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# Exploring physical literacy in health care: from theory to practice



Prof. Alexandre Mouton

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## Introduction

### Born and raised in Liège, Belgium

- Master and Phd in Physical Education (2014)
- Professorship at Liège University (2019)
- Invited Prof. At Melbourne University + other collaborations



MONASH  
University



### PETE

Physical education  
didactics



### PA Promotion

Encourage an active  
lifestyle across lifespan



### Physical Literacy

From school to health  
context





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01

# Why Physical Literacy?

# Why Physical Literacy?

## THE BENEFICIAL EFFECTS OF PHYSICAL ACTIVITY IN CERTAIN DISEASES

METABOLIC		PULMONARY	
<b>type II diabetes</b>  <ul style="list-style-type: none"> <li>cardiovascular and all-cause mortality</li> <li>control of blood glucose</li> </ul>	<b>asthma</b>  <ul style="list-style-type: none"> <li>physical aerobic aptitude and endurance (VO2 max*)</li> <li>quality of life</li> <li>symptoms (number of symptomless days)</li> </ul>		
<b>type I diabetes</b>  <ul style="list-style-type: none"> <li>physical aerobic aptitude</li> <li>lipid profile</li> <li>insulin-resistance and insulin requirements</li> </ul>	<b>cancer</b>  <ul style="list-style-type: none"> <li>quality of life</li> <li>fatigue</li> <li>aerobic capacity, muscle strength</li> <li>weight, BMI and body fat</li> </ul>		
<b>obesity</b>  <ul style="list-style-type: none"> <li>visceral fat</li> <li>maintenance of initial weight loss</li> </ul>	<b>inflammatory rheumatism</b>  <ul style="list-style-type: none"> <li>pain, harmful effects</li> <li>functioning (RA, AS)**</li> </ul>		
CARDIOVASCULAR		OSTEOARTICULAR	
<b>coronary diseases</b>  <ul style="list-style-type: none"> <li>quality of life</li> <li>VO2 max*</li> <li>blood pressure</li> <li>muscle strength</li> <li>heart rate</li> <li>mortality and rehospitalization</li> </ul>	<b>lower-limb osteoarthritis</b>  <ul style="list-style-type: none"> <li>pain</li> <li>functioning</li> </ul>		
<b>chronic heart failure</b>  <ul style="list-style-type: none"> <li>biological markers</li> <li>quality of life</li> <li>VO2 max*</li> </ul>	<b>depression</b>  <ul style="list-style-type: none"> <li>depression symptoms</li> <li>anxiety/depression symptoms following another chronic disease</li> </ul>		
<b>stroke</b>  <ul style="list-style-type: none"> <li>functioning (walking distance)</li> <li>VO2 max*</li> </ul>			

\* VO2 max : Maximum volume of oxygen consumed  
 \*\* PR : rheumatoid arthritis  
 ++ SPA : ankylosing spondylitis  
 ↳ Improvements  
 ↳ Limitations

Illustrations : Floris Arnhem

ANSES (2019)

## BARRIERS TO PHYSICAL ACTIVITY FOR ADULTS WITH ARTHRITIS

**41%** of people with arthritis are inactive, due in large part to 4 barriers:



**1 PHYSICAL**  
 (pain and fatigue)



**2 PSYCHOLOGICAL** (lack of motivation and fear of pain)



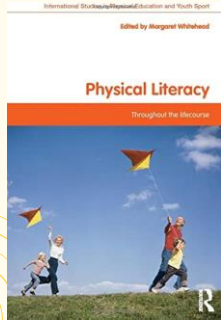
**3 SOCIAL** (lack of a support system)



