cycles and when completed successfully, satisfaction and joy emerge.

a



a**b**

Baby B & His Mother in the Neonatal Unit (born at 28 wks, now at 36 wks GA)



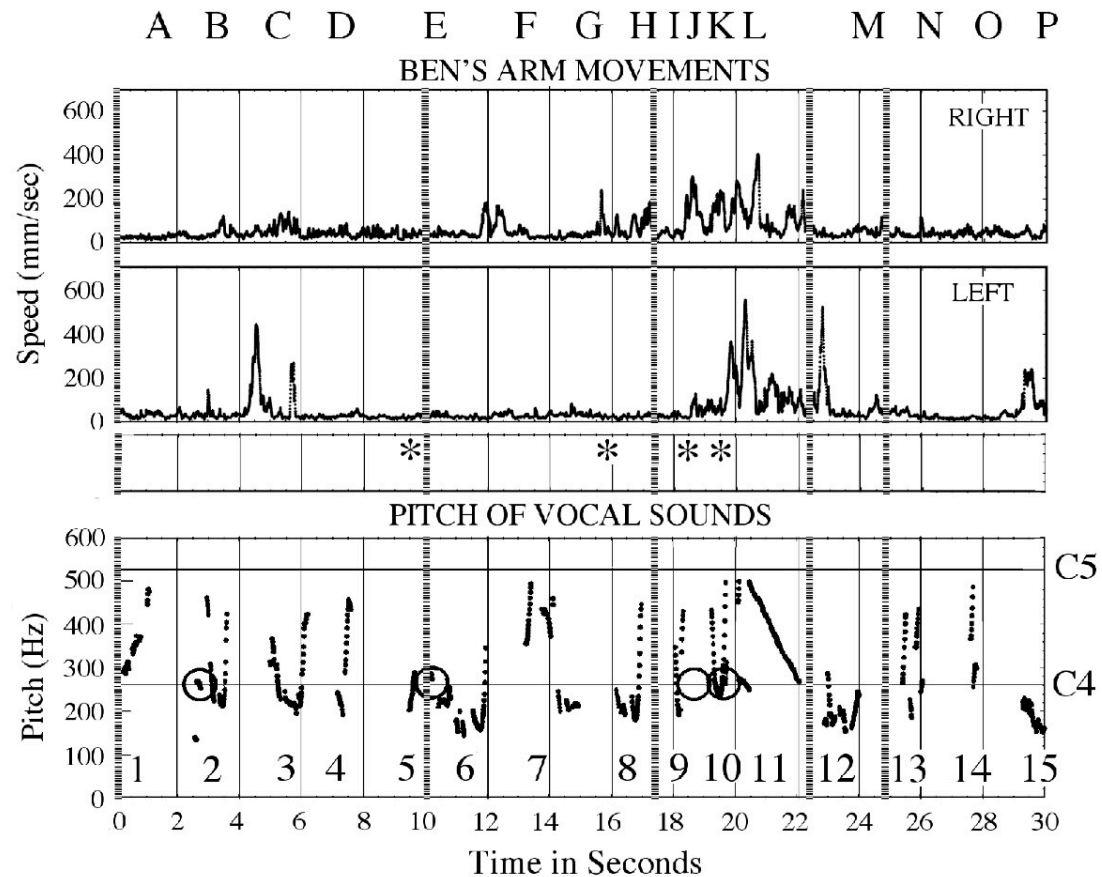
INTRODUCTION

DEVELOPMENT

CLIMAX

RESOLUTION





INTRODUCTION [ATTENTIVE]

- 1 - Are you woken up, mister?
- 2 - Good afternoon!
- 3 - Good afternoon, wee E
- 4 - How are you doin'?
- 5 - Eh?

DEVELOPMENT [RESPONSIVE]

- 6 - Oorh, look at that big smile!
- 7 - [Oh ... That's all great]
- 8 - Look at that big smile

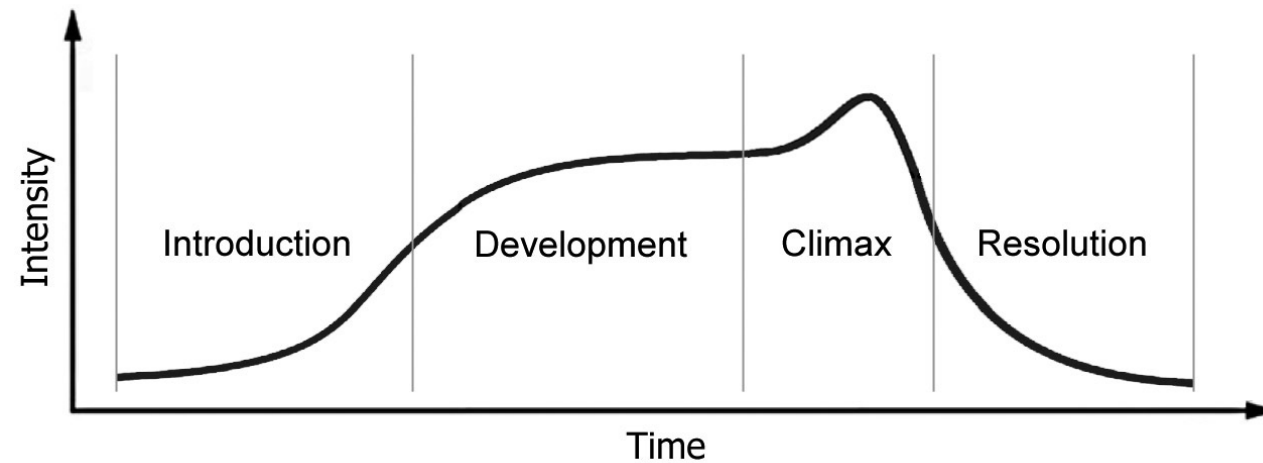
CLIMAX [LIVELY/
ENGAGED]

