#PHC23

BREAKOUT SESSION:
PRESERVING HEALTH

Building healthy cities: nature, lifestyle, and sustainable mobility for well-being

TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

WAGENINGEN UNIVERSITY & RESEARCH

Utrecht University

UMC Utrecht

HEALTHY TRANSPORTATION IN HEALTHY CITIES

#PHC23

Dick Ettema
UU

Active transport for healthy cities,
but what should planners do?

Dick Ettema

Benefits of active travel and how to promote it

- Active travel is associated with reduced risk of cardiovascular diseases, strokes and various cancers, diabetes, arterial thrombosis, high blood pressure, better cardiorespiratory fitness and better mental health

- But….
  - how to promote active travel in practice?
 - What factors to prioritize?

Utrecht
University

Aim of this presentation

- Present some key findings from our research regarding walking and cycling in cities (in a quiz-like way) and provide suggestions for policy

Question 1: what is the most prevalent type of walking in the Netherlands?

a.   Transportation walking (walking to a destination)

b.   Recreation walking (e.g., walking the dog)

c.   Walking to the bus stop or train station

It is recreation walking!

Gao et al., 2020
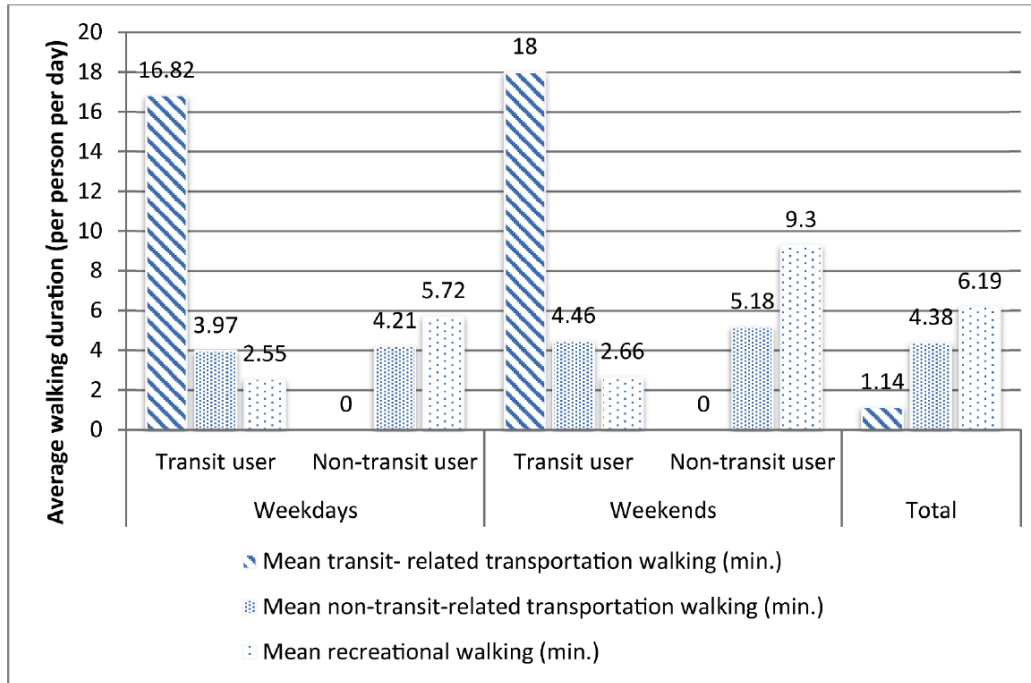
Promoting walking through walkability

• Walkability is a function of density (population and services), land use mix, intersection density, green space, sidewalk density, PT density)
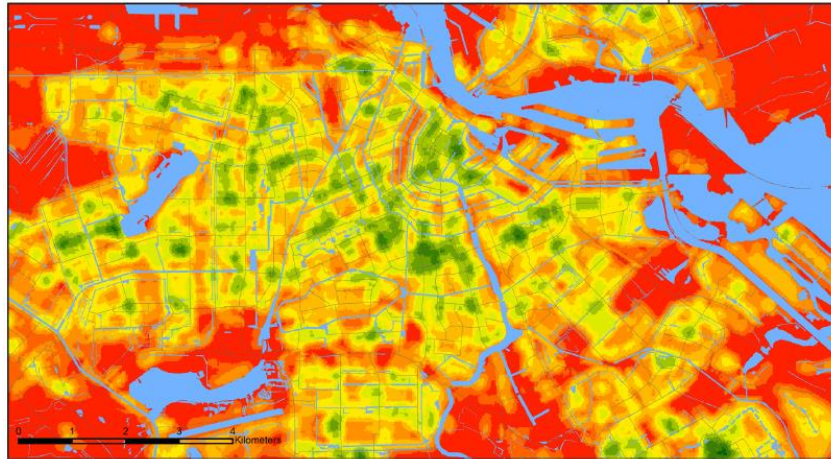

Fig. 1 Walkability index map 150 m buffer size for the Netherlands (top left), the densely populated region of Randstad (top right) and the city of Amsterdam (bottom). Walkability is scaled from 0 to 100 where red denotes the 10% lowest walkability scores, and green denotes the 10% highest walkability scores

Lam et al., 2022

Promoting walking through walkability

- Higher walkability is found to have a positive effect om the amount of walking, but is this effect stronger

    a. In urban areas

    b. In rural areas?

    c. All the same

    a. For low SES people

    b. For high SES people?

    c. All the same

Promoting walking through walkability

- Walkability as a function of density (population and services), land use mix, intersection density, green space, sidewalk density, PT density)

Stratum	N	Total time walked (minutes)	Discretionary time walked (minutes)	Non-discretionary time walked (minutes)
Highly urban	3704	5.1 (2.5, 7.8)	5.5 (2.7, 8.3)	3.0 (−1.0, 6.9)
Urban	7741	7.2 (4.8, 9.6)	9.1 (6.1, 12.1)	3.3 (0.9, 5.6)
Rural	4610	10.4 (6.7, 14.2)	9.1 (4.7, 13.5)	11.0 (6.4, 15.6)
Low neighbourhood SES 16 [11.6]	5390	8.5 (6.1, 10.9)	7.2 (4.6, 9.7)	9.9 (6.1, 13.8)
Middle SES 13 [11.8]	5339	9.0 (6.6, 11.5)	9.3 (6.4, 12.3)	6.4 (3.8, 9.0)
High SES 13.7 [11.4]	5326	7.6 (5.1, 10.1)	9.1 (6.0, 12.3)	3.2 (0.8, 5.6)

Utrecht University

Lam et al., 2022

Promoting walking through walkability

•	Walkability is joint function of density (population and services), land use mix, intersection density, green space, sidewalk density, PT density. But do these factors have an equal weight?
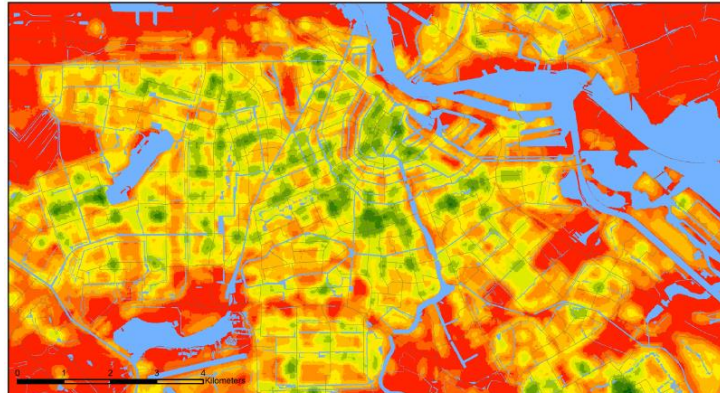

Fig. 1 Walkability index map 150 m buffer size for the Netherlands (top left), the densely populated region of Randstad (top right) and the city of Amsterdam (bottom). Walkability is scaled from 0 to 100 where red denotes the 10% lowest walkability scores, and green denotes the 10% highest walkability scores

Question 2: what built environment factor most strongly influences the amount of walking?

a. greenspace
b. land use mix
c. blue space
d. residential density
e. Cul-de-sacs
f. ≥4-way crossing

Question 2: what built environment factor most strongly influences the amount of walking?