**4 ENVIRONMENTAL** (costly fees, no transportation and lack of access to safe places to exercise)

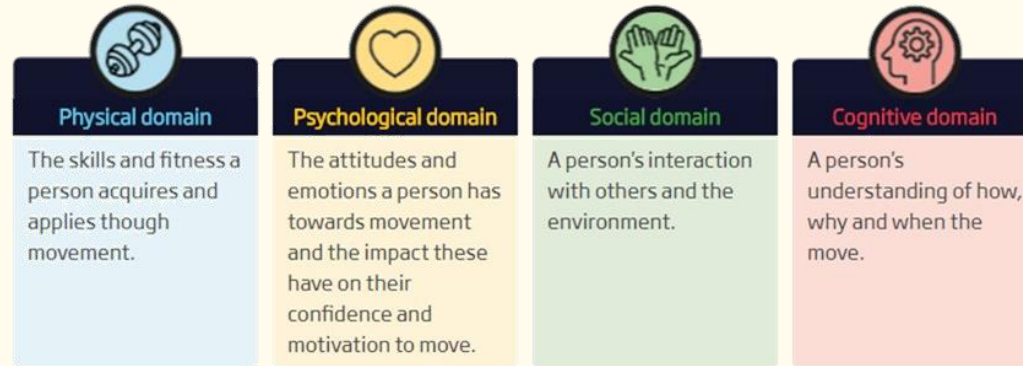
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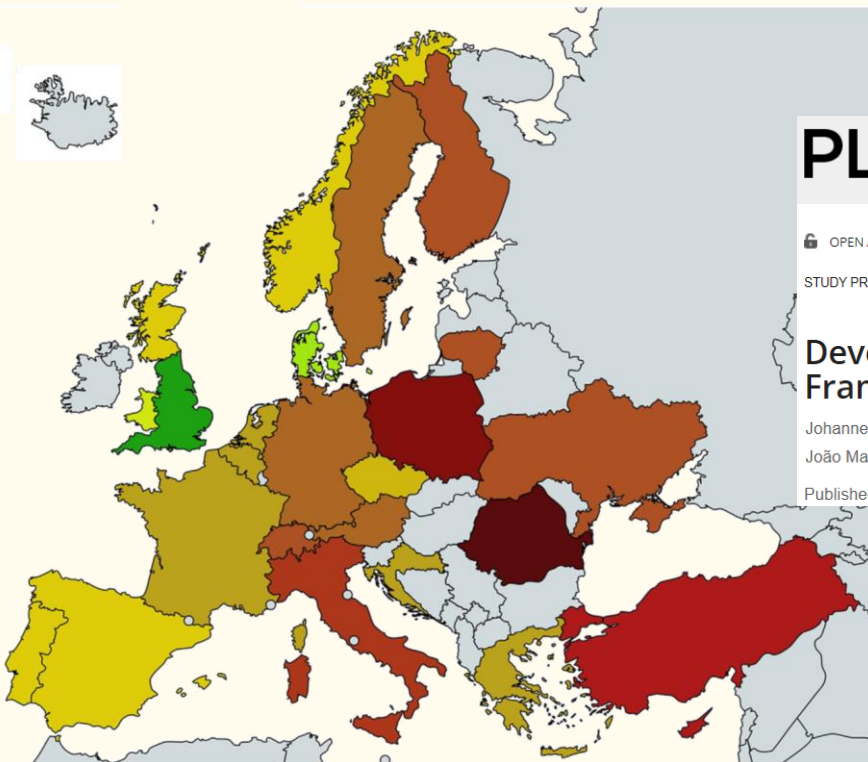


“Motivation, confidence, physical competence, knowledge, and understanding to value and take responsibility for engagement in physical activities for life”

*International Physical Literacy Association (2017), inspired from Whitehead (2001)*



0.0  
0.5  
1.0  
1.5  
2.0  
2.5  
3.0



## Physical Literacy implementation in Europe

Carl, ..., Mouton, et al. (2023a)

## PLOS ONE

OPEN ACCESS

STUDY PROTOCOL

### Development of a Global Physical Literacy (GloPL) Action Framework: Study protocol for a consensus process

Johannes Carl , Emiliano Mazzoli, Alexandre Mouton, Raymond Kim-Wai Sum, Amika Singh, Marlen Niederberger, João Martins, Dean Kriellaars, Nigel Green, Peter Elsberg, Dean A. Dudley, John Cairney, Jaime Barratt, Lisa M. Barnett

Published: August 12, 2024 • <https://doi.org/10.1371/journal.pone.0307000>



## PL in Health: one of the “blank spots”

- Most physical literacy research is focused on children, few in adults, almost none in older adults and chronic disease populations ✕
- Greater emphasis is placed on the physical domain of physical literacy, leaving the remaining domains (social, cognitive, and psychological) underrepresented/understudied ✕
- Health care practitioners are not yet engaged with the construct of physical literacy in practice

