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Y Drindod Dewi Sant
University of Wales
Trinity Saint David

Trawsnewid Addysg; Trawsnewid Bywydau
Transforming Education; Transforming Lives

Physical Literacy and Motor development in Foundation Learning

Dr Nalda Wainwright, Associate Professor
Director: Wales Academy for Health and Physical Literacy

Presentation overview

- Physical literacy
- The importance of movement in early childhood.
- Researching the Foundation Phase
- Development of SKIP-Cymru
- Physical literacy and the outdoors
- Affordance theory



© Grounds for Learning & Malcolm Cochrane
Trinity Saint David



1st award class

Sicrwydd Ansawdd y DU





Physical Literacy

Physical literacy can be described as the motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engagement in physical activities for life.

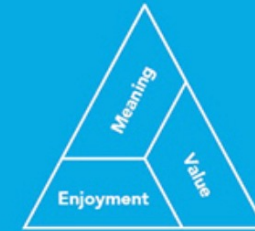
Whitehead, M. 2016.

Sport England consensus statement

**Physical literacy
is our relationship
with movement
and physical activity
throughout life.**

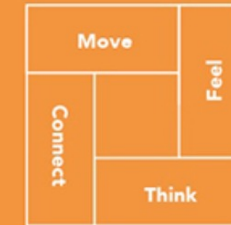
A personal relationship

Having a positive and meaningful association with movement and physical activity.



Movement and physical activity

How we move (physical), connect (social), think (cognitive) and feel (affective) during movement and physical activity plays a crucial role.



Throughout life

Influenced across the lifecourse by individual, social and environmental factors.



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Physical literacy Sport Wales



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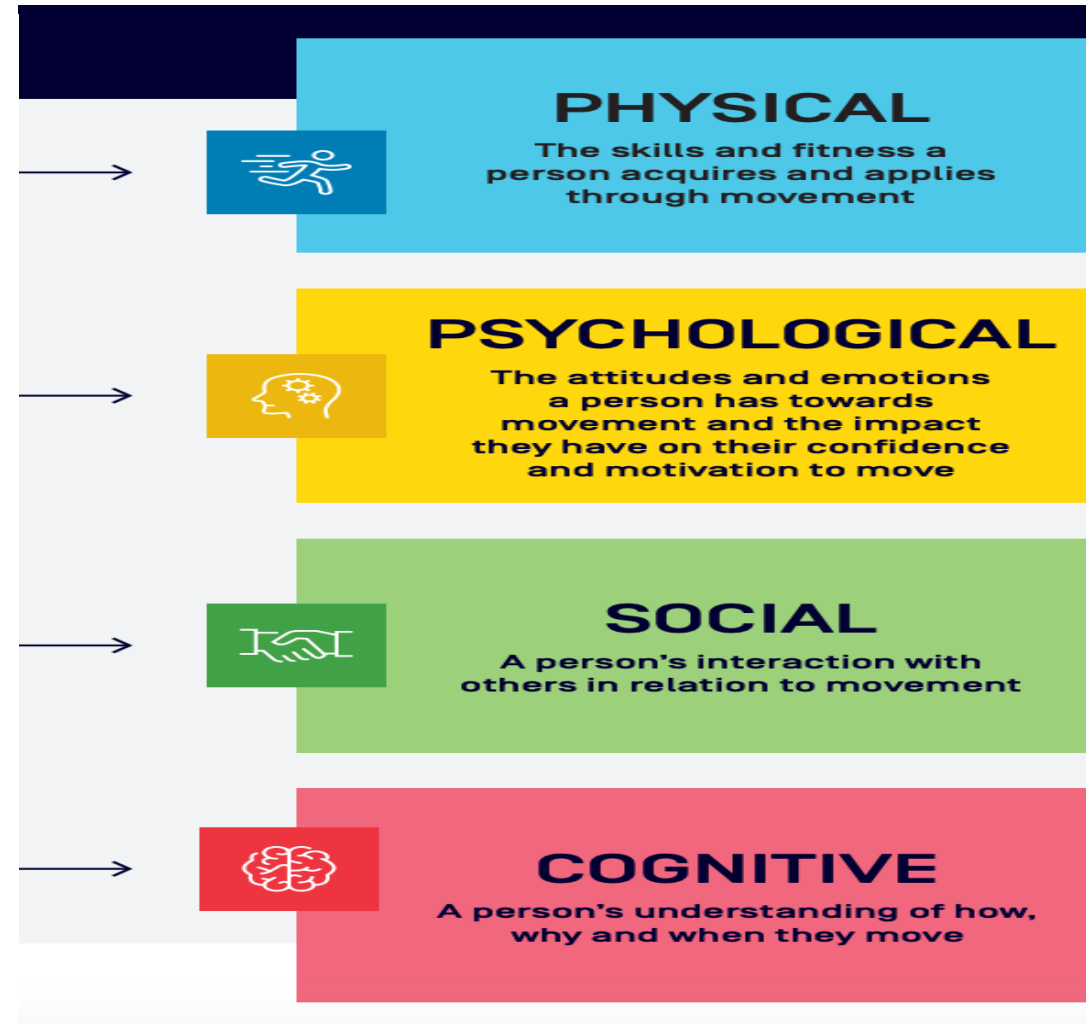


Task: Your own journey...

- Draw your own pathway
- Think about your own experiences as you've been growing up
- What games did you play?
- Who was involved in your journey?



Sport Australia – PL consensus





Philosophical perspective...

- Drawing on existentialism, Whitehead highlights how it is through physical '*embodiment*' that humans '*create themselves as they interact with their surroundings*' (Whitehead, 2010:26).





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Why does physical literacy matter?



It is challenges the dualist objectification of the body



Understanding Physical Literacy supports physical activity

- Starts in the early years-developmental process
- Provide supports across all phases of lifespan



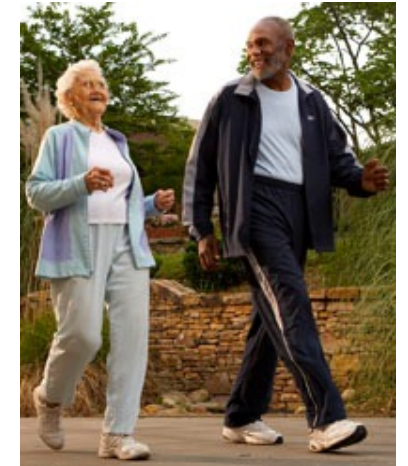
Preschool years

Primary School



Secondary School

Adult & Working



Older Adult

Developmental Process

Remember the Physical Literacy perspective...