Wang et al., 2021
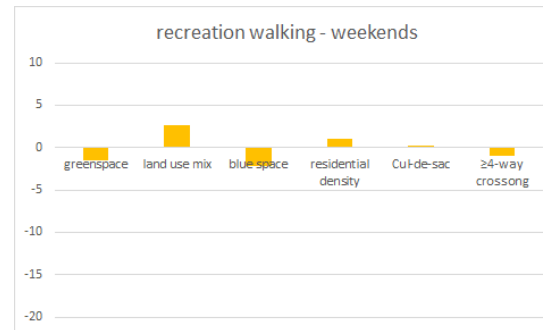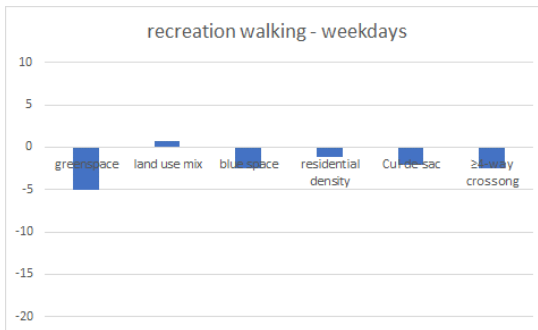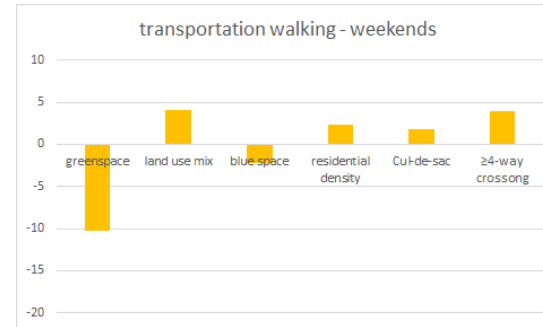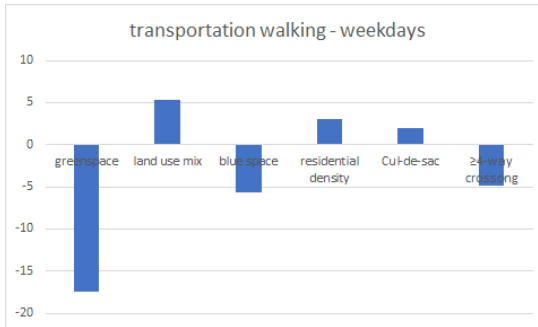
Are land use metrics everything that counts? What about the way streets look?

Analyze Streetview images using AI
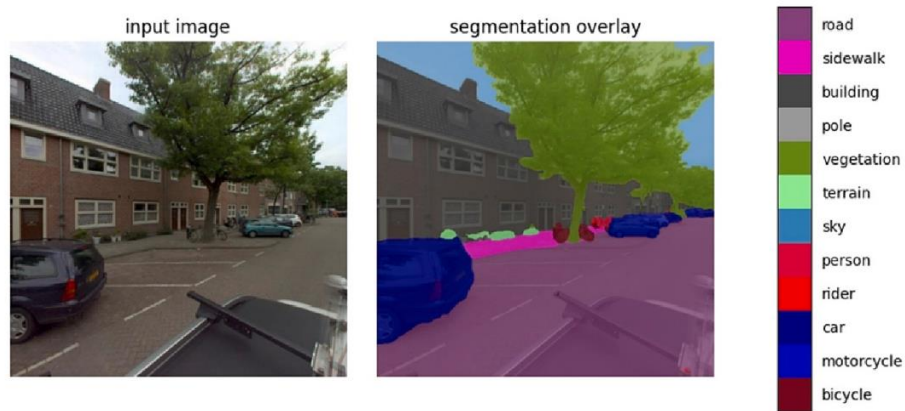
Computing the share of 'view' covered by..
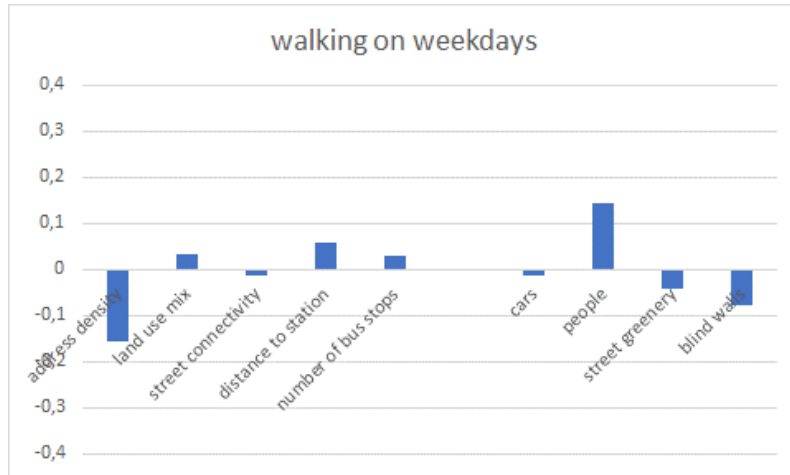

Fig. 1. Input SV image (left) and labelled image after segmentation (right).

Are land use metrics everything that counts? What about the way streets look?

What Streetview element has the largest impact on the amount of walking?

a. Cars
b. Greenery
c. People
d. Blind walls

Are land use metrics everything that counts? What about the way streets look?
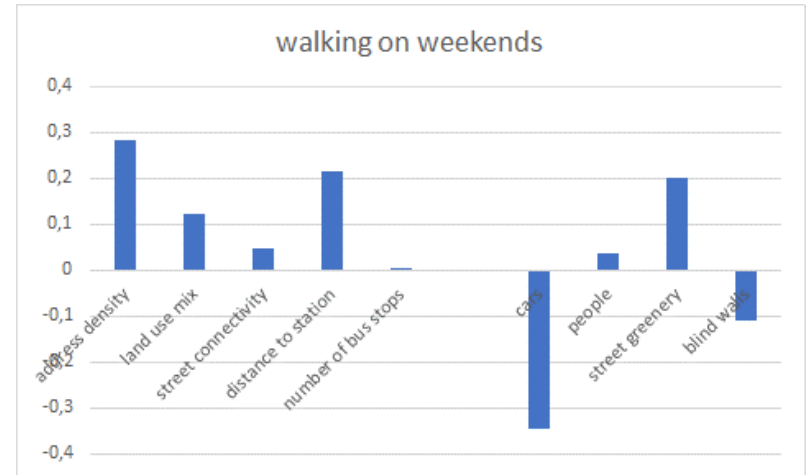
Liu et al., 2023

**And what of you walk really fast (running)?**

What elements of/in the built environment refrain people from running?

a. Pedestrians
b. Cyclists
c. Cars
d. Dogs
e. Scary strangers
f. Poor lighting
g. Uneven or slippery surface

And what of you walk really fast (running)?

What elements of/in the built environment refrain people from running?

Effects on running frequency

Ettema, 2016
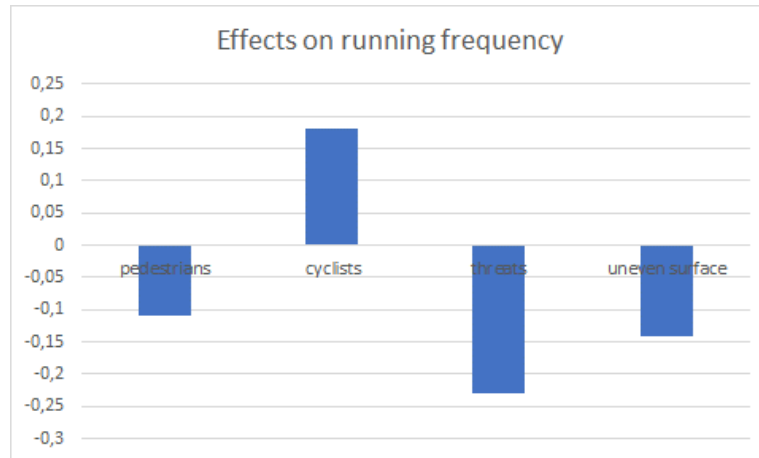
Takeaway points

- Promote public transport use
- Promote mixed land use
- Built environment matters more for transportation walking
- Walkability more important in rural areas
- Focus on visual aspects of green

BREAKOUT SESSION – PRESERVING HEALTH

#PHC23

Yvonne Vendrig – de
Punder
UMCU

Things that can go wrong when measuring noise exposure and annoyance in the renovation of social housing appartments