*Cornish et al. (2020)*  
*Carl et al. (2022; 2023a)*

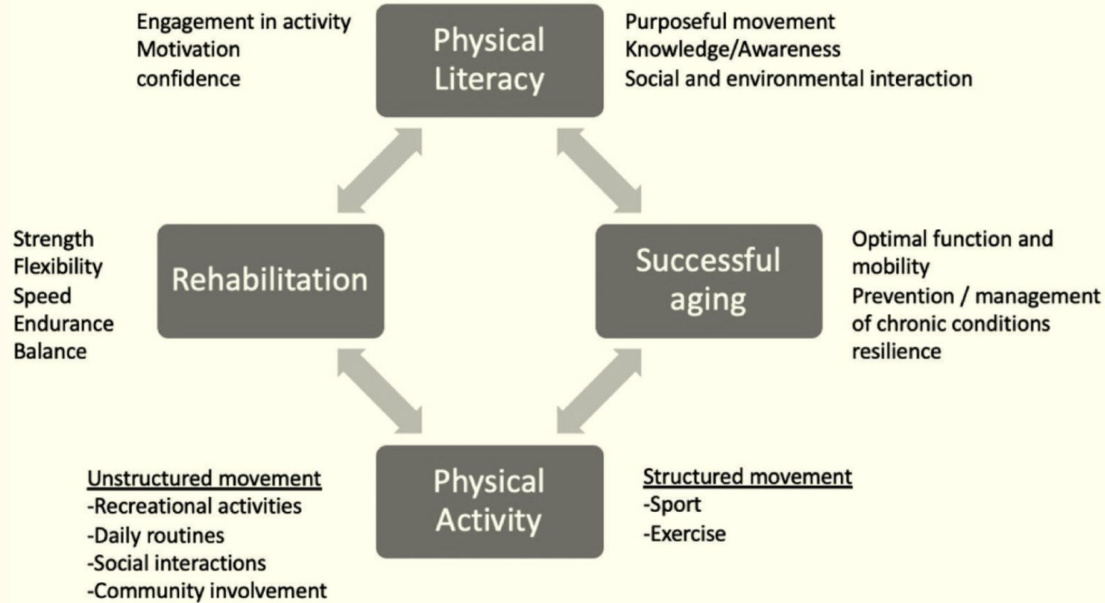
01

# Why Physical Literacy?



Missing bridge between healthcare and autonomous physical activity

Marsault (2017)



## Physical literacy for adults through a rehabilitation lens

*Petrusevski et al. (2022)*

02

# PL pilot intervention in chronic disease

# Objective & Methods



Explore the effects of a physical literacy assessment and counselling session in chronic disease participants



Longitudinal quasi-experimental study  
(T1= pre-intervention, T2= 2 months post-intervention)



Control vs Experimental group design



GC = 38 (52,6% ♀ ; 64 yrs median)



Adult (+18) with chronic disease

GE = 44 (70,5% ♀ ; 64 yrs median)



Recruitment of 3 medical centres in the Province of Liege (Belgium)

## Design of the intervention

APA specialist



40-items 4 PL dimensions questionnaire  
4 physical tests  
Aggregate PL score /100 (/25 per dimension)



Referral

PL assessment  
(T0)

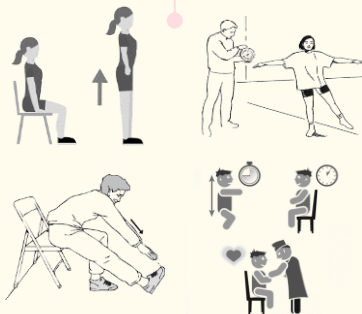
direct

PL  
counselling

+ 2 months

Follow-up  
assessment (T1)Healthcare  
professionals

GP, Physio, Psycho, Nurse

Motivational interviewing  
technique

Individual goals-oriented

Link with community PA



## Results

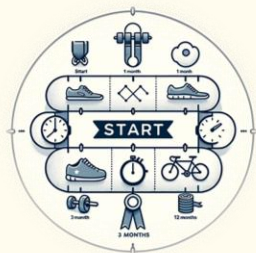
PL dimensions	T0			T1 (+2 months)		
	GC (n=38)	GE (n=44)	Inter-group P-value	GC (n=38)	GE (n=44)	Inter-group P-value
Psycho.	74,47	70,52	0,23	70,94	72,09	0,73
Social	71,02	74,91	0,24	70,39	77,45	0,03
Cognitive	61,05	69,68	>0.001	60,24	73,93***	>0.001
Physical	59,01	52,53	0,05	59,59	54,34	0,10
PL total score	66,39	66,91	0,81	69,35	69,46**	0,2