- 9 - Hi Ya!
- 10 - Hello there!
- 11 - *Kiss and Glide*

RESOLUTION [REFLECTIVE/
RELAXED]

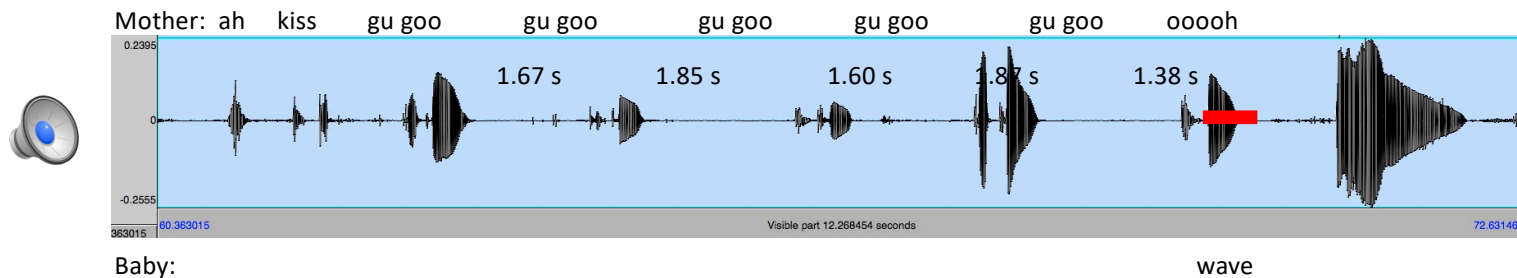
- 12 - Oh, you're kicking your Mum
- 13 - Are you kicken me?
- 14 - Eh?
- 15 - Have a big wriggle, then

Narrative Cycle





Multimodal Infant-Parent Narratives



Characters of a Narrative Sequence

- (i) opening; ah, kiss, & engagement
- (ii) build; regular Regular 1.6/1.8 s bars and regular durations *ca.* 0.5 s
- (iii) climax; baby joins in on beat with arm wiggle and coo
- (iv) close; baby coo and mother coo w/ final lengthening

Embodied Narrative in Learning: Descending the Stairs, and Counting

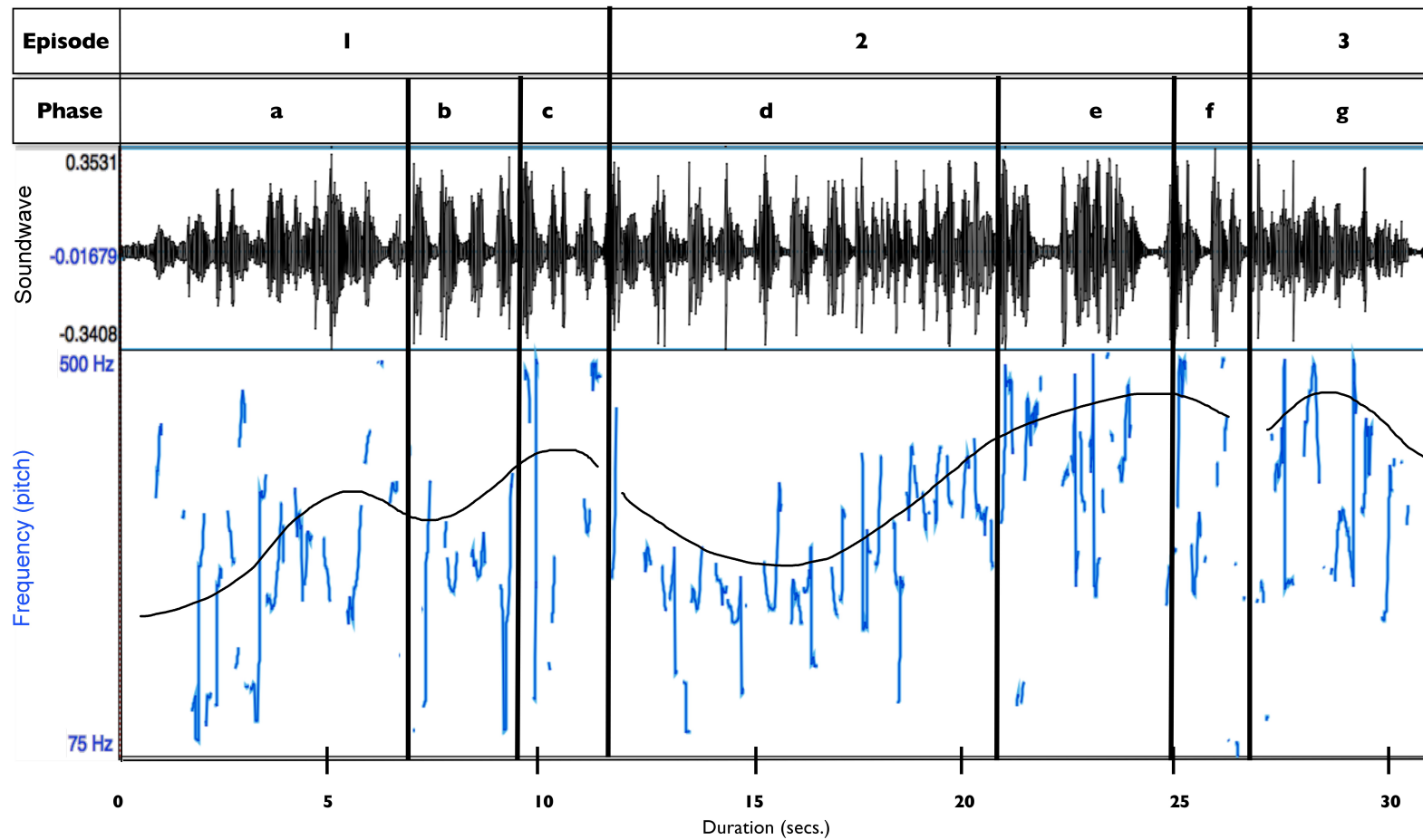
The case of a Nurture Group teacher and her student descend the stairs.