Yvonne Vendrig

IGLO Utrecht

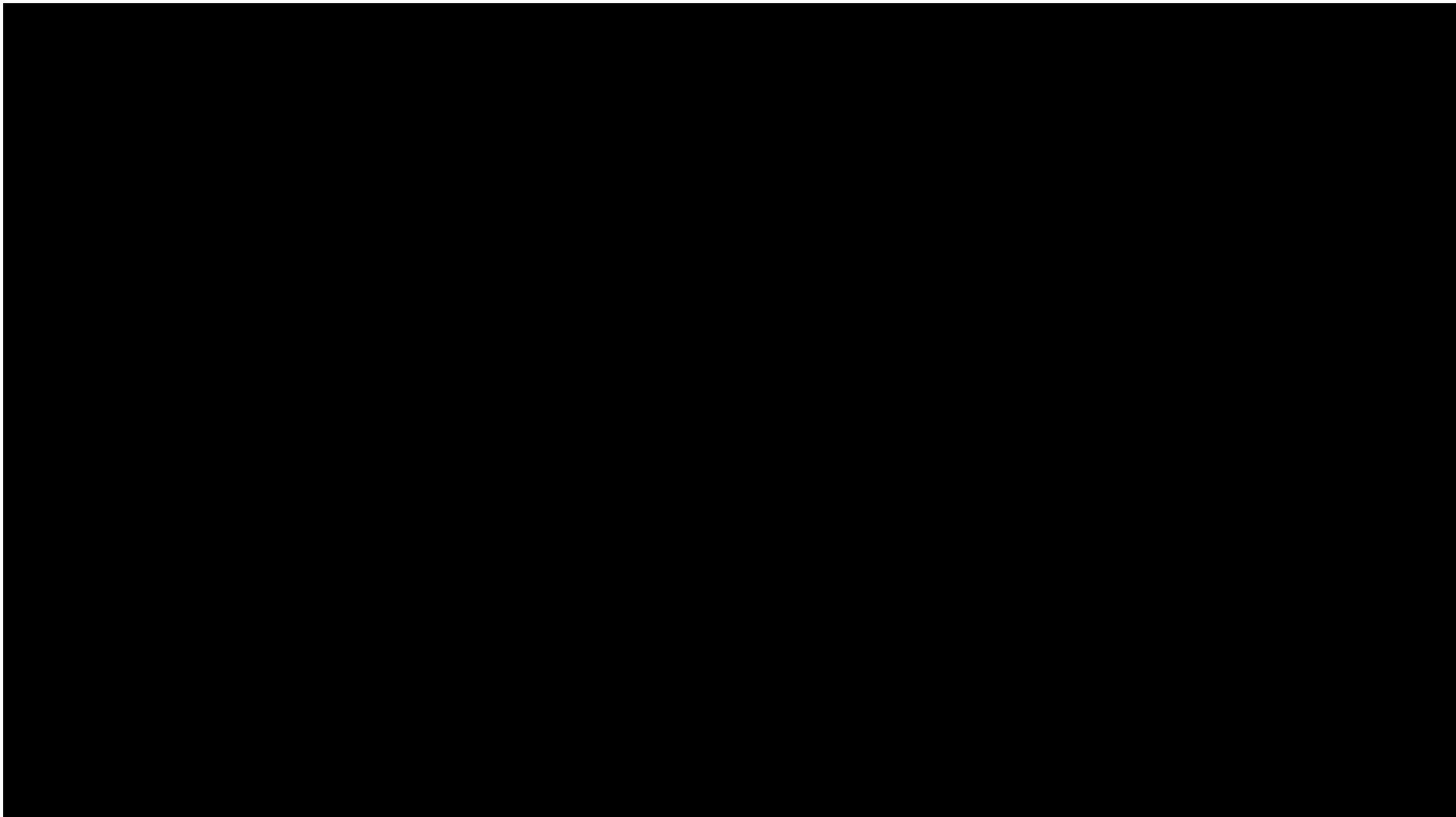EWUU conference 7-12-2023

Universiteit Utrecht | Gemeente Utrecht | UMC Utrecht

Holistic housing renovation

Motivation substudy noice annoyance

Many complaints about noice annoyance by residents and perceived inability to act in professionals
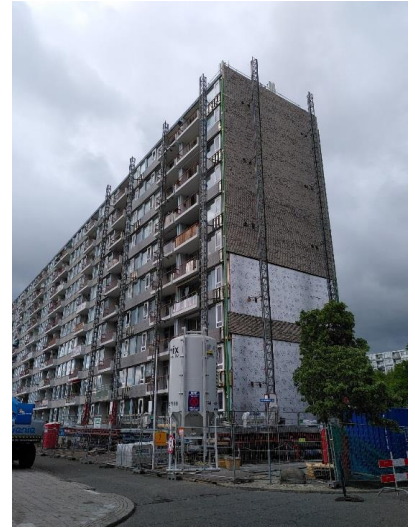
Health effects of noise exposure
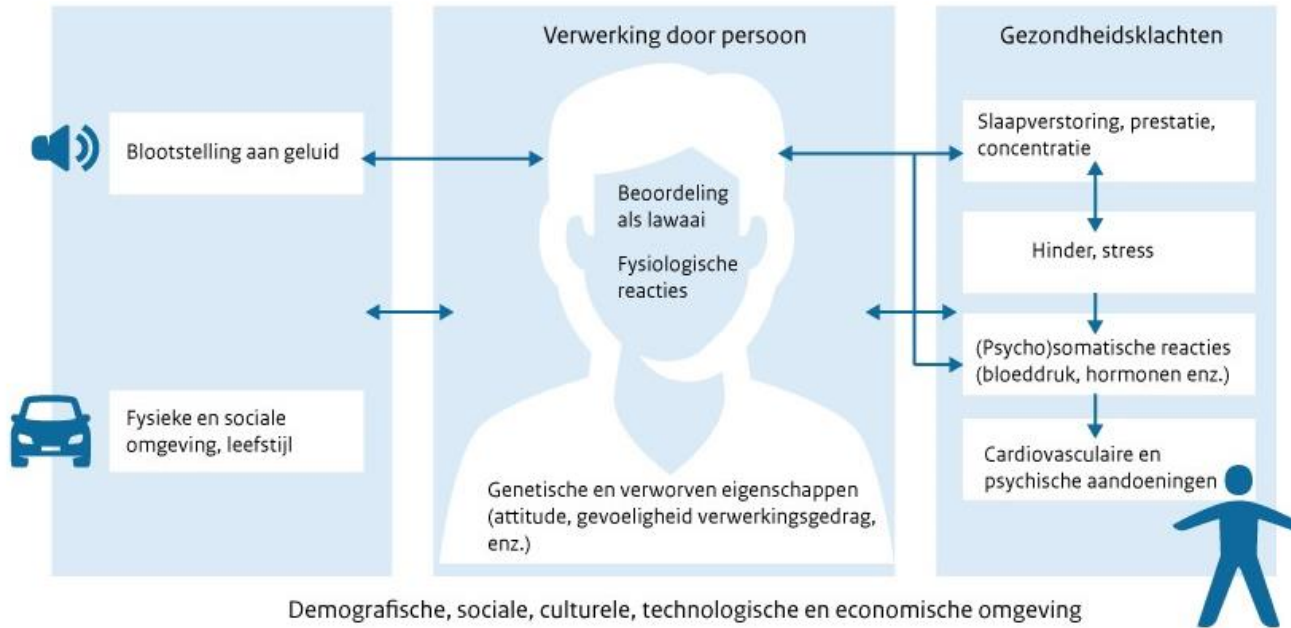
Bron: Gezondheidsraad, 1999; bewerkt door het RIVM

Research questions

- How many residents in the building experience noise annoyance caused by the construction activities at the end facades?
  - during different phases/activities
  - What aspects of the renovation particularly cause annoyance

- To what noise levels are residents exposed during the renovation of the end facades of the flat?
  - How does the noise travel though the building

Methods: first facade (few residents, much information)

In theory
o Measuring noise levels in different appartments
        -> via professional from housing association
o Empty reference apartment
o Annoyance + noise levels -> smiley calender 2 questions per day
o Annoyance other residents -> 1 cross per day
o Overview construction activities on façade per day

Noise level

Noise annoyance

Construction activities

Methods: first facade (few residents, much information)

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Noise level

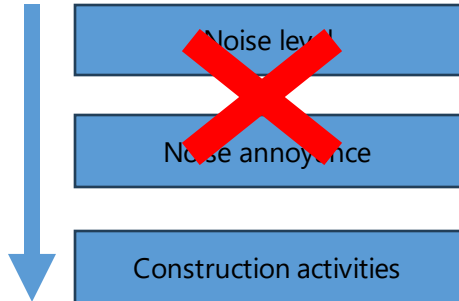| |
|---|
| Noise annoyance |

Construction activities
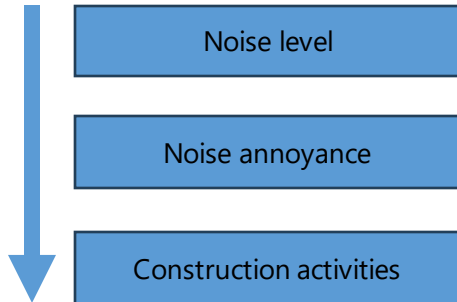
In practice
o Full memories, empty batteries, unknown location
o Empty apartment needed as crisis home
o No measurement on noisy days
o Calenders lost, thrown away or not used

Methods: second facade (more residents, less information)

New approach

o   Continuous measurement noise in two living rooms

o   Placing equipment on our own account

o   Simpler annoyance calender -> 1 cross per day

o   Calenders spread and collected on our own account

o   Fieldnotes about talks with residents

o   Overview construction activities on facade per day

Onderzoek: geluidsoverlast door de renovatie

Deel 1

Wilt u aan het einde van elke dag invullen hoeveel last u heeft gehad van het bouwgeluid en van andere geluiden die dag?