\*only mean values presented; ask about IC variability & SD  
P-value \*<0,05;\*\*<0,01;\*\*\*<0,001

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10494085/>

# Discussion of the first study

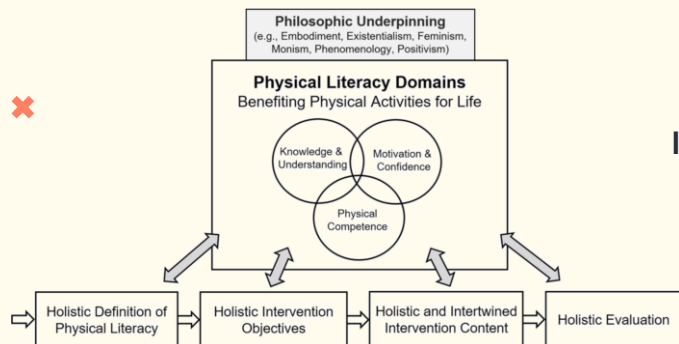
Increase follow-up duration



Reinforcing bridge with community PA



Integrate LP into adapted PA programs



Carl et al. (2023b)

Physical Literacy Interventions Reporting Template



Weerts & Mouton (2023)

[https://www.chuliege.be/jcms/c2\\_26224880/en-mouvement-pour-ma-sante](https://www.chuliege.be/jcms/c2_26224880/en-mouvement-pour-ma-sante)







Explore effects of a physical literacy-based intervention on adults with chronic diseases



Longitudinal quasi-experimental pilot study  
(T0= pre-intervention, T1= post-intervention, T2 follow-up: not yet available)



Preliminary results for Control vs APA+ PL Group



GC = 6 (52,6% ♀ ; 64 yrs median)

Adult (+18) with chronic disease



GE = 6 (70,5% ♀ ; 64 yrs median)

# Intervention design

1. Physical activity behaviour and engagement
2. Physical competence
3. Motivation and confidence
4. Knowledge and understanding
5. Social interaction
6. Meaningful and purposeful activities



12 items-Q  
6 PL dimensions  
4 Physical test

## LP group sessions

12 participants/group max  
PE/APA specialist

Control  
group

APA  
group

APA + PL  
group

Medical  
referral

PL Assessment

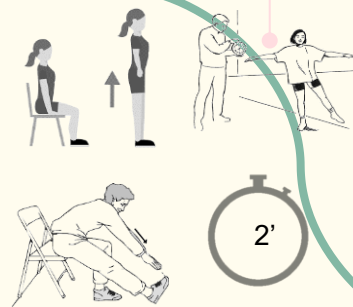
12 weeks APA  
(+PL) sessions

+ post-cycle

Follow-up  
Assesments

+ 3 months

GP



Motivational interviewing  
technique (phone call)