- **Introduction** as the teacher explains the task ahead.
- **Development** as they descend the stairs, their footsteps falling into rhythm as they count the stairs together.
- A **climax** marked by excitement in vocal pitch as they reach end, quickly
- **concluding** as they depart.

Embodied Narrative in Learning: Descending the Stairs, and Counting

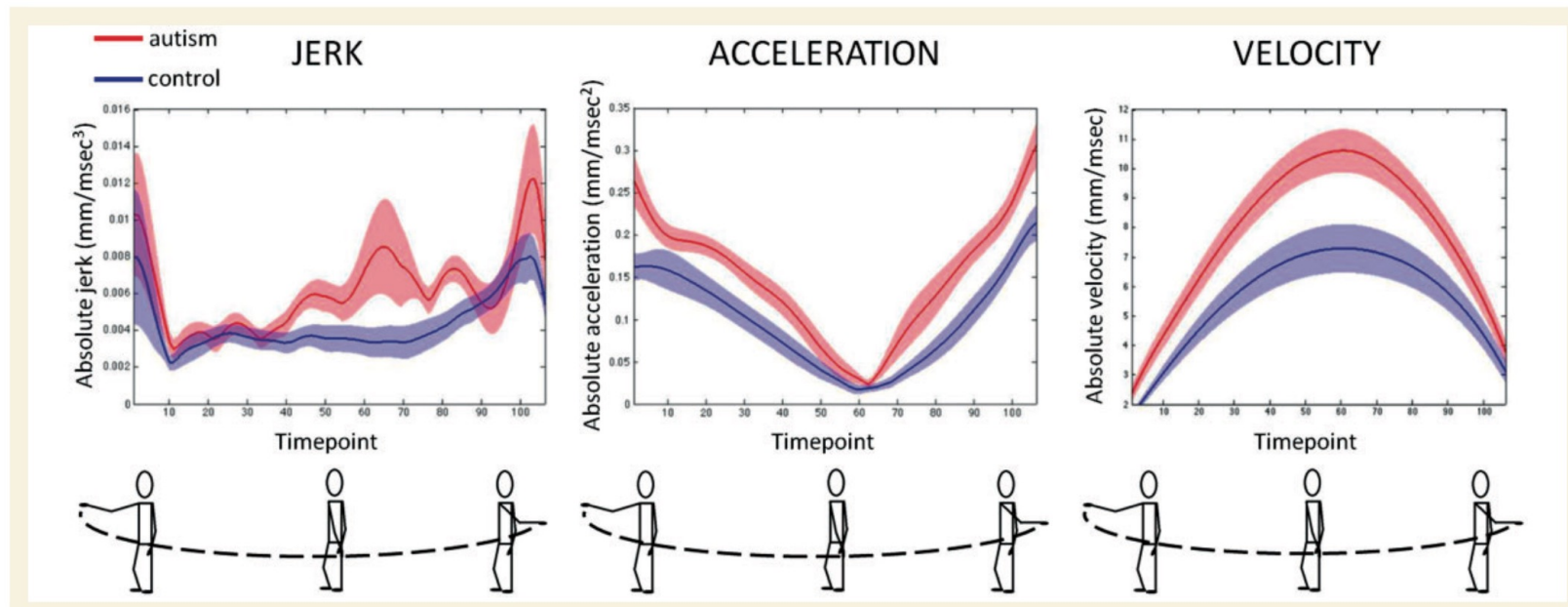


Delafield-Butt, J., & Adie, J. (2016). The Embodied Narrative Nature of Learning: Nurture in school. *Mind Brain & Education*, 10(2), 14. doi:10.1111/mbe.12120