Huisnummer 255

Dag donderdag
Datum 8-4-2021

Hoeveel last had u vandaag van het bouwgeluid?
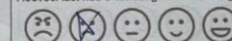
Hoeveel last had u vandaag van andere geluiden? Bijvoorbeeld langsrijdende scooters of auto's, buren of andere mensen?
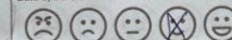
Toelichting:
rustig dagje

Dag vrijdag
Datum 9 april

Hoeveel last had u vandaag van het bouwgeluid?

Hoeveel last had u vandaag van andere geluiden? Bijvoorbeeld langsrijdende scooters of auto's, buren of andere mensen?

Toelichting:

Onderzoek: geluidsoverlast door renovatie

Deel 2

Op welke dagen had u veel last van het bouwgeluid? U kunt dit aan die dag op de kalender in te kleuren.
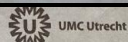
Huisnummer 131

Mei 2021

Maandag	Dinsdag	Woensdag	Donderdag	Vrijdag
3	4	5	6	7
10	11	12	13	14
17	18	19	20	21
24	25	26	27	28
31				

Juni2021

Maandag	Dinsdag	Woensdag	Donderdag	Vrijdag
	1	2	3	4
7	8	9	10	11
14	15	16	17	18
21	22	23	24	25
28	29	30		

Toelichting
Hoe hoger het getal,
0 = geen last, 5 = heel veel

Versie 2.1 30-4-2021

Universiteit Utrecht   UMC Utrecht

Onderzoek: geluidsoverlast door renovatie

Deel 2

Op welke dagen had u veel last van het bouwgeluid? U kun die dag op de kalender in te kleuren.
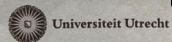
Huisnummer 41

Mei 2021

Maandag	Dinsdag	Woensdag	Donderdag	Vrijdag
3	4	5	6	
10	11	12	13	
17	18	19	20	
24	25	26	27	
31				

Juni2021

Maandag	Dinsdag	Woensdag	Donderdag	Vrijdag
	1	2	3	
7	8	9	10	
14	15	16	17	
21	22	23	24	
28	29	30		

Toelichting

Versie 2.0 30-4-2021

Universiteit Utrecht

Onderzoek: geluidsoverlast door de renovatie

Deel 2

Op welke dagen had u veel last van het bouwgeluid? U kunt dit aan die dag op de kalender in te kleuren.
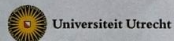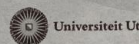
Huisnummer 39

Mei 2021

Maandag	Dinsdag	Woensdag	Donderdag	Vrijdag
3	4	5	6	7
10	11	12	13	14
17	18	19	20	21
24	25	26	27	28
31				

Juni2021

Maandag	Dinsdag	Woensdag	Donderdag	Vrijdag
	1	2	3	4
7	8	9	10	11
14	15	16		18
21	22	23	24	25
28	29	30		

Toelichting

Versie 2.0 30-4-2021   Universiteit Utrecht   UMC Utrecht

March

Ma	Di	Woe	Do	Vrij	Za	Zon
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15:1/5	16:1/5	17:2/6	18:2/5	19: 4/5	20	21
22:2/5	23: 3/5	24: 4/6	25: 4/6	26	27	28
29:1/6	30:1/6	31:1/6				

May

Ma	Di	Woe	Do	Vrij	Za	Zon
					1	2
3:1/7	4	5	6:2/7	7: 3/7	8	9
10:1/6	11:2/6	12:2/6	13:1/6	14:1/6	15	16
17:1/6	18:2/6	19: 4/6	20:1/6	21:2/6	22	23
24	25:2/6	26:1/6	27:1/6	28:2/6	29	30
31:1/6						

April

Ma	Di	Woe	Do	Vrij	Za	Zon
			1:1/5	2	3	4
5: 1/4	6: 2/4	7:2/4	8: 3/4	9: 3/4	10	11
12:1/4	13:2/4	14:2/4	15	16:1/4	17	18
19:2/4	20	21	22:1/4	23:2/4	24:2/4	25:1/4
26:2/4	27:1/4	28: 3/4	29:2/4	30:1/4		

June

Ma	Di	Woe	Do	Vrij	Za	Zon
	1:2/6	2	3	4	5	6
7:1/6	8:1/6	9:1/6	10:1/6	11:1/6	12	13
14:2/6	15:2/6	16:2/6	17: 4/6	18:2/6	19	20
21:1/6	22:2/6	23:1/6	24:2/6	25:1/6	26	27
28:2/6	29:1/6	30:1/6				

Interpretation of quantitative results

DATE: 07-MAY-2021
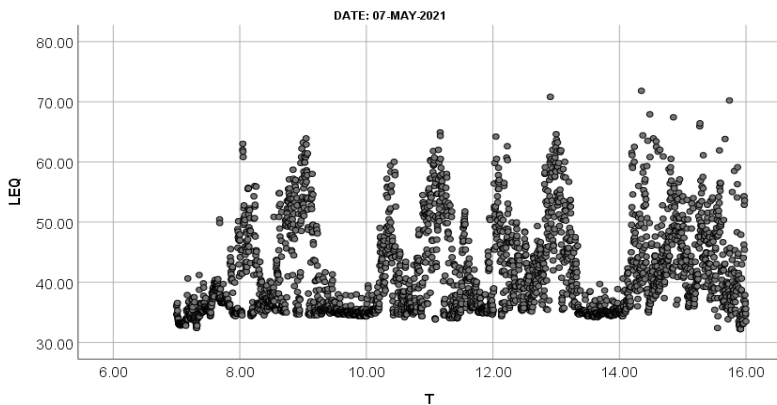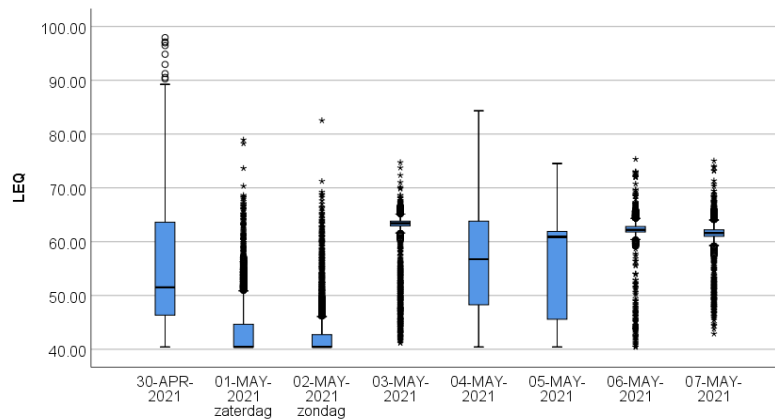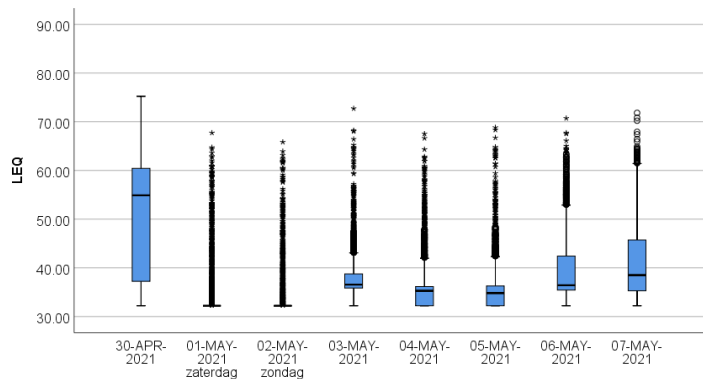
Bouwbesluit

- Average during the day
- 7 until 19 h
- Max 80 dB(A), < 60 dB(A) no limit
- measured on outdoor facade
- dB(A) vs dB(C)

Focus group annoyance

- Looking forward to renewed apartment

- Sources:
  - Drilling in concrete
  - Rolling stock
  - Shouting construction workers
  - Falling window panes

- Annoying aspects:
  - Sudden start, vebration
  - Early in morging or during the night
  - Unneccessary noise

Context construction noise

- Smell of exhaust gas

- Dust

- Changing planning

- Moving furniture

- No compensation

- Feeling of unsafety

- Not feeling at home

- Limited parking space

Health and wellbeing

- Continuous noise

- Day and night

- Finding peace at home

- Tiredness

- Angry, irritated, grumpy

- Distrubed in daily activities

- Behavior: leaving the house or drowning out noise

- Sharing stories

Interpretation of quantitative data with professionals

Housing corporation:

"I find it quite interesting to see that **you can clearly see the coffee breaks** during the work."