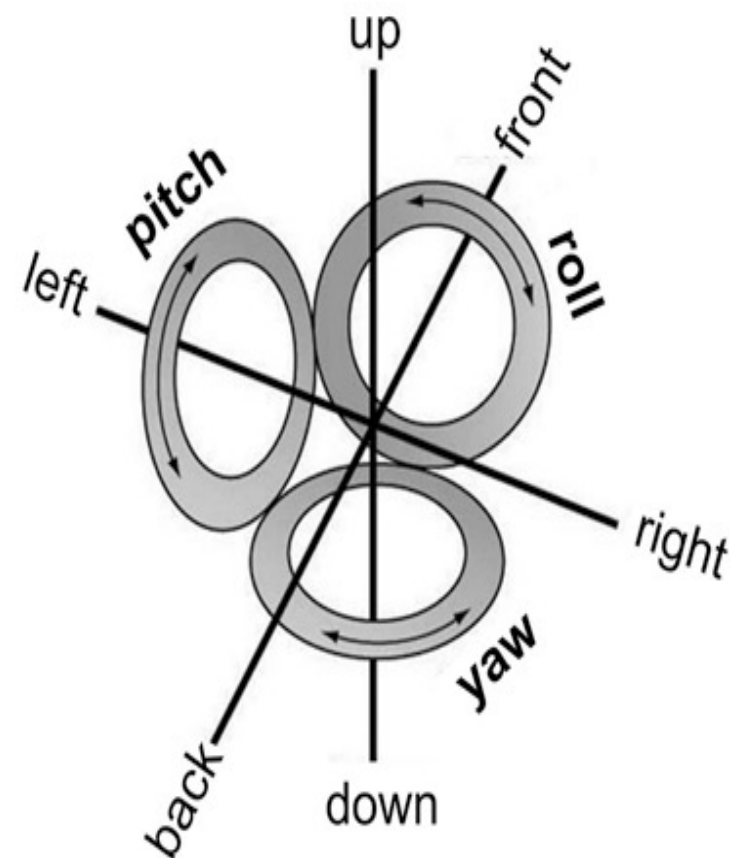
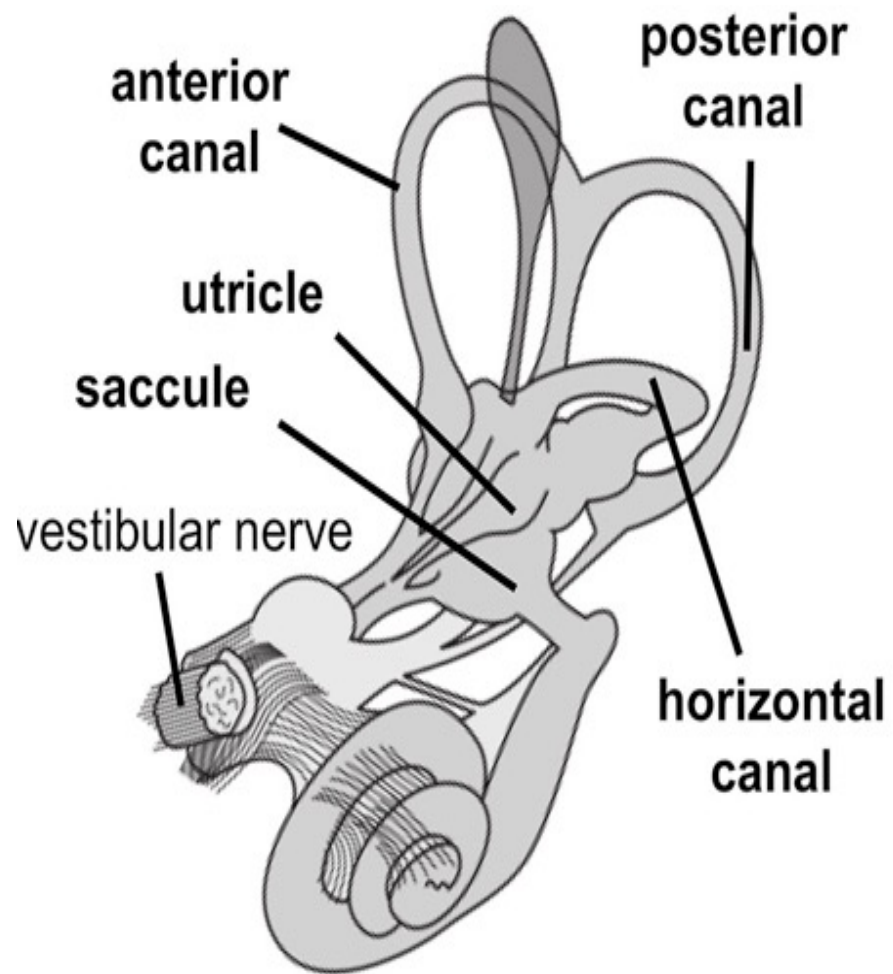
- Drawing on existentialism, Whitehead highlights how it is through physical ‘embodiment’ that humans ‘create themselves as they interact with their surroundings’ (Whitehead, 2010:26).



This is most evident in early childhood

Sensorimotor integration





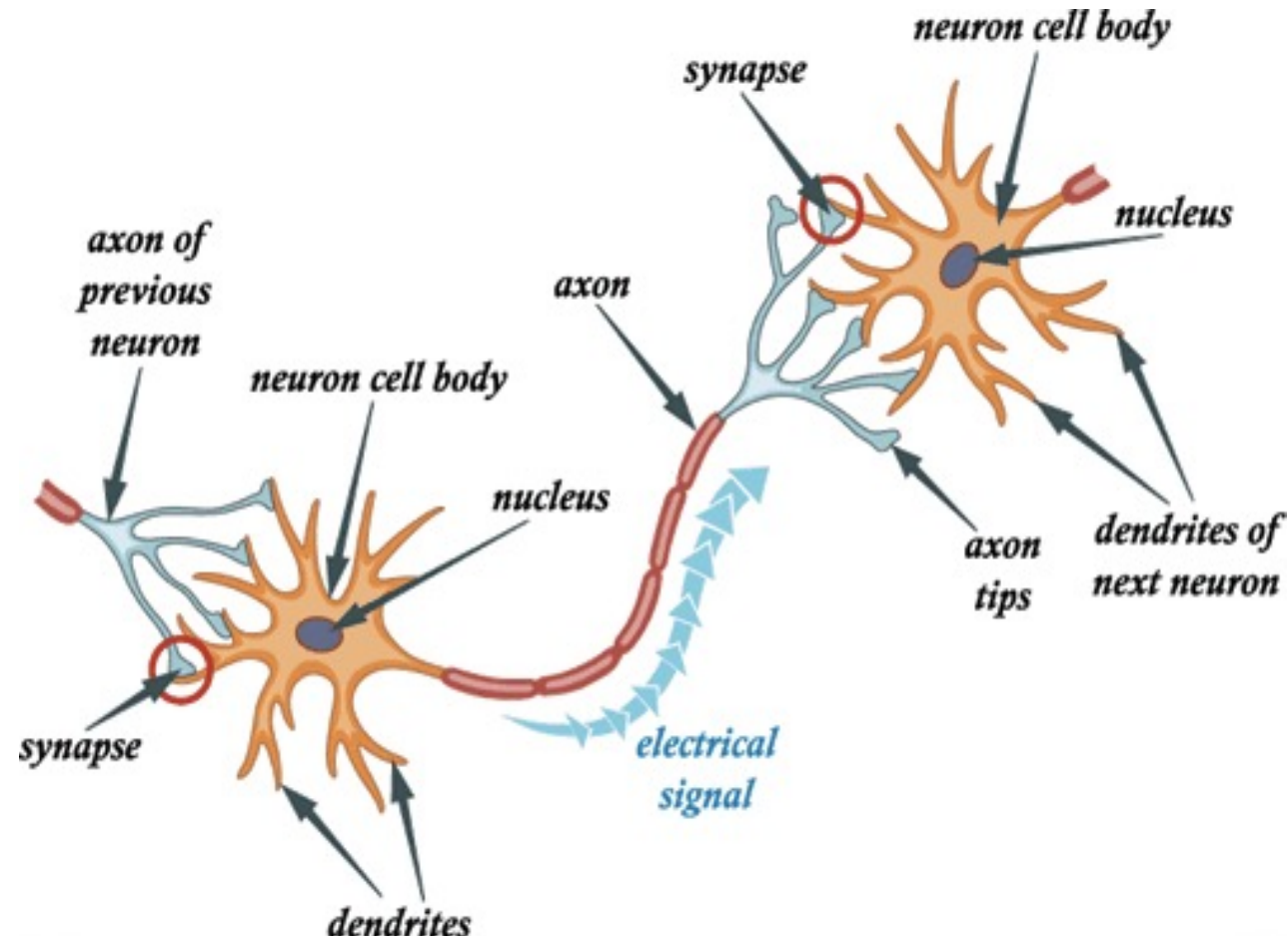
Gross and fine motor skills

- Crossing the midline
- Gross motor
- Fine motor



Moving lays the foundations for learning

- 7 or 8 yrs of moving and play are required to give the child a sensorimotor intelligence that can serve as a foundation for intellectual, social and personal and physical development
- Play consists of a series of adaptive responses that make sensory integration happen (Ayres, 2005)



Evidence from neuroscience

- ‘**Movement skills** in childhood are inextricably **linked to** core aspects of development including **social, cognitive and psychological**.... Language emerges as children **physically** interact with their surroundings...’
- Studies show **movement skills** are linked with early **language** and **literacy**, **emotional regulation**, **social behaviour** and **academic self perceptions**