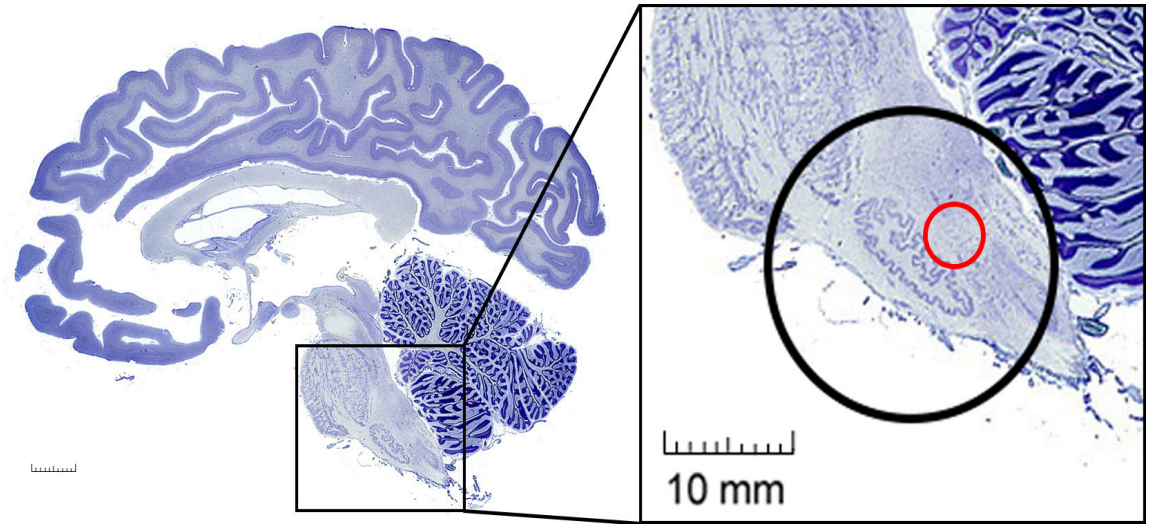
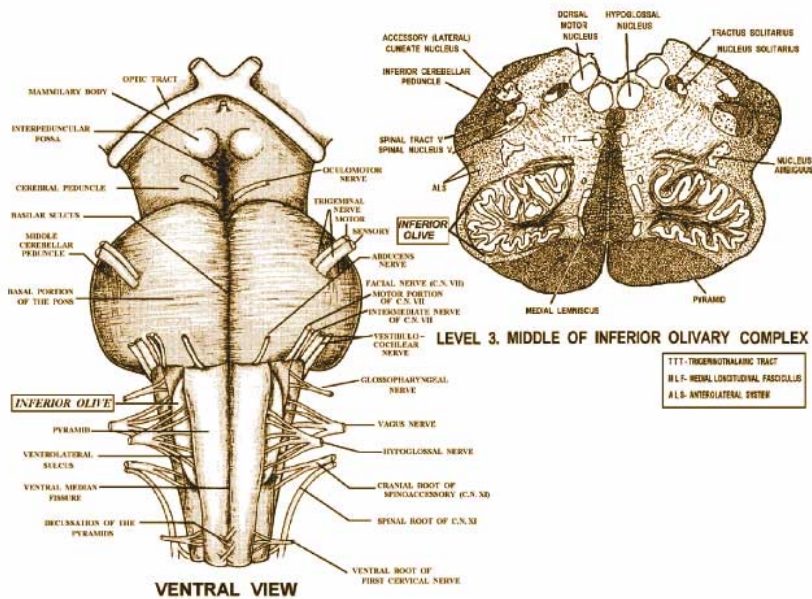


Delafeld-Butt, J., & Adie, J. (2016). The Embodied Narrative Nature of Learning: Nurture in school. *Mind Brain & Education*, 10(2), 14. doi:10.1111/mbe.12120

Atypical basic movement kinematics



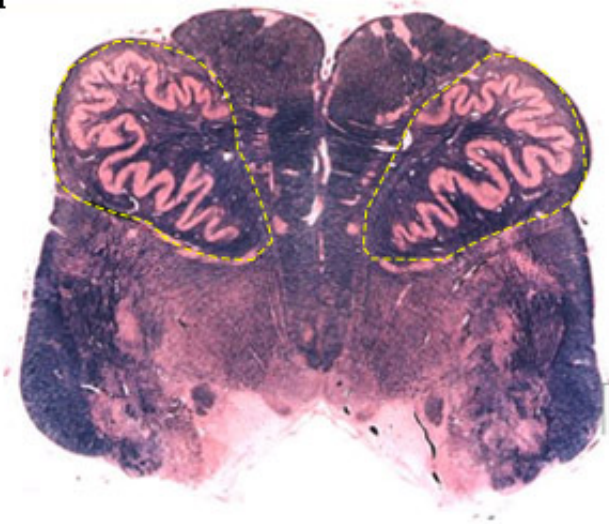
Neural Growth Error in Brainstem Sensorimotor Timing & Integration Nuclei in Autism



Delafeld-Butt, J., & Trevarthen, C. (2017). On the Brainstem Origin of Autism: Disruption to Movements of the Primary Self. In E. Torres & C. Whyatt (Eds.), *The Movement Approach to Autism*: Taylor & Francis.

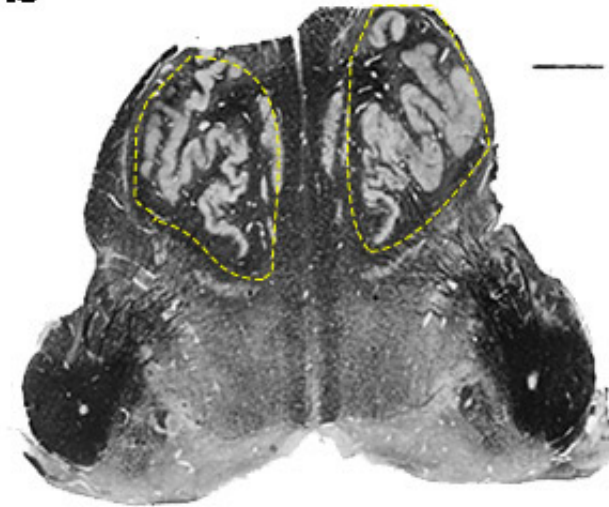
Inferior Olive Motor Pacemaker in Autism