"If I am ever at a project home for a meeting and they are working there, I really think after half an hour, I'm so glad I can leave because **the noise is driving me crazy**."

Contractor:

"With the first end facade, it was **quite challenging to find the technique** to remove that facade. Using sawing and drilling with the second facade made it much better. Here you see the differences between the facades when you look at the number of red squares."

"If you can **pinpoint exactly what those peakes are**, perhaps you can do more. You could cluster these activities."

Interpretation of qualitative data with professionals

Housing corporation:

"It is also interesting that it is everything together. And that is it very difficult for people to distinguish, if they are bothered only by the noise, while **it's actually the entire package**."

Contractor:

"Every person is different, people can have a bad day at work, or they had a fight, then they are more sensitive to certain situations. But in principle, **we can't do much about that**."

"Look, they drop the window panes because **they're not supposed to lift too much, physically**. […] That's why they place the panes on the stand and let it fall in the container. The annoyance because of this noise is something we don't really consider."

Action perspective

Housing corporation:

"There is a possibility in **the Program of Requirements** we provide to the builder. After that, we are less in control, than the builder has to work based on theis Program of Requirements. Noise annoyance can be part of these requirements."

Contractor:

"Two things: **communication and behavior**, that are easy approaches"

Meanwhile in Utrecht Overvecht...

- Informing residents about what activities can cause noise annoyance
- proposing the community center as a place to go
- Informing per strang via WhatsApp when and at what time the activities will start
- Clustering facade and interior work and extending the use of guest appartments

-> Research data as a reason for conversation

Many thanks to

Universiteit Utrecht

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Carlijn Kamphuis

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Ward Knijnenburg

Roel Vermeulen

Anke Huss

Lutzen Portengen

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Floor Borlee

Umc utrecht

Marielle Jambroes

Yvonne Vendrig

Stella Martens

RIVM

Ric van Poll

Henri den Hollander

Portaal

Danny Mooren
Merlijn Meeus

BAM

Ali Abu Raqaba
Chester Spapens

ASSOCIATIONS BETWEEN NEARBY NATURE AND HUMAN HEALTH

#PHC23

Sjerp de Vries

WUR

Associations between nearby nature and human health

EWUU/i4PH Preserving Health, break-out session, 07/12/2023

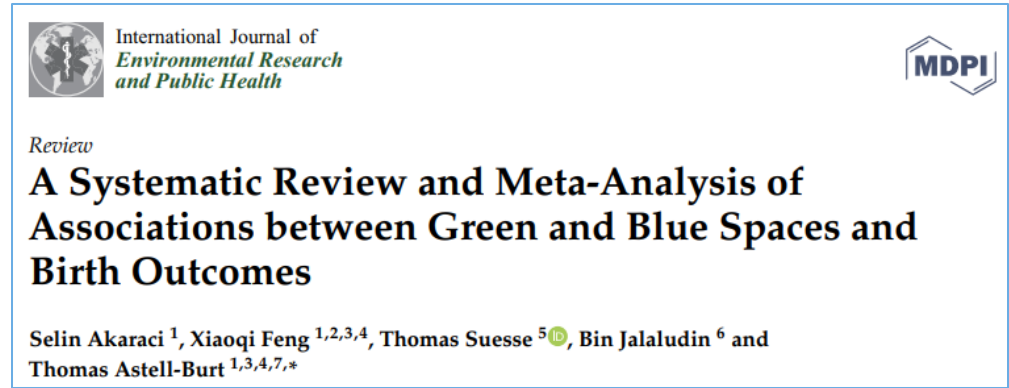Sjerp de Vries, Wageningen Environmental Research

Topics

- Associations between (nearby) nature and human health

  - and potential mechanisms by which they come about

- The importance of nearness

  - and incidental contacts with nature

- Differences in access to nature and its importance

  - especially socioeconomically

Association between nearby nature and health 1

- Already starts at birth:

International Journal of
*Environmental Research
and Public Health*

MDPI

Review

A Systematic Review and Meta-Analysis of Associations between Green and Blue Spaces and Birth Outcomes

Selin Akaraci [1], Xiaoqi Feng [1,2,3,4], Thomas Suesse [5], Bin Jalaludin [6] and Thomas Astell-Burt [1,3,4,7,*]
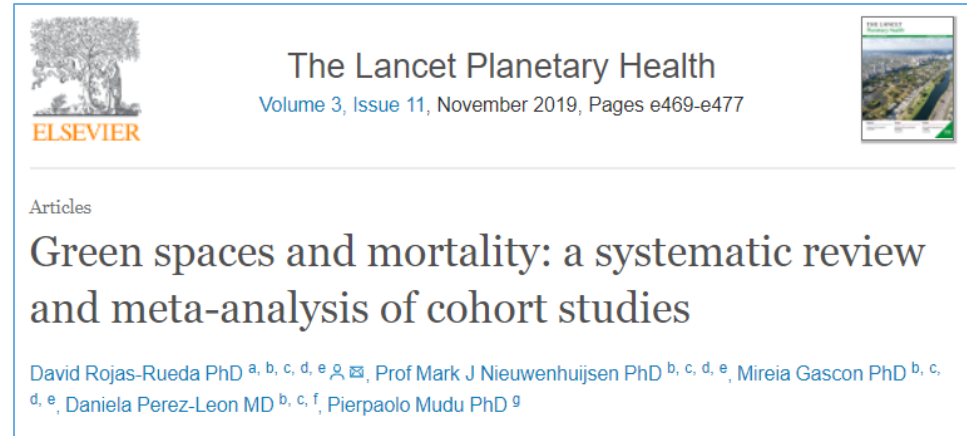
- Systematic review by Akaraci et al. (2020):

  - Greener residential surroundings of mother are associated with higher birth weight of babies

  - And lower probability of baby being small for gestational age

Association between nearby nature and health 2

- And continues till death:

The Lancet Planetary Health
Volume 3, Issue 11, November 2019, Pages e469-e477

Articles

Green spaces and mortality: a systematic review and meta-analysis of cohort studies

David Rojas-Rueda PhD [a, b, c, d, e], Prof Mark J Nieuwenhuijsen PhD [b, c, d, e], Mireia Gascon PhD [b, c, d, e], Daniela Perez-Leon MD [b, c, f], Pierpaolo Mudu PhD [g]

- Systematic review by Rojas-Rueda (2019):

  - In a greener residential environments is the risk of premature death smaller

Associations between nearby nature and health 3

And between birth and death beneficial associations for, among others:

- Social-emotional development of children (Vanaken & Danckaerts, 2018)

- Being overweight by children (Fyfe-Johnson et al., 2021)

- Being overweight by adults (Luo et al., 2020)

- Diabetes (De la Fuente et al., 2020)

- Mental health and well-being (Li et al., 2021)

- Cardiovascular disorders (Yuan et al., 2021)

The issue of causality of observed associations

- Thus, nearby nature is beneficially associated with many health outcomes.

- But are the observed associations causal in nature, with nearby nature being the driving force?
  - will greening residential environments help?