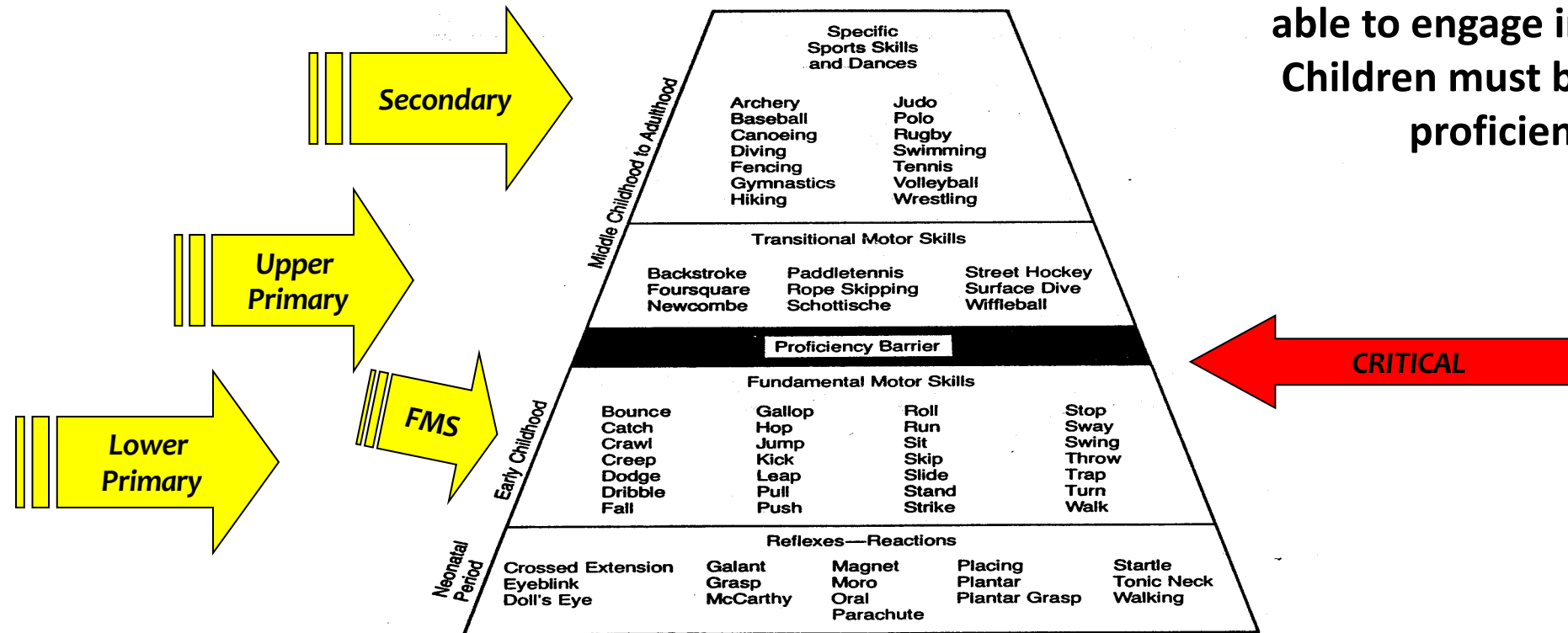
Diamond,A. (2000; 2015), Iverson, J (2010), Van der Fels et al., (2015), Bedard et al., (2017)

Early childhood lays the foundations for physical activity

- **High Quality** movement is needed to build the broad movement vocabulary needed for later physical activity

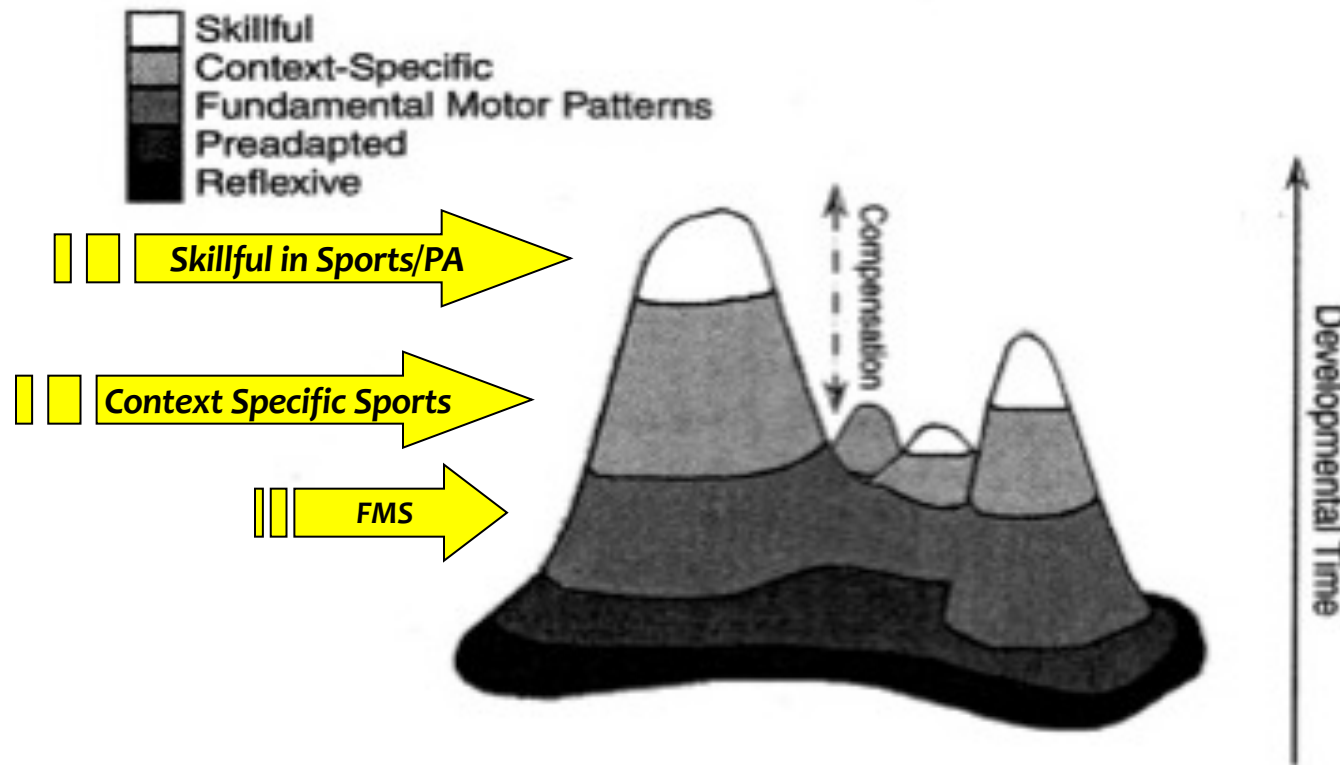


Figure 1. Progression of Motor Proficiency Skill Levels (from Seefeldt, 1980, p.317)



Competence in FMS are necessary in order to be able to engage in sports & games. Children must break through the proficiency barrier.

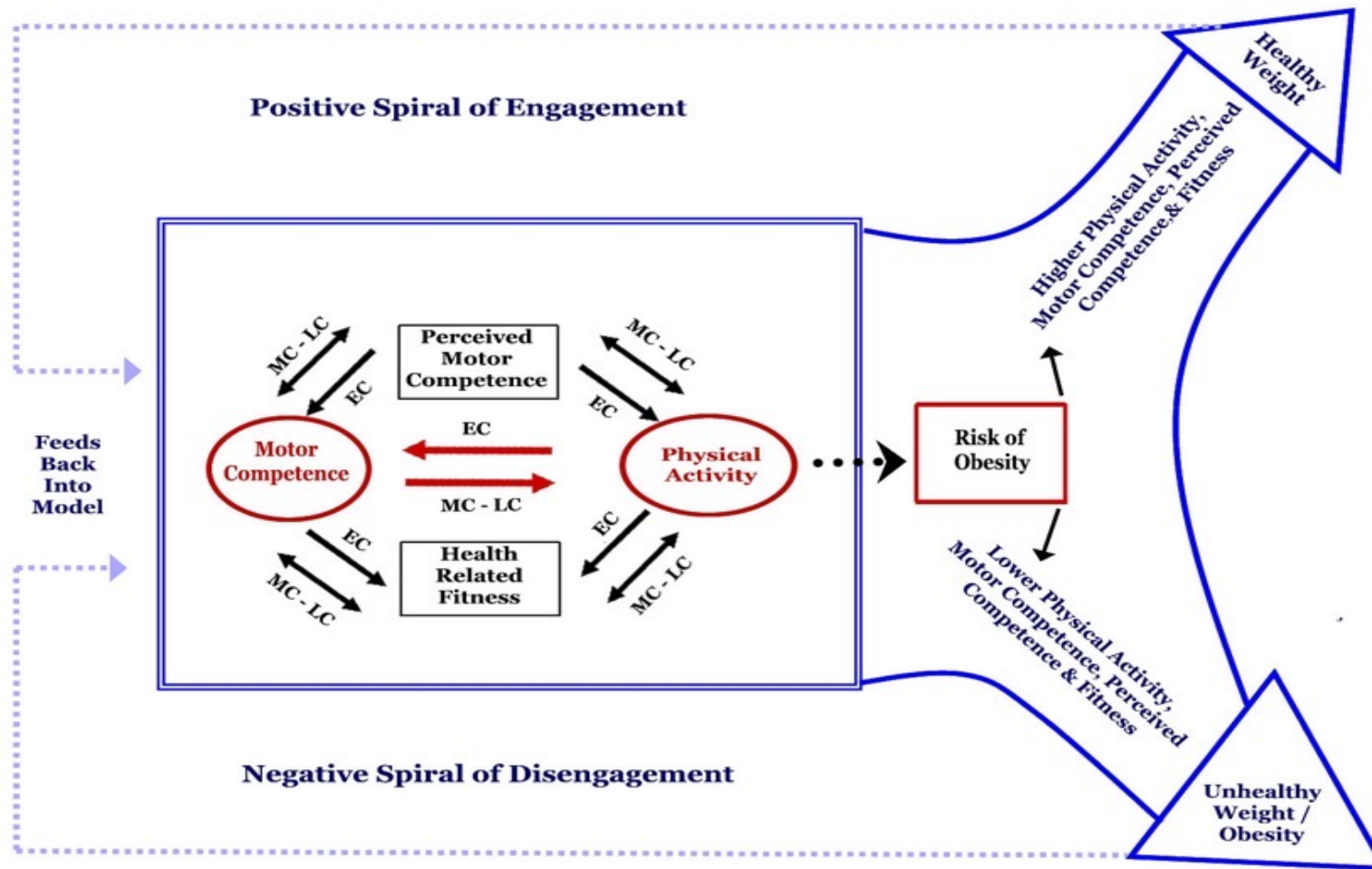
Mountain of Motor Development



FMS are the “base camp” to the mountain of motor development. Each child needs to develop MC to travel up the mountain to skillfulness.