a



Control

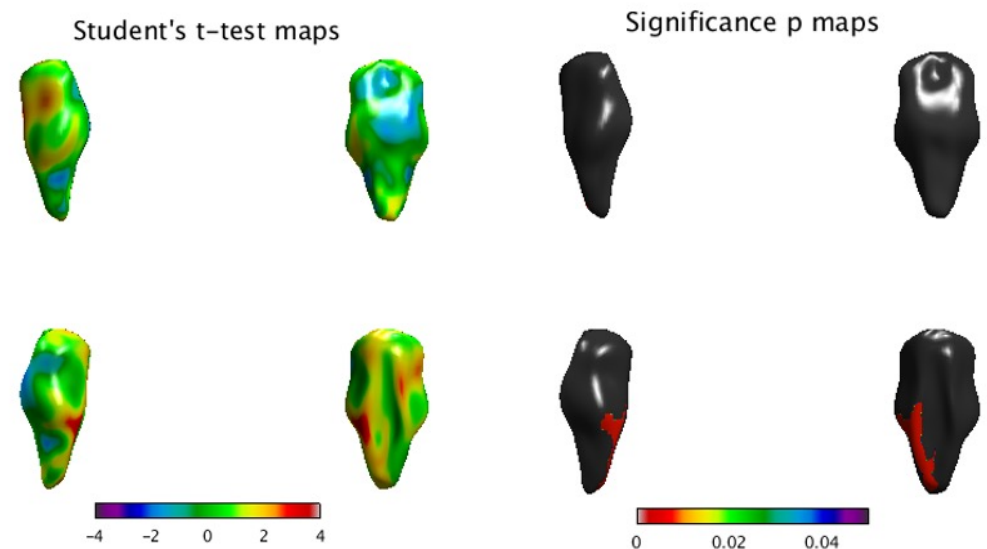
b



Autism

Brainstem enlargement in preschool children with autism

- 76 preschool children with ASD
- 76 preschool children TD
- ASD brainstem volume greater
- ASD brainstem shape is different
- Increased significance in Males and Low IQ (ID) children



Tablet and phone games could help diagnose autism, study suggests

30 August 2016

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Autism could be diagnosed by allowing children to play games on smart phones and tablets, according to a study.

SCIENTIFIC REPORTS

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Toward the Autism Motor Signature: Gesture patterns during smart tablet gameplay identify children with autism

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Anna Anzulewicz^{1,2}, Krzysztof Sobota² & Jonathan T. Delafield-Butt³

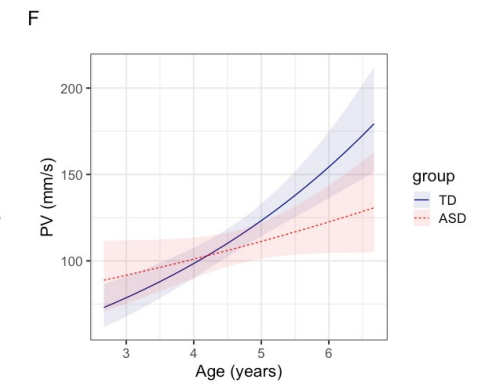
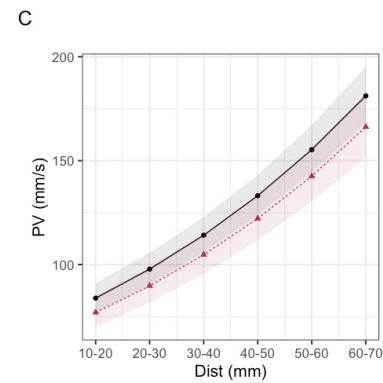
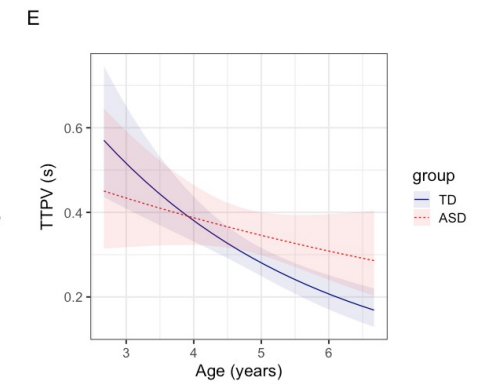
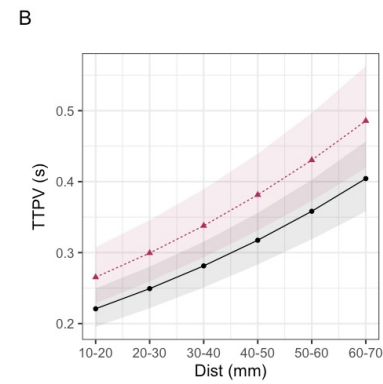
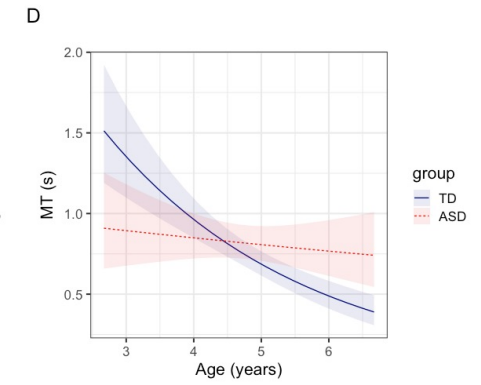
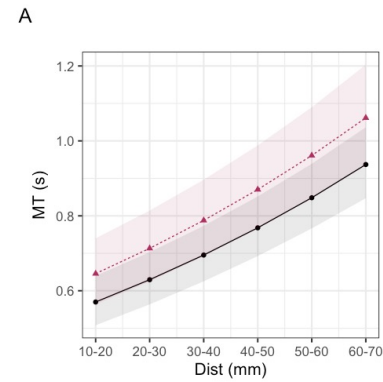
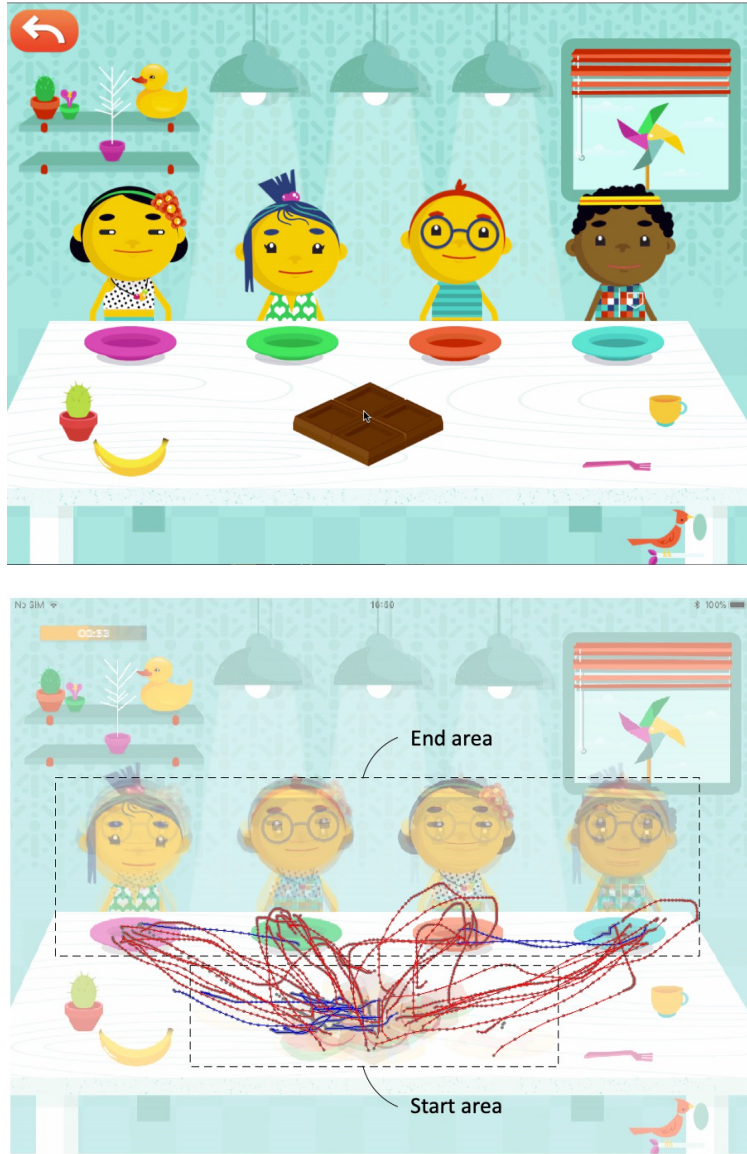
Open access