- Excluding alternative explanations/possibility of reversed causality
  - A poor health status might lead people to move to a less green (more urban) residential environment

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Potential pathways requiring nearness/contact

- Reducing heat stress, esp. needed in cities

- Reducing chronic stress, improving mood

- Facilitating social contacts and social cohesion

- Providing microbes that improve immune system functioning

- Inviting physical activity

- Providing phytoncides that activate the immune system

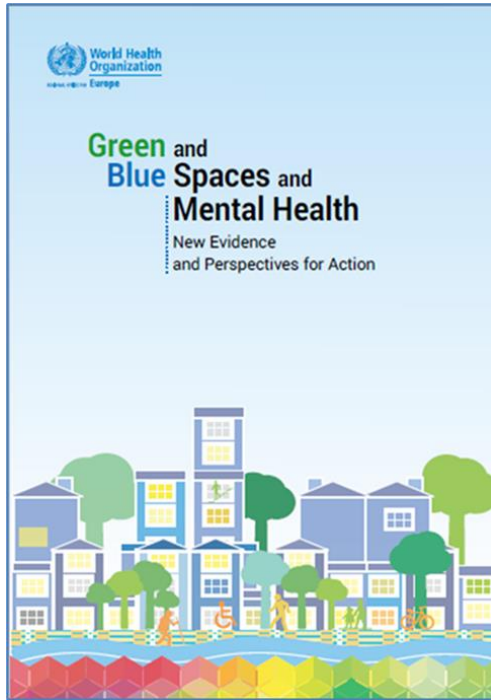- Improving air quality, esp. with regard to fine dust

Purposeful visits vs. casual encounters

Types of green and blue space and mental health

- Systematic evidence mapping by Expert Working Group

World Health Organization Europe

Green and **Blue Spaces** and **Mental Health**
New Evidence and Perspectives for Action

PEOPLE AND NATURE

BRITISH ECOLOGICAL SOCIETY

REVIEW AND SYNTHESIS | 🔓 Open Access | ©️ ①

How do different types and characteristics of green space impact mental health? A scoping review

F. Beute, M. R. Marselle ✉, A. Olszewska-Guizzo, M. B. Andreucci, A. Lammel, Z. G. Davies, J. Glanville, H. Keune, L. O'Brien, R. Remmen, A. Russo, S. de Vries

First published: 07 September 2023 | https://doi.org/10.1002/pan3.10529

WAGENINGEN
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Importance of **nearness** during COVID-19

Reducing socioeconomic health disparities

Large socioeconomic health disparities, even in the rather egalitarian Netherlands:

- 7 years shorter life expectancy

- 15 years shorter healthy life expectancy

A low socioeconomic status (SES) is associated with poorer access:

- less often access to private green space (domestic garden)

- lower amount of nearby (semi-)public green space per capita

WAGENINGEN
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Can breaking the link between SES and access to green space help to reduce socioeconomic health disparities?
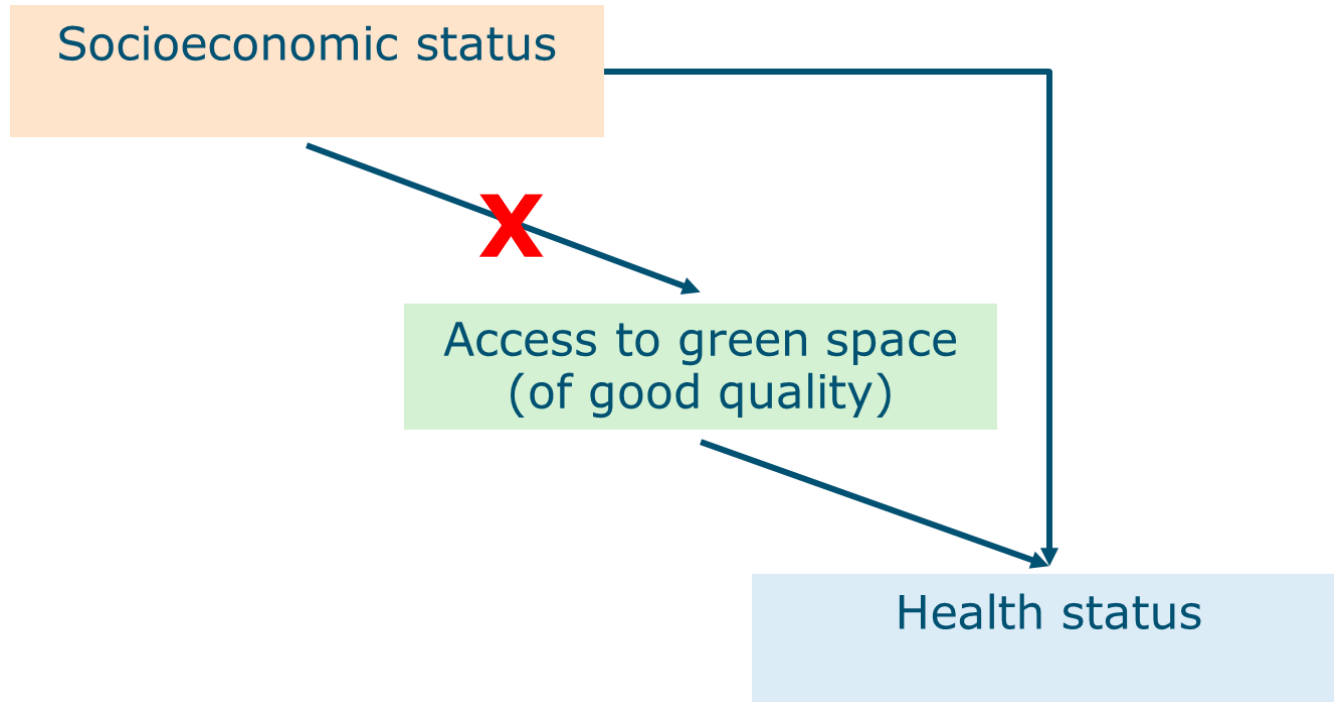
Nearby nature more important for low SES

Systematic review (Rigolon et al., 2021)

International Journal of
**Environmental Research
and Public Health**

MDPI

Review

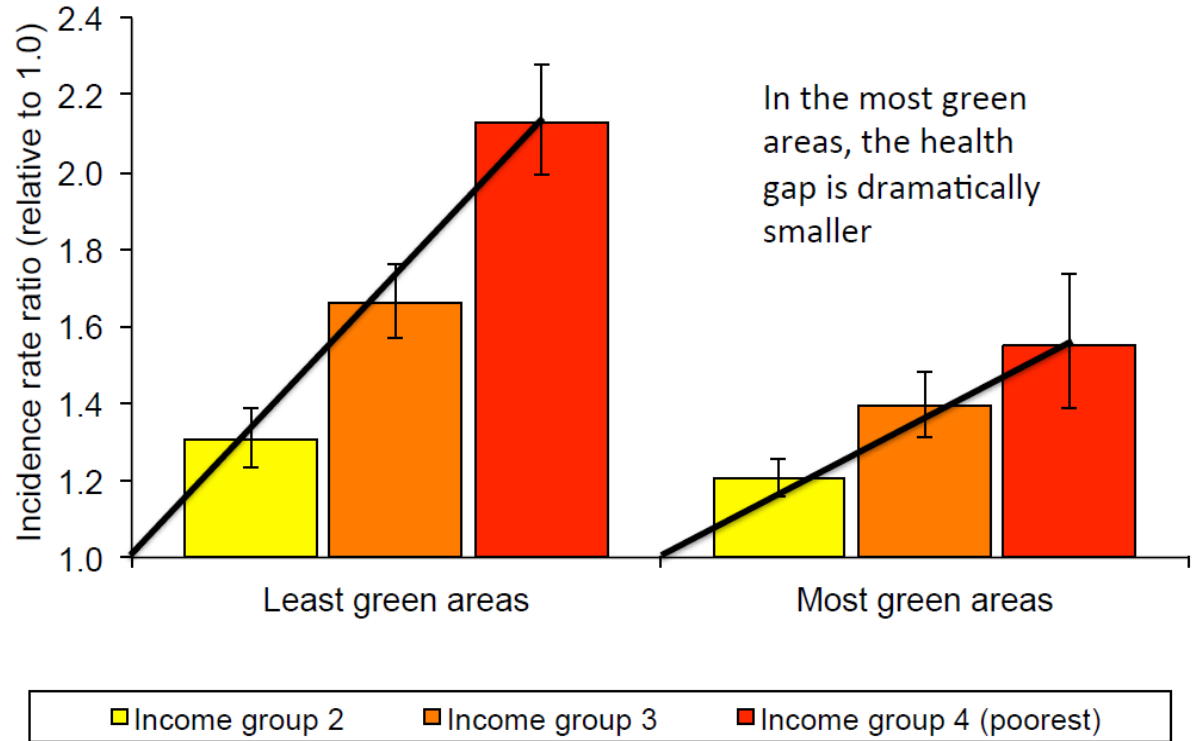## Green Space and Health Equity: A Systematic Review on the Potential of Green Space to Reduce Health Disparities

Alessandro Rigolon [1,*], Matthew H. E. M. Browning [2], Olivia McAnirlin [2] and Hyunseo (Violet) Yoon [3]

- Conclusion: the beneficial association between residential green space and health is stronger among poorer segments of the population
  - Especially so when it comes to public green space
  - This phenomenon in stronger in Europe than in North America

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Conclusions

- Nearby nature is beneficially associated with many health outcomes

- The pathway is not always clear, but there are several plausible candidates
  - such as heat stress, mental stress, social cohesion

- Which type of nature works best is not very clear, but nearness is important
  - amount of exposure likely to be more important than high quality exposure (however defined)

- Providing low SES neighbourhoods with green space of at least reasonable quality may help to reduce socioeconomic health disparities

Thanks for your attention!