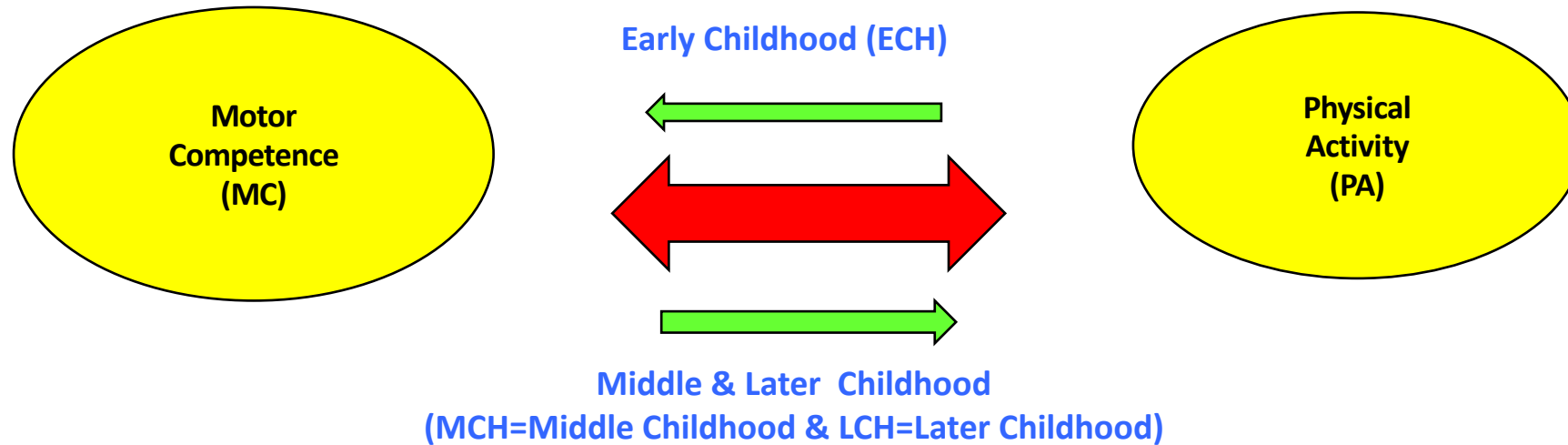
Clark & Metcalfe (2003)

Motor Competence's Role in Influencing the Physical Activity & Obesity Trajectories of Children



Stodden et al. (2008)

Physical Activity and Motor Competence



- Movement opportunities in the preschool and early primary school years (3-8 years) influences the ability to develop motor competence.
- By middle & later childhood if a child is not motor competent he/she will not chose to be physically active. If she/he is not active then their motor competence will get worse.

TAKE HOME MESSAGE

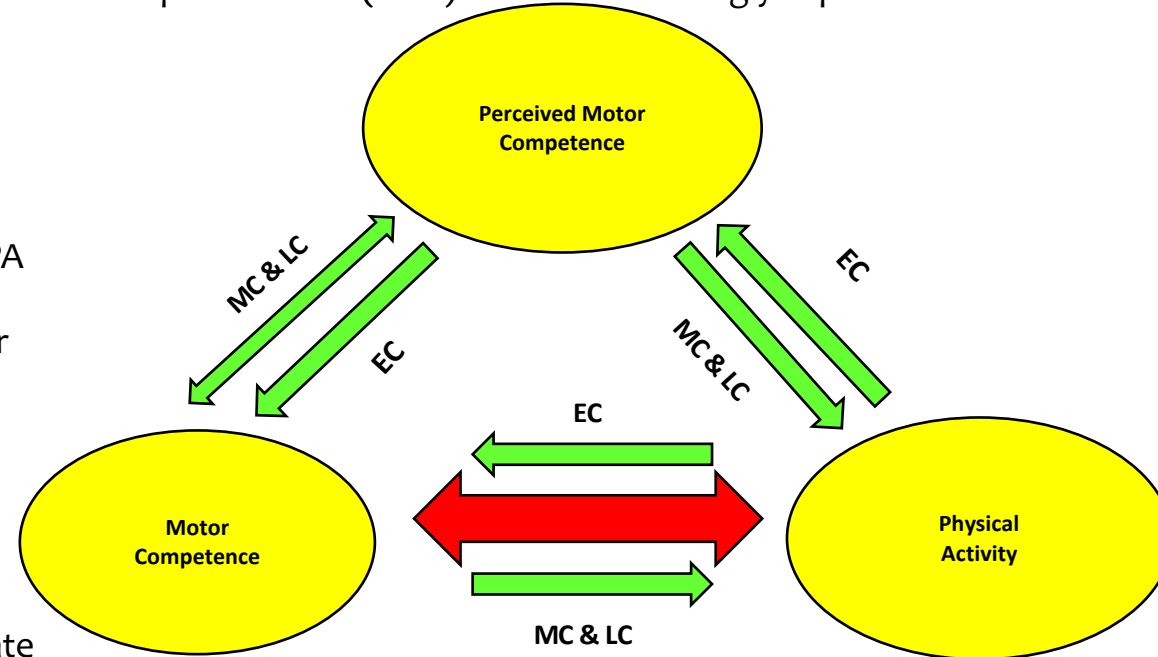
- **We need structured physical activity programs for young children that focus on developing fundamental motor skill competence.**

Relationship Between PA, MC & PMC

Perceptions of MC (PMC) become increasingly important

Early Childhood – children have limited ability to accurately judge PMC. Weak relationship between PA & PMC & MC & PMC. This can be used as an asset to promote motor acquisition in PE.

Middle Childhood – Children's cognitive capacity changes & PMC begins to play a more critical role. PMC & MC more closely approximate each other. By 7 years of age, children with low MC & low PMC are vulnerable and be much less PA.



Later Childhood – By LCH the interaction between these factors can strongly push children into a negative spiral of disengagement with low MC influencing PMC & PA negatively. It is hard to change the PA behaviors of these children at this point in time.