Protocol

BMJ Open Phase 3 diagnostic evaluation of a smart tablet serious game to identify autism in 760 children 3–5 years old in Sweden and the United Kingdom

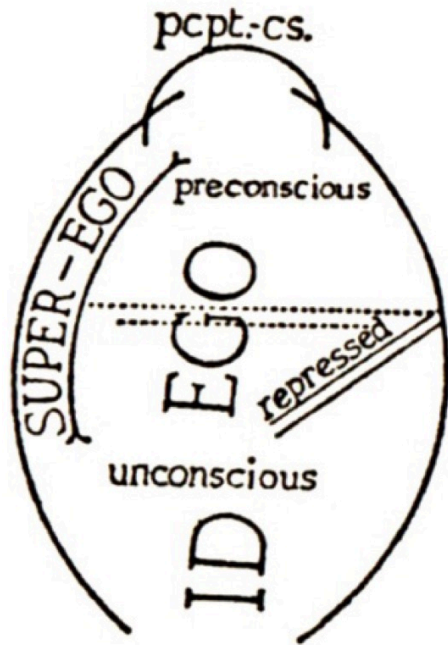
Lindsay Millar,^{1,2} Alex McConnachie,³ Helen Minnis,⁴ Philip Wilson,⁵ Lucy Thompson,^{5,6} Anna Anzulewicz,⁷ Krzysztof Sobota,⁷ Philip Rowe,^{1,2} Christopher Gillberg,^{4,6} Jonathan Delafield-Butt¹