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healthywi8

EMPOWERING HEALTHY LIFESTYLE BEHAVIOUR THROUGH PERSONALISED INTERVENTION PORTFOLIOS TO PREVENT AND CONTROL OBESITY DURING VULNERABLE STAGES OF LIFE.

Suzan Evers

Astrid Kemperman

Built Environment

Pieter Van Gorp

Industrial Engineering and Innovation Sciences

TU/e

Eindhoven university of technology

About the Project

➔Aims to enhance the effectiveness of existing and future initiatives and investments in obesity prevention throughout Europe

A consortium of 24 public and private partners from nine European countries

Budget: 10.000.000€
Start/End: 1 May 2023 - 30 April 2028
Coordinator: Luxembourg Institute of Health

Participants

Background

- **Worldwide obesity: x 3 since 1975**
- **60% of adults and nearly one in three children are overweight and/or obese**
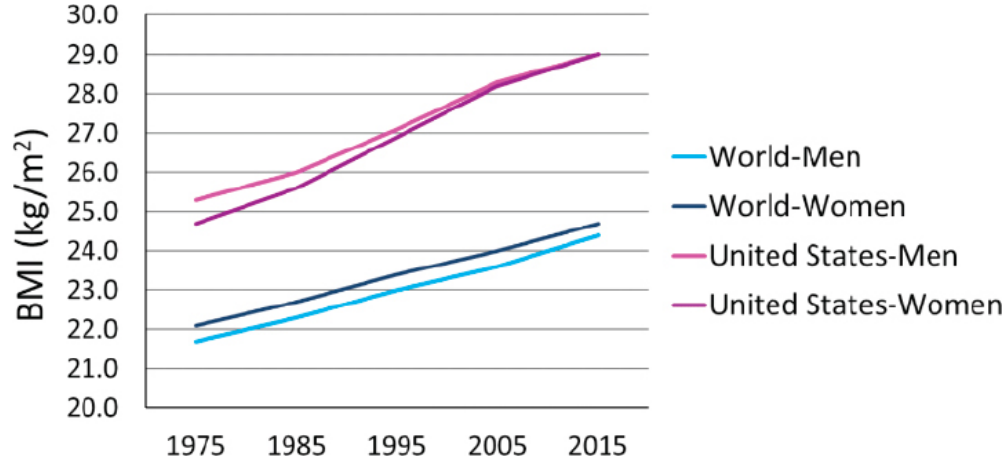
SOURCES: NCD-RisC, 2017. Presented by Lindsay Jaacks, October 9, 2018.
https://doi.org/10.17226/25273.

overweight BMI >= 25; obesity BMI >=30

Especially:

Vulnerable populations

Consequences of obesity

➜ **significantly increases the risk of noncommunicable diseases**

➜ **responsible for up to 8% of healthcare costs**
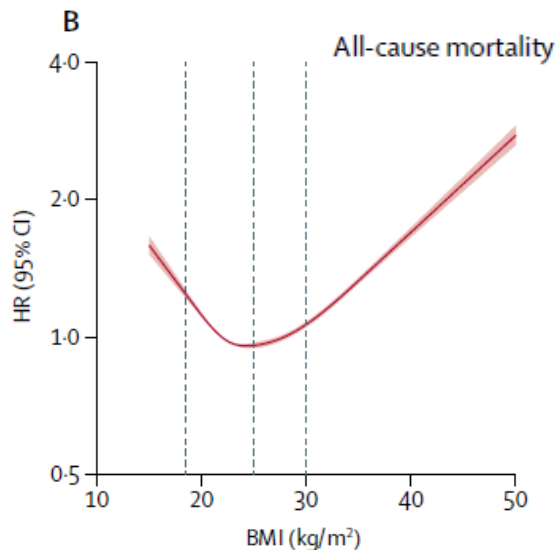
Shortened life-expectance

Where Obesity Places The Biggest Burden On Healthcare
Average annual health expenditure per capita due to obesity from 2020-2050*
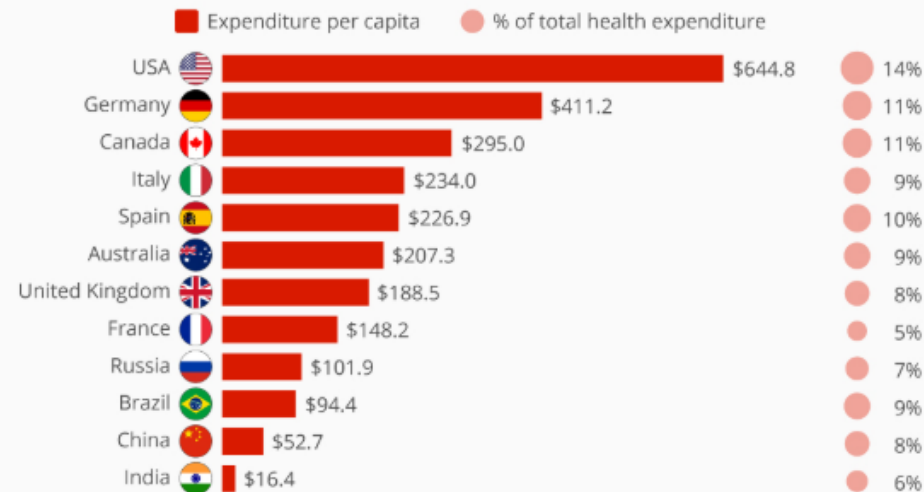
What causes obesity and overweight?

→ an energy imbalance between calories consumed and calories expended

• an increased intake of energy-dense foods that are high in fat and sugars

• an increase in physical inactivity due to the increasingly sedentary nature of many forms of work, changing modes of transportation, and increasing urbanization

→ Obesity is preventable

World Health Organization

However,

➔Lifestyle changes, such as balanced and healthier food intake, increase in PA, and decrease in SB are difficult for people

➔mHealth apps and tools supporting long-term weight loss have been little successful and their outcomes are not consistent or supported by scientific evidence