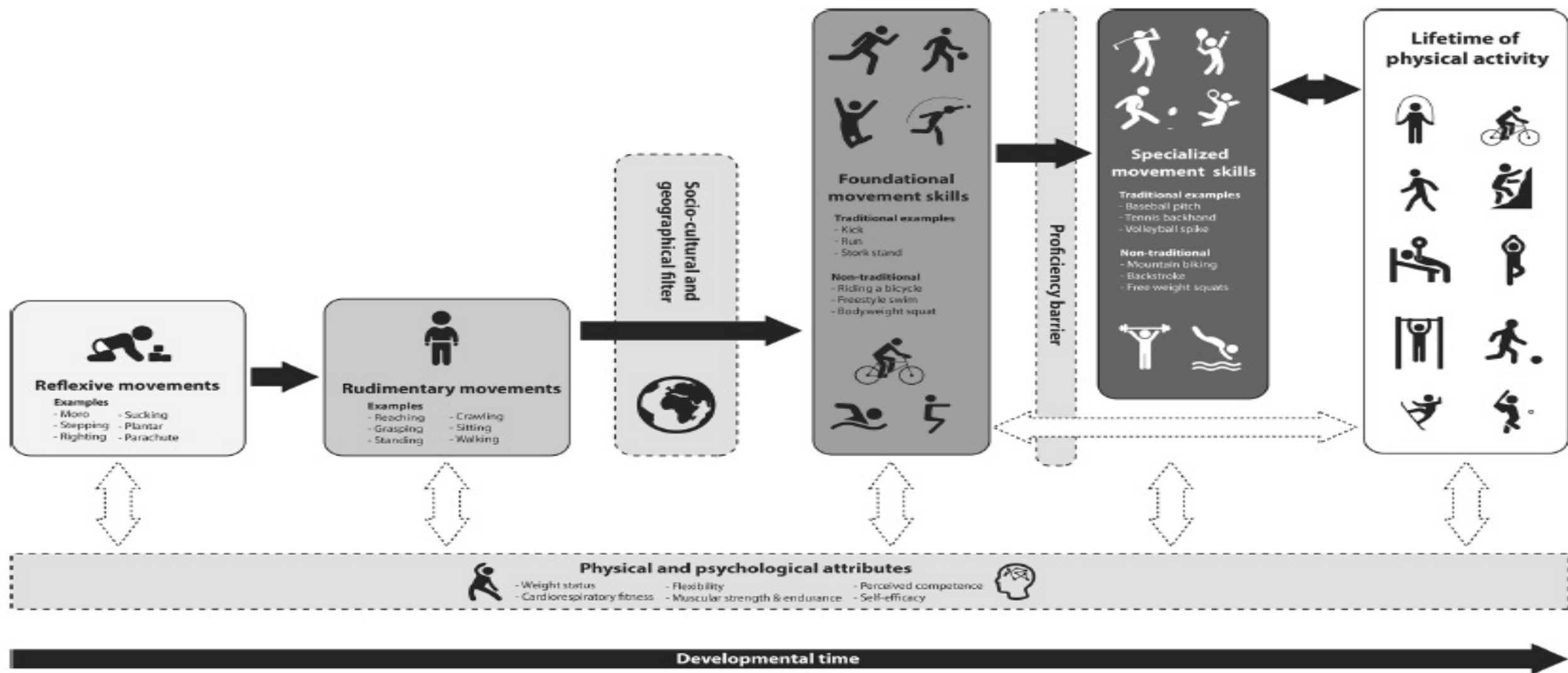


Fig. 1 Development of foundational movement skills for physical activity across the lifespan. *Black arrows* indicate previously hypothesized pathways; *white arrows* and *dotted boxes* indicate newly hypothesized pathways/components unique to this conceptual model

Play and engagement in learning

Play		Work	
Emotional cues	Environmental cues	Emotional cues	Environmental cues
Voluntary	On the floor	Compulsory	At a table
Under child's control	Lacks adult involvement	Under adult control	Includes adult involvement
Easy	No adult evaluation	Hard	Includes adult evaluation
Fun	Can be continued-focus on the process	Can be fun	Has to finish-focus on the product
	Physical		Not physical

Howard, J. and McInnes, K. (2010) 'Thinking Through the Challenge of a play-based curriculum, increasing playfulness via co-construction', in Moyles, J.R. (ed.) *Thinking about play*, Berkshire: Open University Press

How did this relate to us in Wales?

- **PhD study of the Foundation Phase in relation to Physical Literacy**
- Three phase complementarity mixed-methods design (Greene et al., 1989).
- What are the main learning outcomes of the Foundation Phase in relation to physical literacy and how are teachers interpreting these?
- Are these outcomes being achieved?
- What processes are impacting on the achievement of outcomes?
- What is the contribution to wider learning?

PHASE ONE				PHASE TWO				PHASE THREE
FEB-MAY 2011	JUNE 2011	JULY 2011	NOV 2011	DEC 2011	FEB 2012 T1	JULY 2012 T2	DEC 2012 T3	JAN 2013
	Pilot interview	Semi-structured interviews	Respondent validation	Pilot instruments	BOT-2	BOT-2	BOT-2	Analysis of schools' data, with data from phase two.
Documentary analysis					TGMD-2	TGMD-2	TGMD-2	
					Harter Scale	Semi structured Interview teachers A & B	Harter Scale	
						School A & B Reading age	School A Reading age	
						A&B spelling age	A&B PASS	
						A&B maths test	Draw a Person	
	Participant observation							
	Leuven Well being							
	Leuven involvement							
	Social Play continuum							
	Child led tours							
	Video							
					Academic learning time			
	15 min observations							

The Foundation Phase supports PL but NOT object control skills



Education 3-13

International Journal of Primary, Elementary and Early Years Education



ISSN: 0300-4279 (Print) 1475-7575 (Online) Journal homepage: <http://www.tandfonline.com/loi/rett20>



Physical Education and Sport Pedagogy



ISSN: 1740-8989 (Print) 1742-5786 (Online) Journal homepage: <http://www.tandfonline.com/loi/cpes20>

The Foundation Phase in Wales – a play-based curriculum that supports the development of physical literacy

N. Wainwright, J. Goodway, M. Whitehed, A. Williams & D. Kirk

To cite this article: N. Wainwright, J. Goodway, M. Whitehed, A. Williams & D. Kirk (2016) The Foundation Phase in Wales – a play-based curriculum that supports the development of physical literacy, *Education 3-13*, 44:5, 513-524, DOI: [10.1080/03004279.2016.1176360](https://doi.org/10.1080/03004279.2016.1176360)

To link to this article: <http://dx.doi.org/10.1080/03004279.2016.1176360>

Laying the foundations for physical literacy in Wales: the contribution of the Foundation Phase to the development of physical literacy

Nalda Wainwright, Jackie Goodway, Margaret Whitehead, Andy Williams & David Kirk

To cite this article: Nalda Wainwright, Jackie Goodway, Margaret Whitehead, Andy Williams & David Kirk (2018) Laying the foundations for physical literacy in Wales: the contribution of the Foundation Phase to the development of physical literacy, *Physical Education and Sport Pedagogy*, 23:4, 431-444, DOI: [10.1080/17408989.2018.1455819](https://doi.org/10.1080/17408989.2018.1455819)

To link to this article: <https://doi.org/10.1080/17408989.2018.1455819>



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Motivation and engagement in learning

- *Pupils were motivated to move in a variety of contexts during all aspects of their learning and they were highly engaged in their learning. (Mean Leuven score 3.7)*
- *In particular in choice activities and those that they perceived as play. ($p = .021$)*



Independence and Well-being

- Pupils were confident to move in a variety of contexts during all aspects of their learning; Pupils were highly independent in their learning they were confident and enthusiastic and able to make judgments about their own learning and achievements.*



Physical Competence

- *Children had good gross and fine motor skills*
(GMQ 61st percentile, BOT 71st Percentile)
- *Children improved their locomotor skills significantly* ($p < .001$, Eta squared .75) ... **but not object control skills.**
- *Children had high levels of perceived physical competence* (mean score 3.34 at T3. T1 – T3 $p = .016$)
- *Children were accurate at age 6 in the judgment of their physical competence.* (Spearman correlation $r_s = .56$, $p = .014$).



Why do object control skills matter?



Journal of Adolescent Health 44 (2009) 252–259

JOURNAL OF
ADOLESCENT
HEALTH

Original article

Childhood Motor Skill Proficiency as a Predictor of Adolescent Physical Activity

Lisa M. Barnett, M.P.H.^{a,*}, Eric van Beurden, Ph.D.^{b,c}, Philip J. Morgan, Ph.D.^d,
Lyndon O. Brooks, Ph.D.^c, and John R. Beard, Ph.D.^{a,c,e}

^aUniversity of Sydney, Department of Rural Health (Northern Rivers), Lismore, NSW, Australia

^bNorth Coast Area Health Service, Health Promotion Unit, Lismore, NSW, Australia

^cSouthern Cross University, Graduate Research College, Lismore, NSW, Australia

^dUniversity of Newcastle, Faculty of Education and Arts, Newcastle, NSW, Australia

^eNew York Academy of Medicine, New York, New York

Manuscript received February 8, 2008, manuscript accepted July 1, 2008

Many Children Start and Remain Inactive

- Baby prisoners (gadgets)
- Increased time in buggies
- Screen time
- Risk Aversion (Gill, 2007)
- Lack of green space / time in nature (Louv, 2008)
- Lack of active transport
- Busy working parents
- Playgrounds are often empty



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Project “SKIP” Professor Jackie Goodway

- **Successful Kinesthetic Instruction for Preschoolers**

- Motor skill programs in preschools
- Focus on FMS, MVPA, & movement knowledge
- 9-12 weeks in length
- 2 X per week for 30 to 45 mins/session
- Each sessions consisted of:
 - 10 mins of sustained activity introduction (games, dance)
 - 30 mins (3 X 10 mins) of skill instruction stations
- Participants - 4-6 year olds
 - African American, Hispanic, low income

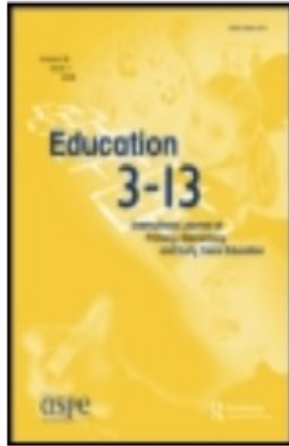


SKIP-Cymru® *(Successful Kinaesthetic Instruction for Pre-schoolers in Wales)*

- Advocacy with leadership
- Training modules at level 3 and 4
- Parental engagement sessions and parent bags
- SKIP-Cymru® developed to fit a playful pedagogy
- Not resource driven
- 2 x 45 minute sessions per week / several 20 min sessions for youngest children