Individual goals-oriented

Link with community PA

Individual PL follow-up



Session n°	PL domains	PL-oriented content focus
1	Pre-intervention  PL assessment	30 minutes of LP evaluation; group divided into two: 15 minutes of questionnaires for group 1 and 15 minutes of physical tests for group 2 and vice versa.
2-7	(1)+(2)	<ol style="list-style-type: none"> <li>1. Raise awareness of current personal physical activity (PA) habits in playful form.</li> <li>2. Encouragement to practice through the provision of monitoring tools (watches, pedometers, home exercises, calendars) inviting participants to initiate the practice of PA outside the session.</li> </ol>
3-8	(1)+(3)	<ol style="list-style-type: none"> <li>1. Information and awareness about PA in and its dimensions (types, recommendations, benefits).</li> <li>2. Exchange on the physical environmental offer (park, trails, sport facilities, etc.) and social (sports group, association, etc.) of AP available at local level.</li> </ol>
4-9	(1)+(4)	<ol style="list-style-type: none"> <li>1. Experimentation of collective/cooperative exercising situations (pairs or groups).</li> <li>2. Invitation to extend practice outside the sessions by involving the entourage; awareness of the participant's potential role as an PA initiator.</li> <li>3. Invitation to practice between participants beyond the session cycle.</li> </ol>
5-10	(1)+(5)	<ol style="list-style-type: none"> <li>1. Collective identification of key barriers to participant PA; valuing the progress of each.</li> <li>2. Role-playing, taking responsibility of the participants in the session to increase the perception of skills.</li> </ol>
6-11	(1)+(6)	<ol style="list-style-type: none"> <li>1. Sensitisation of the participant towards PA who have meaning in his daily life.</li> <li>2. Diversification of exercise modalities (music, groups, new formats) to solicit pleasure.</li> <li>3. Autonomous choice of exercises and modalities by participants</li> </ol>
12	Post-intervention  PL assessment	30 minutes of evaluation LP: Group divided into two: 15 minutes of questionnaires for group 1 and 15 minutes of physical tests for group 2, and vice versa.

(1) Physical competence (2) Physical activity behaviour/engagement in physical activity (3) Knowledge/understanding  
(4) Motivation and confidence for physical activity (5) Environment interactions (6) Meaningful/purposeful activities

## Results

PL dimensions	T0			T1 (+2 months)		
	GC (n=6)	GE (n=6)	Inter-group P-value	GC (n=6)	GE (n=6)	Inter-group P-value
Behav./Eng	3,5	4,25	0,54	4	5,5 <sup>†</sup>	0,29
Motivation	6	7	0,66	6,5	7	0,13
Know./Und.	7	7	0,66	7	8	0,03*
Social Inter.	7	8	0,13	6	8	0,23
Meaningful	6	8	0,18	7,5	8	0,07 <sup>†</sup>
Phys. comp.	4,8	5,6	0,15	5,2	7,6*	0,009**
PL total score	33,55	36,9	0,23	35,5	43,4 <sup>†</sup>	0,008**

\*only median values (/8; total score /48) are presented; ask about IC variability  
P-value <sup>†</sup><0,1 \*<0,05;\*\*<0,01;\*\*\*<0,001



03

# Future directions



# Mapping the Physical Literacy Journey

Exploring Physical Literacy Through Biographical Mapping:

- In Health and Physical Education (submitted)
- In the context of Health \*



# Biographical Mapping Approach for Physical Literacy (BMAP-PL)

Informed by:

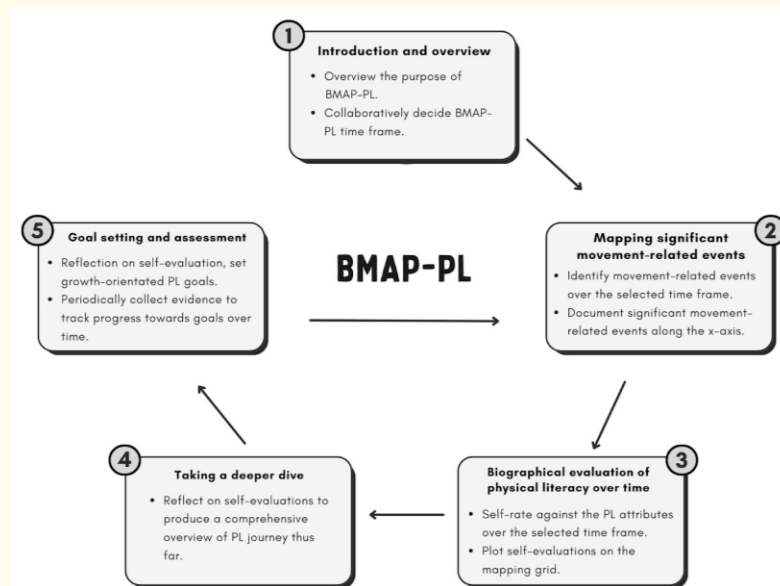
- Thiel et al.'s (2011) biographical mapping method
- Whitehead's phenomenological embodiment version of PL
- IPLA's PL Matrix (Whitehead, 2019)

Properties:

- Personal
- On-going
- Non-linear



BMAP-PL in H/PE involves five steps





# (c) Biographical anchored evaluation of PL overtime

## PHYSICAL LITERACY BIOGRAPHICAL MAP

Name: Hannah

Age: 12 Year: 2024

Motivation
  Physical Competence  
 Confidence
  Knowledge and Understanding

Physical Literacy Attributes	Avoiding	Limiting	Moderating		Maximising
	0-2	3-4	5-6	7-8	9-10
<p><b>Motivation</b> (think of how you were feeling at the time point selected. Which statement most closely matches your thoughts at that time)</p>	<p>I like to do a lot of things, but I don't do much &lt;physical activity&gt;. I don't have the time, energy, or interest. I don't really want to get involved and make &lt;physical activity&gt; a part of my routine, whether I'm alone or with others. I am not that interested in learning about &lt;physical activity&gt;.</p>	<p>I do a little &lt;physical activity&gt; when I can but find it hard to stay motivated. I am interested, but it's difficult to make &lt;physical activity&gt; a priority among other things, whether I'm alone or with others. I might consider learning more about &lt;physical activity&gt;.</p>	<p>I do &lt;physical activity&gt; somewhat regularly and it is usually part of my routine. I enjoy &lt;physical activity&gt; and am looking for more ways to do it, whether I'm alone or with others. I want to know more about &lt;physical activity&gt;.</p>	<p>I do a lot of &lt;physical activity&gt;, it's part of my regular routine. &lt;Physical activity&gt; is important to me, and I make sure to prioritise it where I can, whether I'm alone or with others. I am excited to know more about &lt;physical activity&gt;.</p>	<p>&lt;Physical activity&gt; is a core part of who I am, and I make it a priority throughout the week. I stay involved, find new ways to do &lt;physical activity&gt; and enjoy it, whether I'm alone or with others. I am always looking for ways to learn more about &lt;physical activity&gt;</p>

Time →

0  
 Performed in Ballet recital  
 Started walking to school  
 Got 2nd place school cross country  
 Moved up a level at ballet  
 Changed school  
 Stopped walking to school  
 Rode a horse for the 1st time  
 Got a new bike for Christmas  
 Went hiking with family on holiday

## (e) Goal setting and assessment

- Having generated their PL narratives, students establish PL goals and targets that can help form the basis of ongoing assessment.

**PHYSICAL LITERACY GOALS**

Name: \_\_\_\_\_  
Class: \_\_\_\_\_ Year: \_\_\_\_\_

**Motivation**

**Physical Competence**

**My Physical Literacy Goals**

**Confidence**

**Knowledge and Understanding**

**Prompt:** What do you want to achieve? What do you want to know, learn or be able to do? How will you get there?

# Pilot study



## Correlation between BMAP & LLPAQ

Lifetime Leisure Physical Activity Questionnaire  
(LLPAQ; Engeroff, 2018):

20 adults in Austria (age range: 45-65)

- Overall:  $r = 0.53$ ,  $p = 0.02$

## Qualitative feedback:


- Reflection Opportunity 
- Active Participation 
- Visual Method

# Other perspectives


- Correlate the PLAS PL assessment tool (Naylor et al.) with the BMAP-PL

Physical Activity, Health and Exercise

## Development of the Physical Literacy in Adults Scale (PLAS)

Annaleise Naylor , Andrew Flood, Lisa M. Barnett & Richard Keegan

Pages 1099-1111 | Received 20 Nov 2023, Accepted 16 Jul 2024, Published online: 24 Jul 2024

 Cite this article

 <https://doi.org/10.1080/02640414.2024.2383486>



- Collaborate on the validation of the PLAS in other languages (French) and populations (chronic disease)
- Develop and assess of PL interventions in adults or specific populations (Canberra – Liège)

# Thank you for your attention

Exploring physical literacy in  
health care: from theory to  
practice



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# Personal references

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<http://orbi.ulg.ac.be/ph-search?uid=U205676>

URL Teachings' list:

[https://www.uliege.be/cms/c\\_9054334/en/directory?uid=U205676](https://www.uliege.be/cms/c_9054334/en/directory?uid=U205676)

URL LinkedIn

<https://www.linkedin.com/in/mouton-alexandre-4a2b3b15/>

URL Google Scholar

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