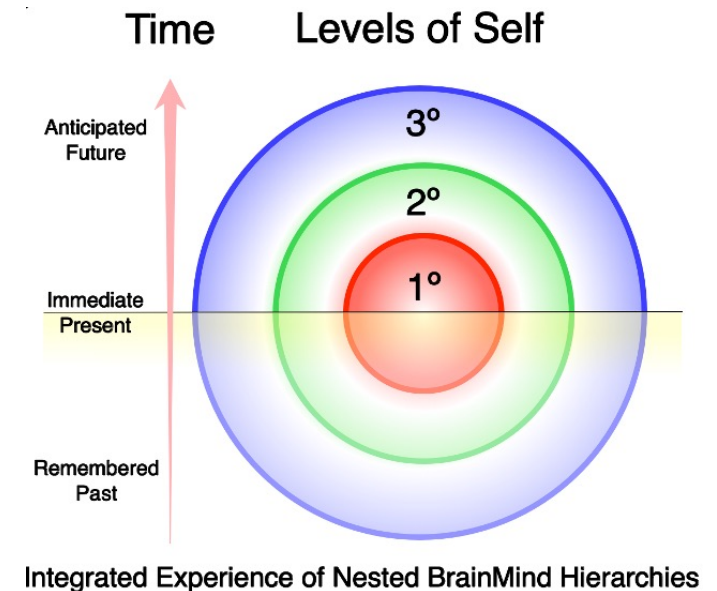
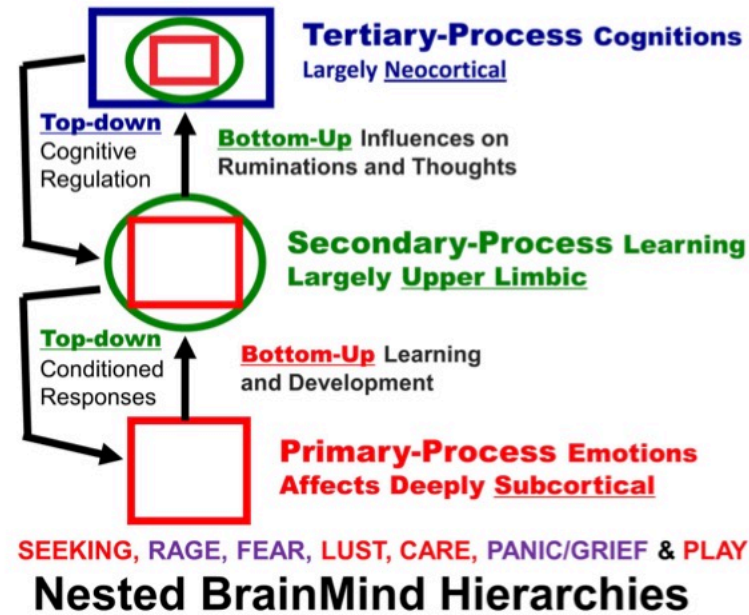


Chua, Y. W., Lu, S.-C., Anzulewicz, A., Sobota, K., Tachtatzis, C., Andonovic, I., Rowe, P., & Delafield-Butt, J. (2022). *Developmental Science*, e13195.