SKIP-Cymru develops children's motor competence



Education 3-13

International Journal of Primary, Elementary and Early Years Education



ISSN: 0300-4279 (Print) 1475-7575 (Online) Journal homepage: <https://www.tandfonline.com/loi/rett20>

Developing children's motor skills in the Foundation Phase in Wales to support physical literacy

Nalda Wainwright, Jackie Goodway, Amanda John, Kirsty Thomas, Kate Piper, Kate Williams & David Gardener



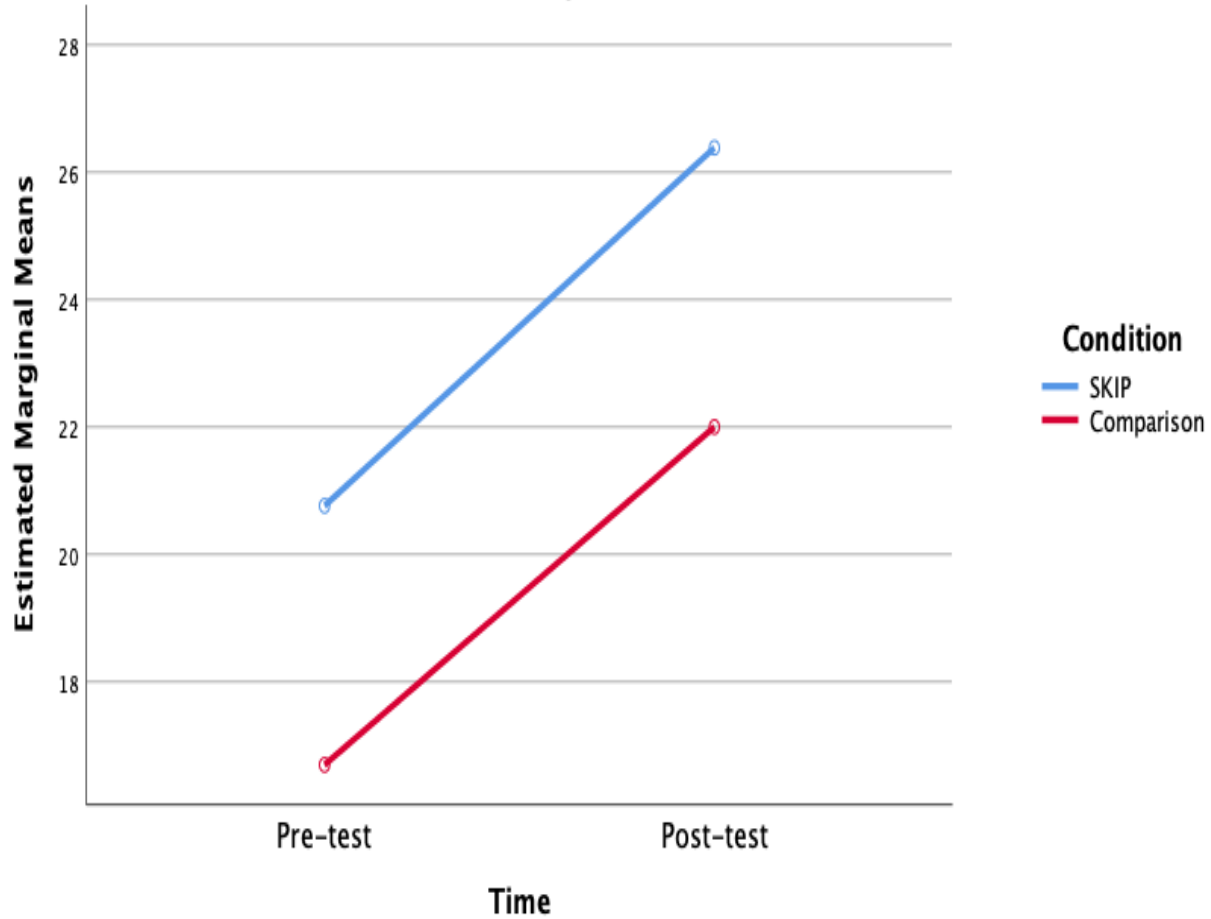
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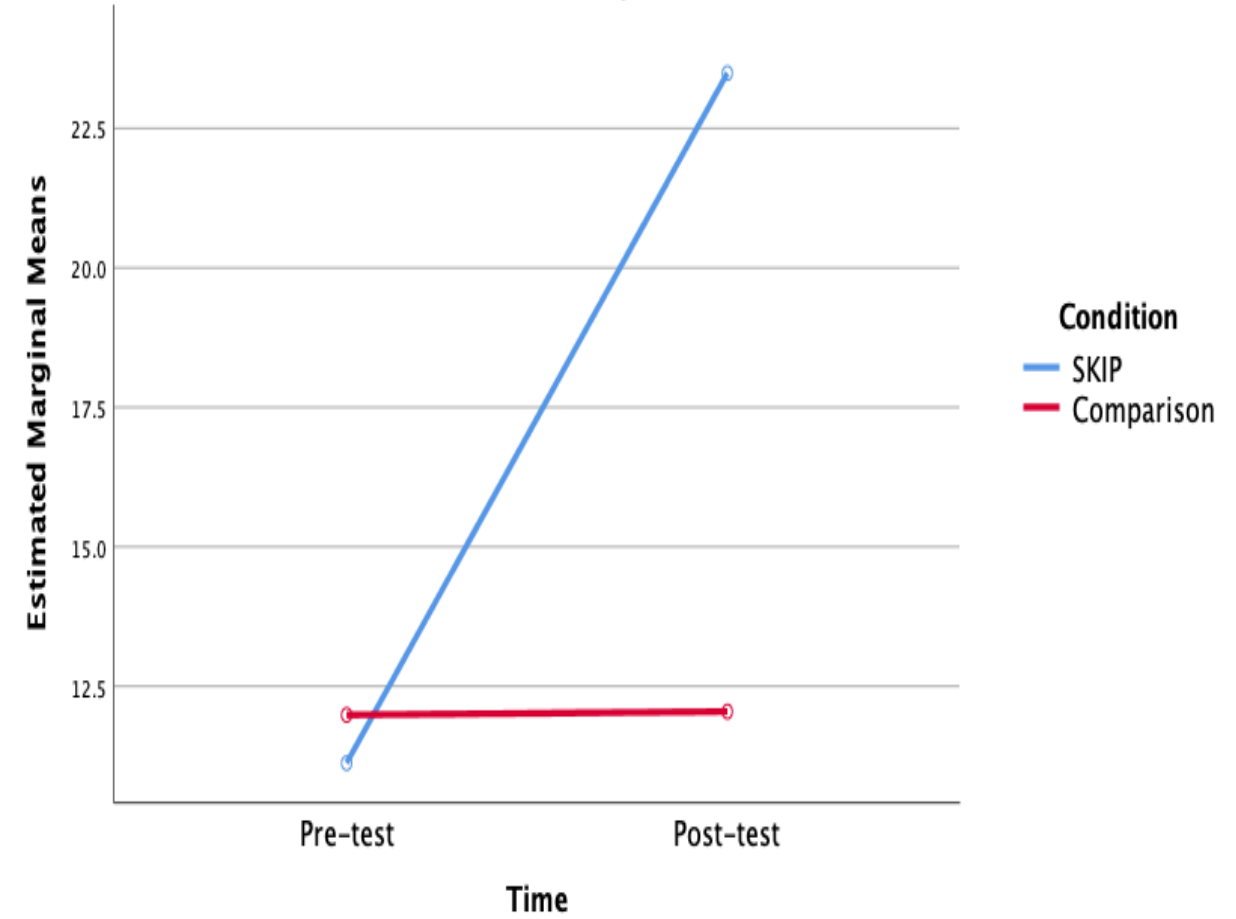


SKIP Cymru data 2018- 2019 (Dr Amanda John)

Estimated Marginal Means of locomotor

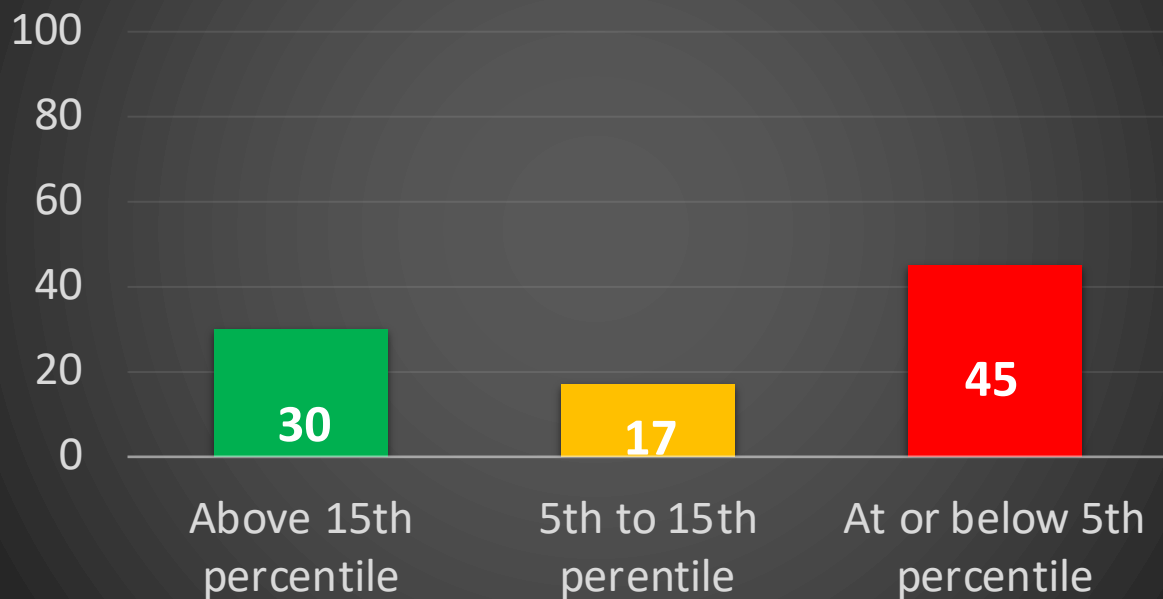


Estimated Marginal Means of OC

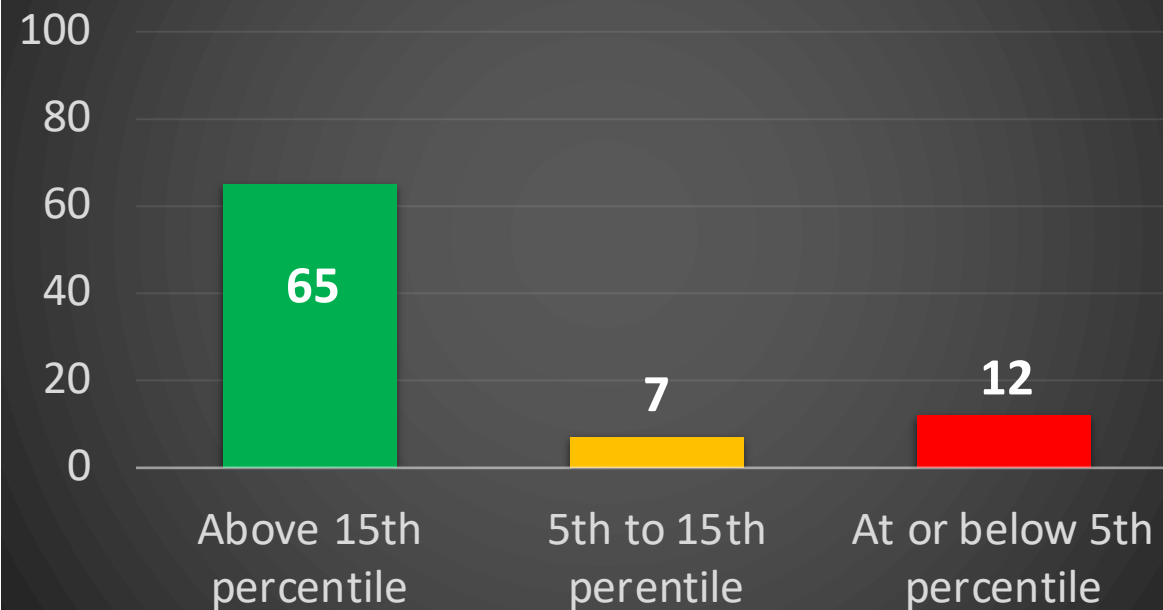


M-ABC 2018-2019

**M-ABC Baseline (n=92)
Autumn 2018**



**M-ABC Retention & Post Test 2 (n=84)
Summer 2019**



Mirrors international data

Sports Medicine

<https://doi.org/10.1007/s40279-019-01150-5>

ORIGINAL RESEARCH ARTICLE



Motor Competence Levels and Developmental Delay in Early Childhood: A Multicenter Cross-Sectional Study Conducted in the USA

Ali Brian¹  · Adam Pennell² · Sally Taunton¹ · Angela Starrett³ · Candice Howard-Shaughnessy⁴ · Jacqueline D. Goodway⁵ · Danielle Wadsworth⁶ · Mary Rudisill⁶ · David Stodden¹

© Springer Nature Switzerland AG 2019

Active Healthy Kids (AKH) 2021 report card



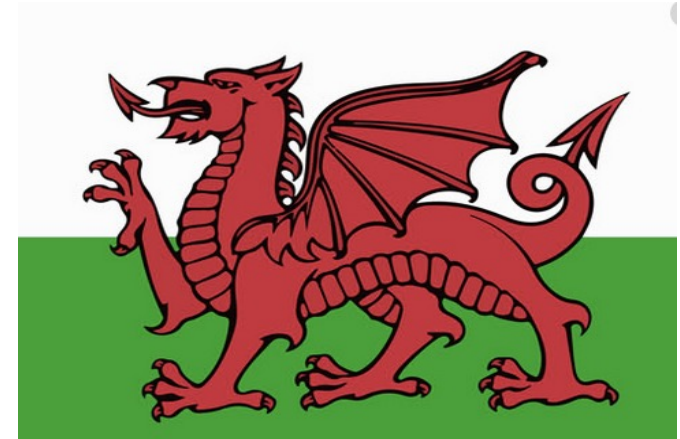
International Journal of
*Environmental Research
and Public Health*



Article

WALES 2021 Active Healthy Kids (AHK) Report Card: The Fourth Pandemic of Childhood Inactivity

Amie B. Richards ^{1,*}, Kelly A. Mackintosh ¹, Nils Swindell ¹, Malcolm Ward ¹, Emily Marchant ²,
Michaela James ², Lowri C. Edwards ³, Richard Tyler ⁴, Dylan Blain ⁵, Nalda Wainwright ⁵,
Sarah Nicholls ⁶, Marianne Mannello ⁷, Kelly Morgan ⁸, Tim Evans ⁹ and Gareth Stratton ¹



Recommendations from motor development

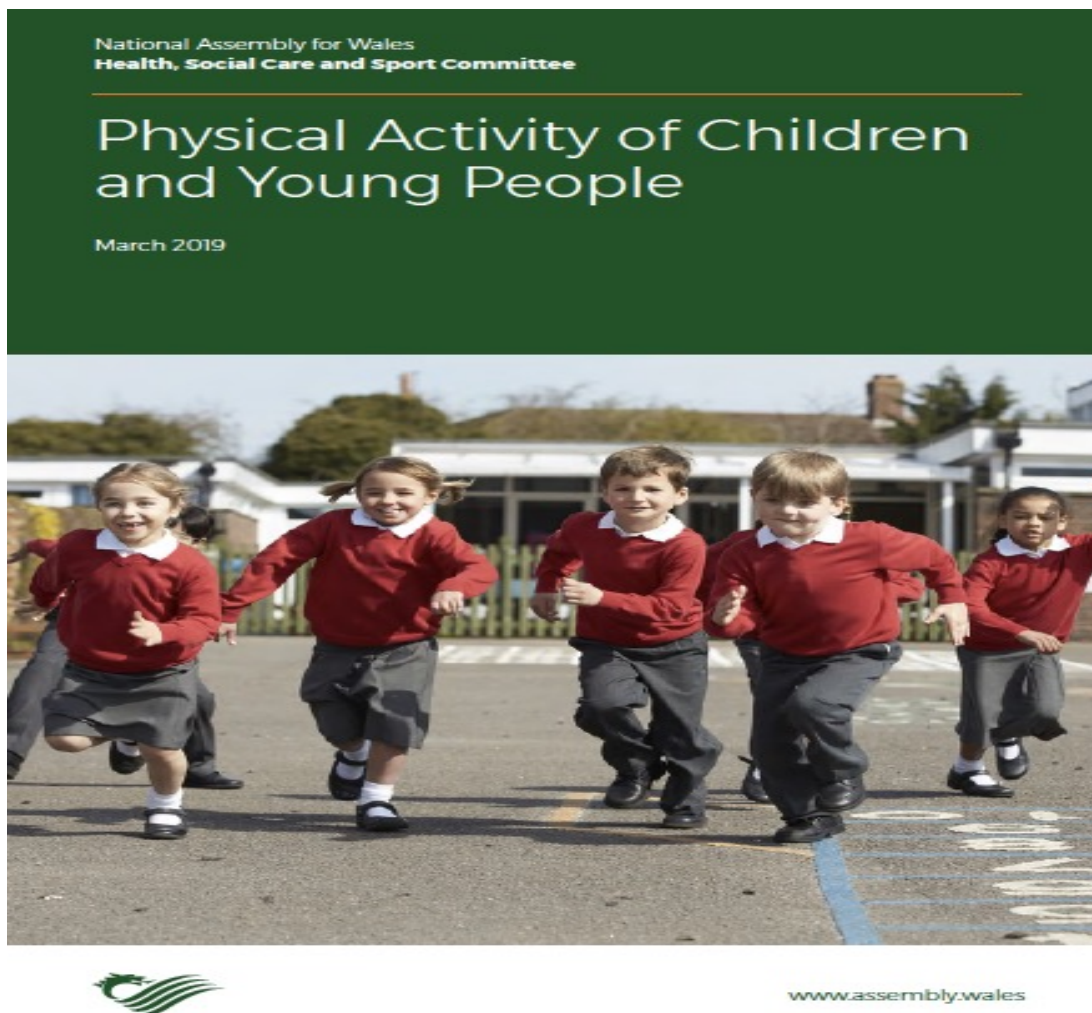
ALL kids need early Intervention!!!