Disruption to the Core Self in Autism, and its Nested Mind-Brain Processes



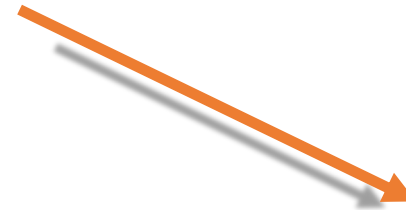
Two-Way or "Circular" Causation



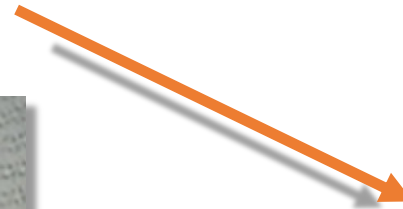
Narrative is Invariant



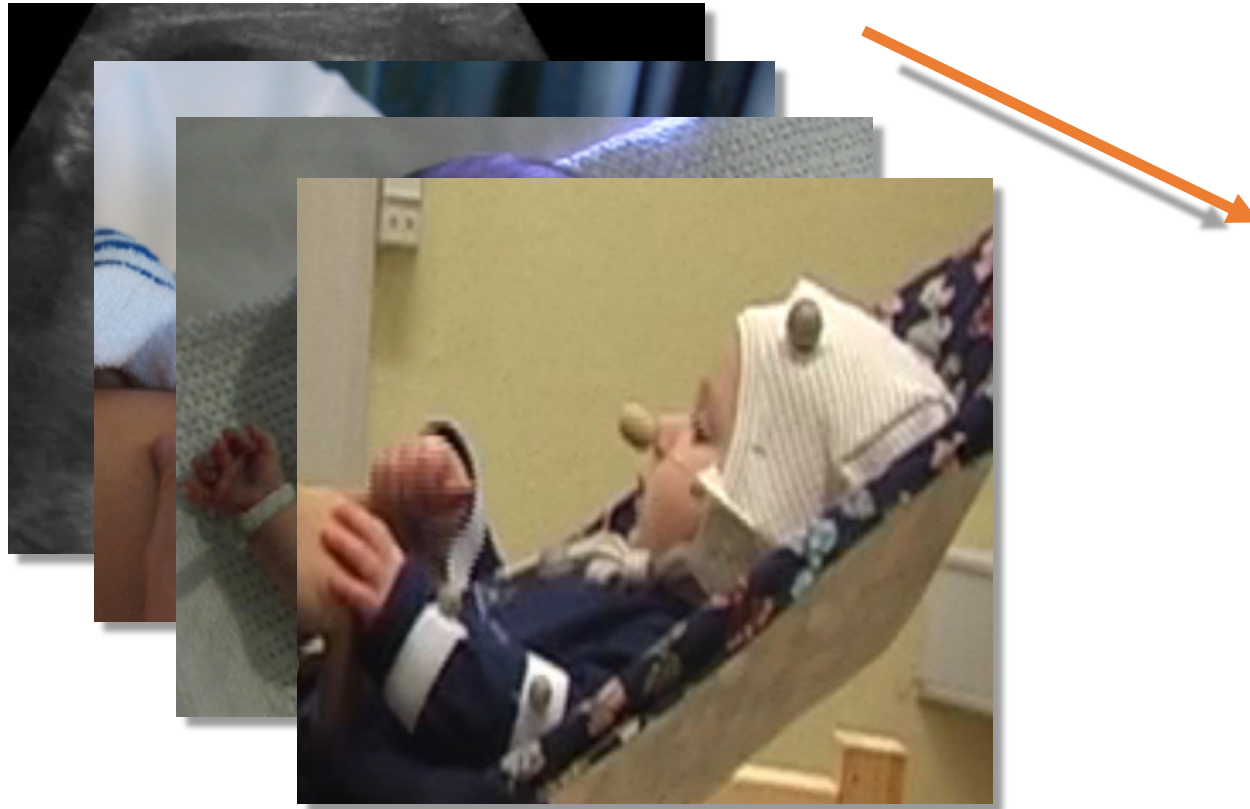
Narrative is Invariant



Narrative is Invariant



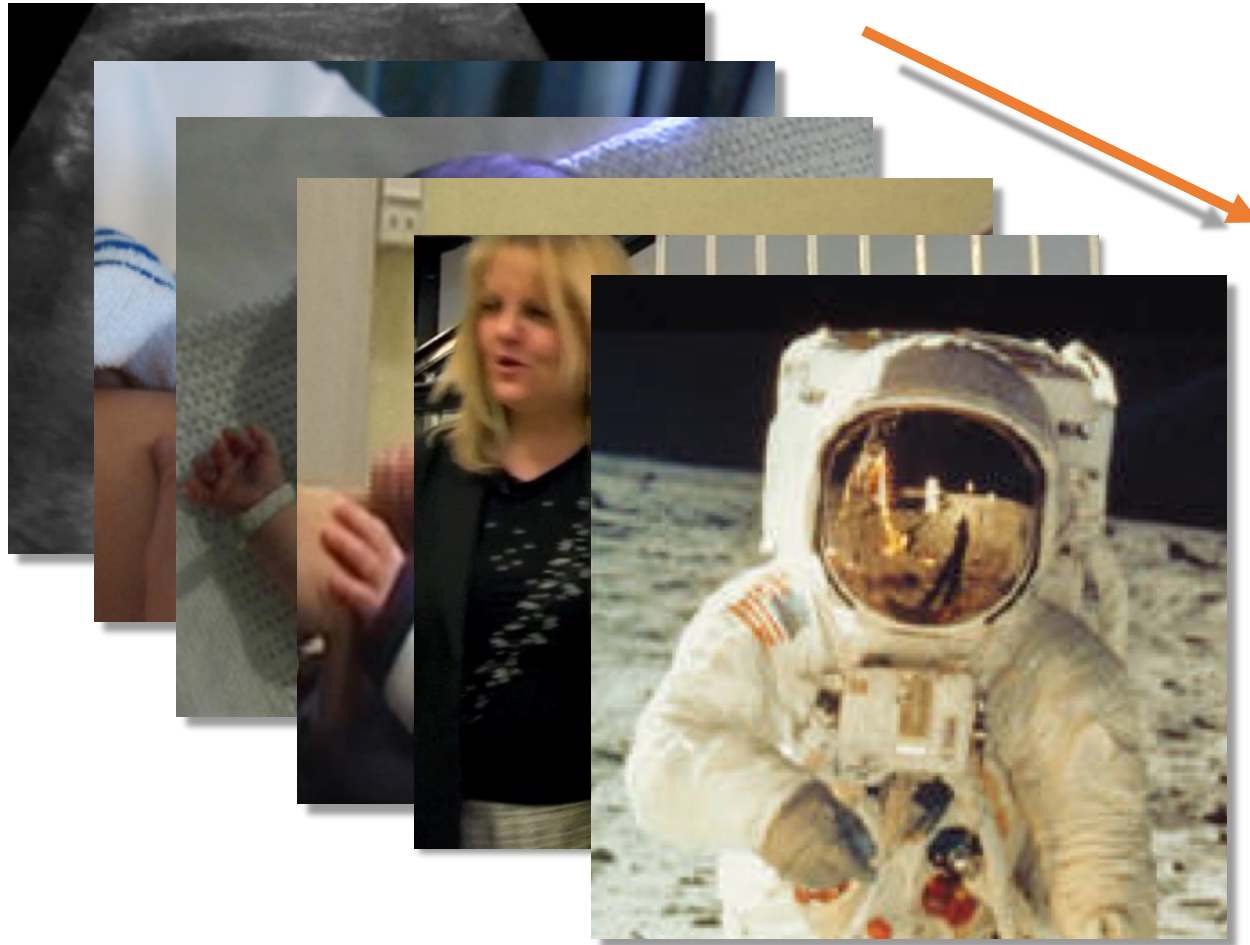
Narrative is Invariant



Narrative is Invariant



Narrative is Invariant





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Prof Dave Lee FRSE

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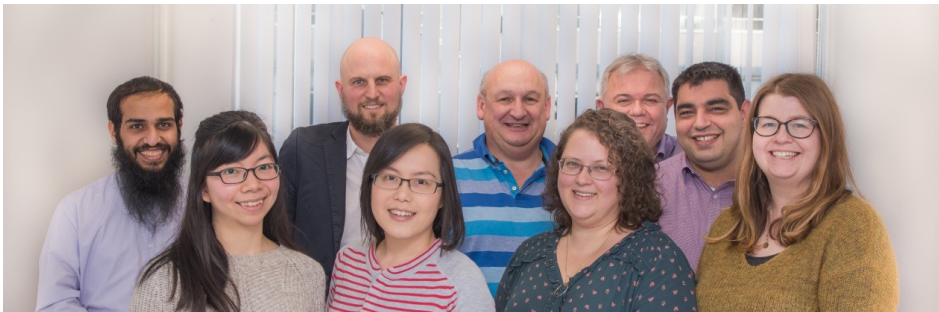
Adam Mitchell
Timothy McGowen
Yu Wei Chua
Stella Gkegka
Daniel Jiminez
Ismail Okatan
Rachel Shannon

Funders

Hawthorne



CAPITA



Thank you

Jonathan Delafield-Butt

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