It is 4xs harder to change behaviors in 4th grade than in pre-k/k¹⁵⁻¹⁸

- Neuroplasticity
- Intervene early to create positive developmental trajectories for health

Brian et al., 2019

SKIP Cymru has gained national recognition



**A Journey to
A Healthier Wales**

- 1. A compassionate nation:** Support people to act with compassion, to facilitate understanding of mental well-being
- 2. An active nation:** Increase the benefits of physical activity for everyone
- 3. Place-making and designing-in community health and well-being:** Enable places to support the health and well-being of people and communities
- 4. Seamless, preventative organisations and services:** Ensure services support people to understand behaviours and choices that benefit future health



Building expertise for high quality & consistent messaging

- <https://www.uwtsd.ac.uk/wahpl/training-courses/>



Principles of SKIP underpin a range of work

- Footie Families



(Anna Stevenson PhDc)

- Foundations for Sport

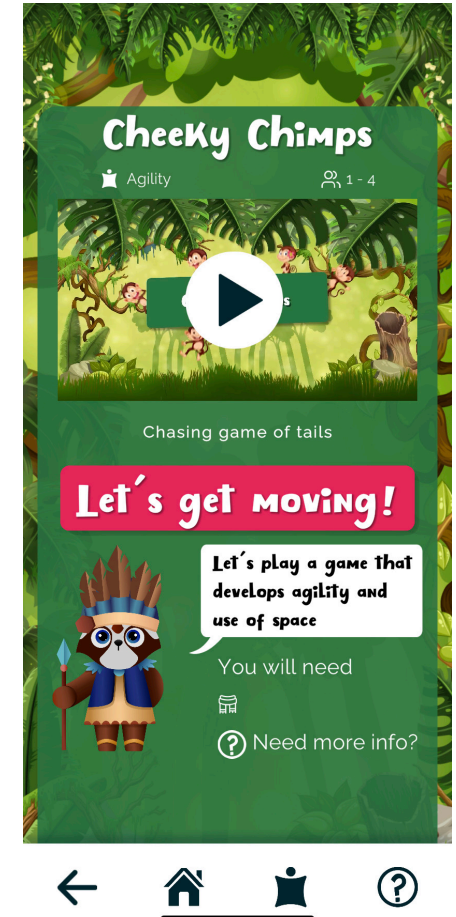
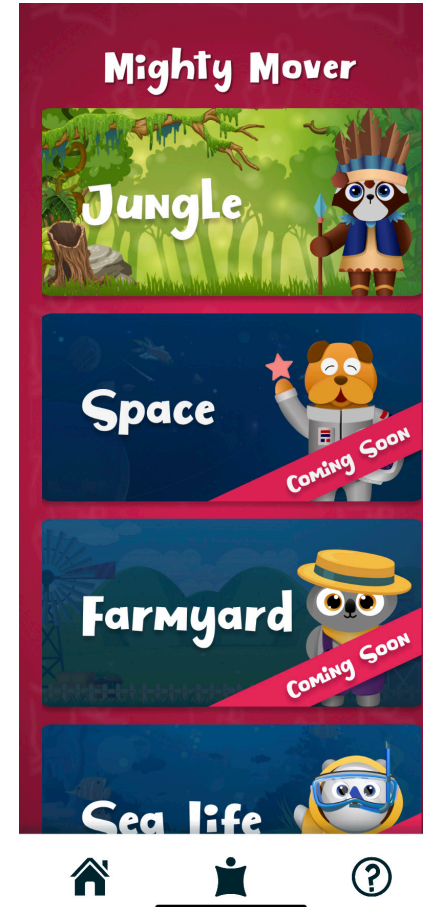


The MiniMovers App

- The MiniMovers (MM) APP enables parents to support their children's motor competence (MC) with **developmentally appropriate** activities and equipment.



Mini
Mighty
Mega



MiniMovers

- Supporting parents to support their children
- <https://minimovers.org/>



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Physical literacy and the outdoors

Remember this from earlier ?

It is through physical ‘embodiment’ that humans ‘create themselves as they interact with their surroundings’ (Whitehead, 2010:26).



Affordances

- Affordance theory states that the world is perceived not only in terms of object shapes and spatial relationships but also in terms of object possibilities for action (affordances) — perception drives action. J. J. Gibson (1904-1979)
- We need to ensure that children are given the opportunities to experience a wide variety of affordances from early childhood to ensure good motor development.



The theory of affordances

- "The affordances of the environment are what it offers to the animal, what it provides or furnishes..."
 - However they are relevant to the animal...eg. Solid ground give support for animals to stand, walk run etc. But a marsh land and water is sink-into- able into depending on the weight of the animal ...or supporting of weight if you are a bug
- Gibson p 127

THE ECOLOGICAL APPROACH TO VISUAL PERCEPTION



James J. Gibson

CORNELL UNIVERSITY

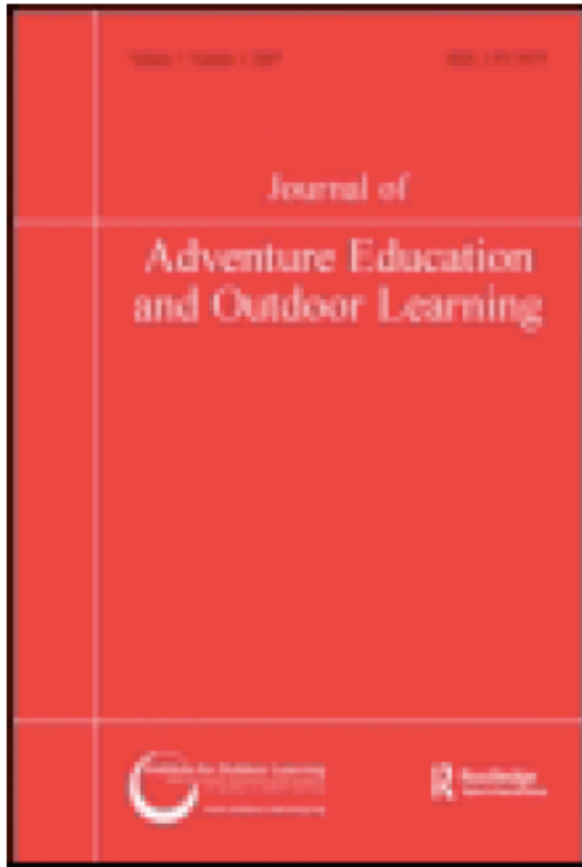


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Task

- What are the affordances of these for adults, children and animals ?
- Lake
- Beach
- Tree
- Carpark
- Can you think of some more?



Journal of Adventure Education & Outdoor Learning

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/raol20>

Outdoor education gives fewer demands for action regulation and an increased variability of affordances

Tove Anita Fiskum ^a & Karl Jacobsen ^b

^a Nord-Trøndelag University College, Levanger, Norway

^b Norwegian University of Science and Technology, Trondheim, Norway

Published online: 24 Jul 2012.

How does this relate to physical literacy?

- Discuss in pairs
- Considering the theory of affordances how does the outdoors make a unique contribution to physical literacy?

Interesting article on moodle

Review

Affordances for Motor Skill Development in Home, School, and Sport Environments: A Narrative Review

**Fábio Saraiva Flôres^{1,2}, Luis P. Rodrigues^{3,4},
Fernando Copetti², Frederico Lopes¹, and
Rita Cordovil^{1,5} **

Perceptual and Motor Skills
0(0) 1–23

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Next week

- When you are in Cynefin consider the range of affordances at the site, and think about what opportunities for physical development are at the site from the range of affordances



Thank you – Questions?

- N.wainwright@uwtsd.ac.uk @naldaw @Phys_Lit_Wales