➔Moreover, most studies using these tools,
- conduct short-term tests
- do not take into account the intervention context
- ignore the emotional and psychological states
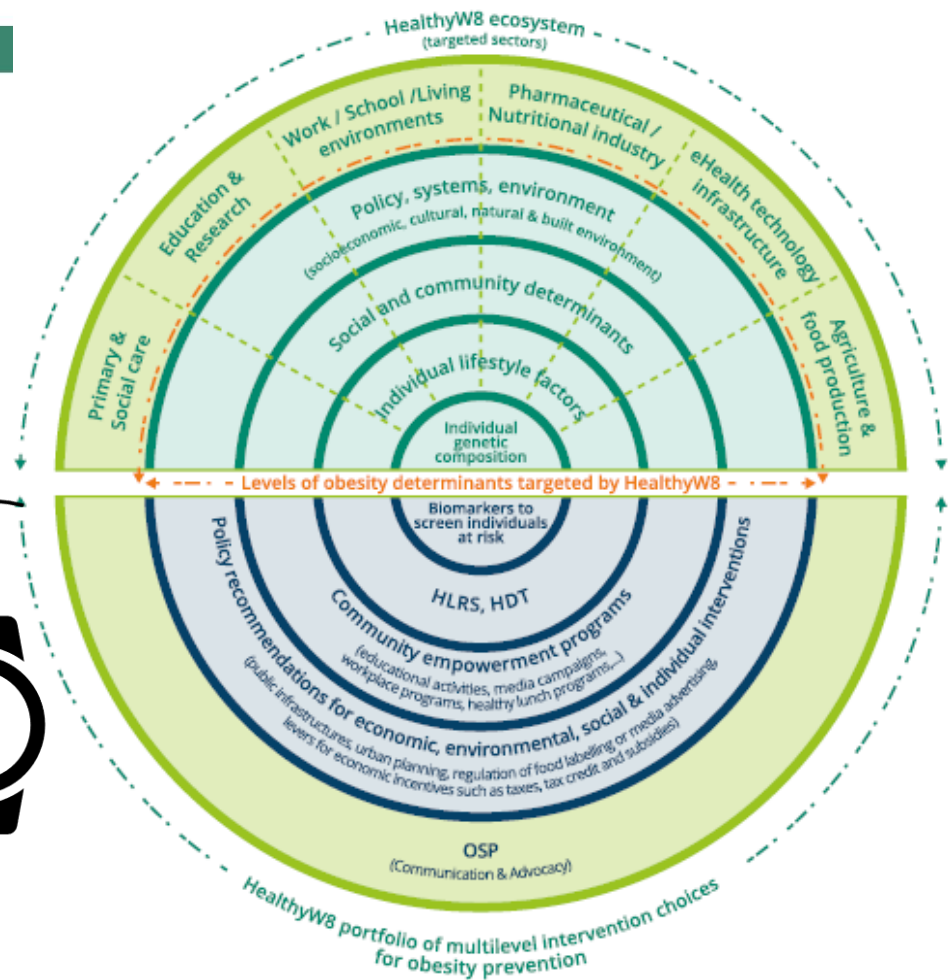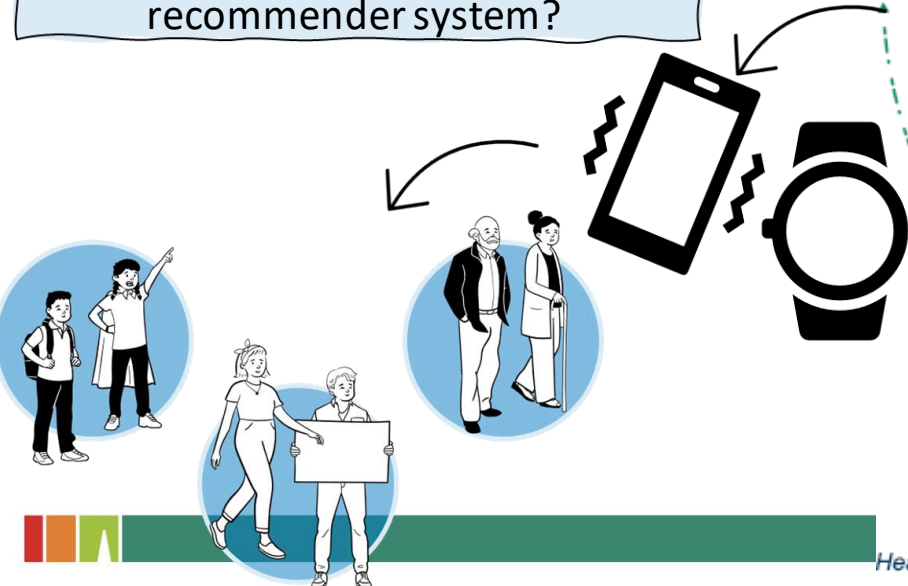
HealthyW8
Multilevel intervention

How can we empower healthy lifestyle behavior through personalized intervention portfolios using a healthy lifestyle recommender system?

HealthyW8 ecosystem
(targeted sectors)

Work / School /Living environments

Pharmaceutical / Nutritional industry

eHealth technology infrastructure

Education & Research

Policy, systems, environment
(socioeconomic, cultural, natural & built environment)

Social and community determinants

Individual lifestyle factors

Primary & Social care

Agriculture & food production

Individual genetic composition

Levels of obesity determinants targeted by HealthyW8

Biomarkers to screen individuals at risk

HLRS, HDT

Policy recommendations for economic, environmental, social & individual interventions
(public infrastructures, urban planning, regulation of food labelling or media advertising, levers for economic incentives such as taxes, tax credit and subsidies)

Community empowerment programs
(educational activities, media campaigns, workplace programs, healthy lunch programs...)

OSP
(Communication & Advocacy)

HealthyW8 portfolio of multilevel intervention choices for obesity prevention

HealthyW8 multilevel portfolio approach to obesity prevention

Progress beyond the state of the art

1. Novel bio-marker assessment, based on promising preliminary findings (e.g. microRNA, proteomics), which will be confirmed in the trials

2. Multi-component eHealth interventions overcoming previous obstacles: suitable interventions for persons with overweight/obesity, focusing on meal planning rather than time-consuming food logging, low PA intensity, and reducing sedentary behavior (SB)

3. Integrating personal mood/psychological aspects that have been typically neglected when developing eHealth solutions for obesity prevention

4. Combining nudging/gamification features and supporting the HLRS with a HDT for enhanced behavior forecasting

Healthy Lifestyle Recommender Solution (HLRS)

Nutrida (NIUM): personalized meal recommender plan based on age, gender, PA, dietary restrictions, culinary/ cultural personal preferences & local dishes, budget…

Gamebus (TU/e): a prototyping and health data management platform facilitating research on engagement effects of design decisions in mHealth platforms, including a restricted front-end for smartwatches – Experiencer (emotional states)

Work-plan HealthyW8
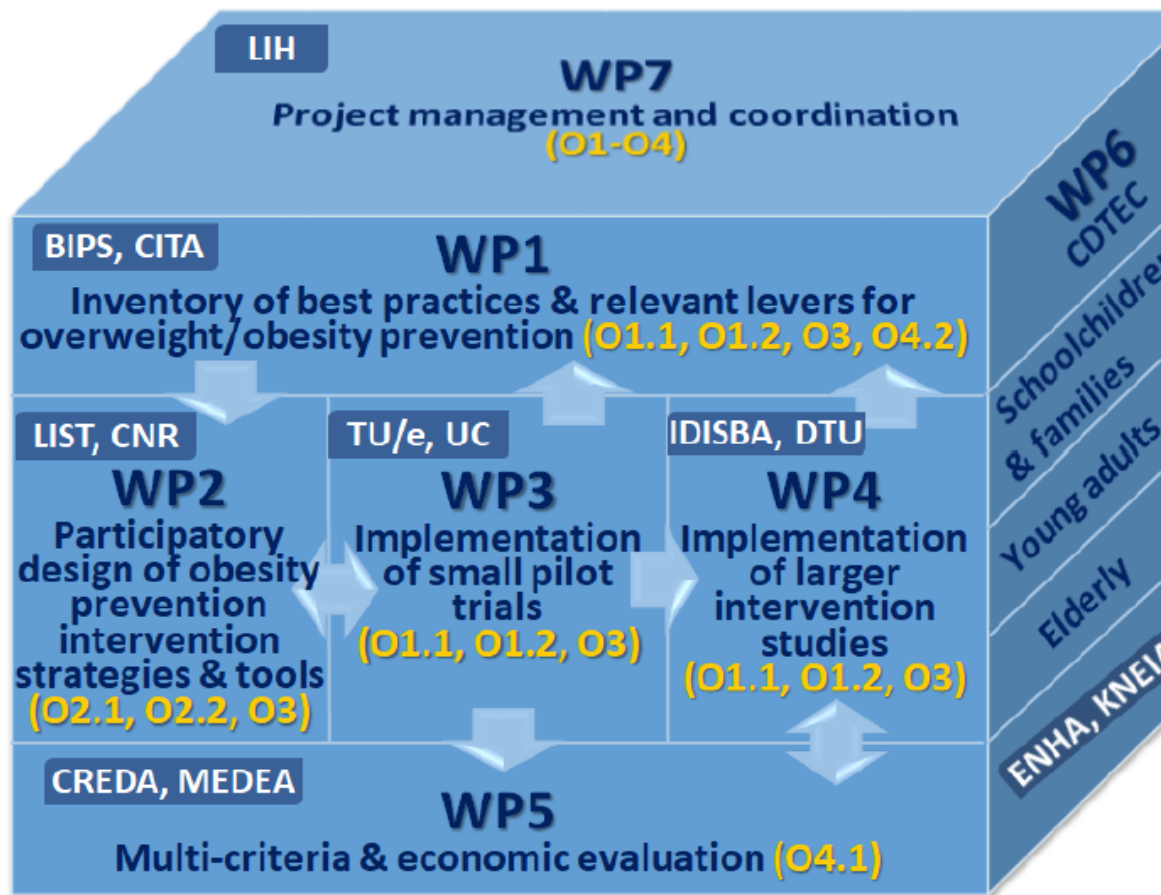
Research in NL- Feb-Dec 2024
Pilot Trials

- Validate and test a diverse set of obesity prevention intervention strategies, behavior change techniques, and tools

- among different end-user groups, within different contexts

- to evaluate the impact of the tools, interventions (alone or in combination) on participants' technology use and acceptance, and engagement levels

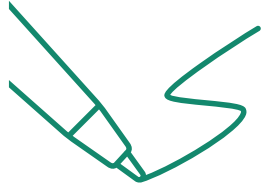- PA, healthy eating and emotional state

Children

Young adults

Older adults

Interactive session

Please write down your idea on the front of the given piece of paper & indicate your background of expertise on the back

Which **intervention/strategy** would you suggest to implement in mHealth applications to improve the effectiveness of health behavior change to stimulate users toward healthy lifestyles?

Interactive session
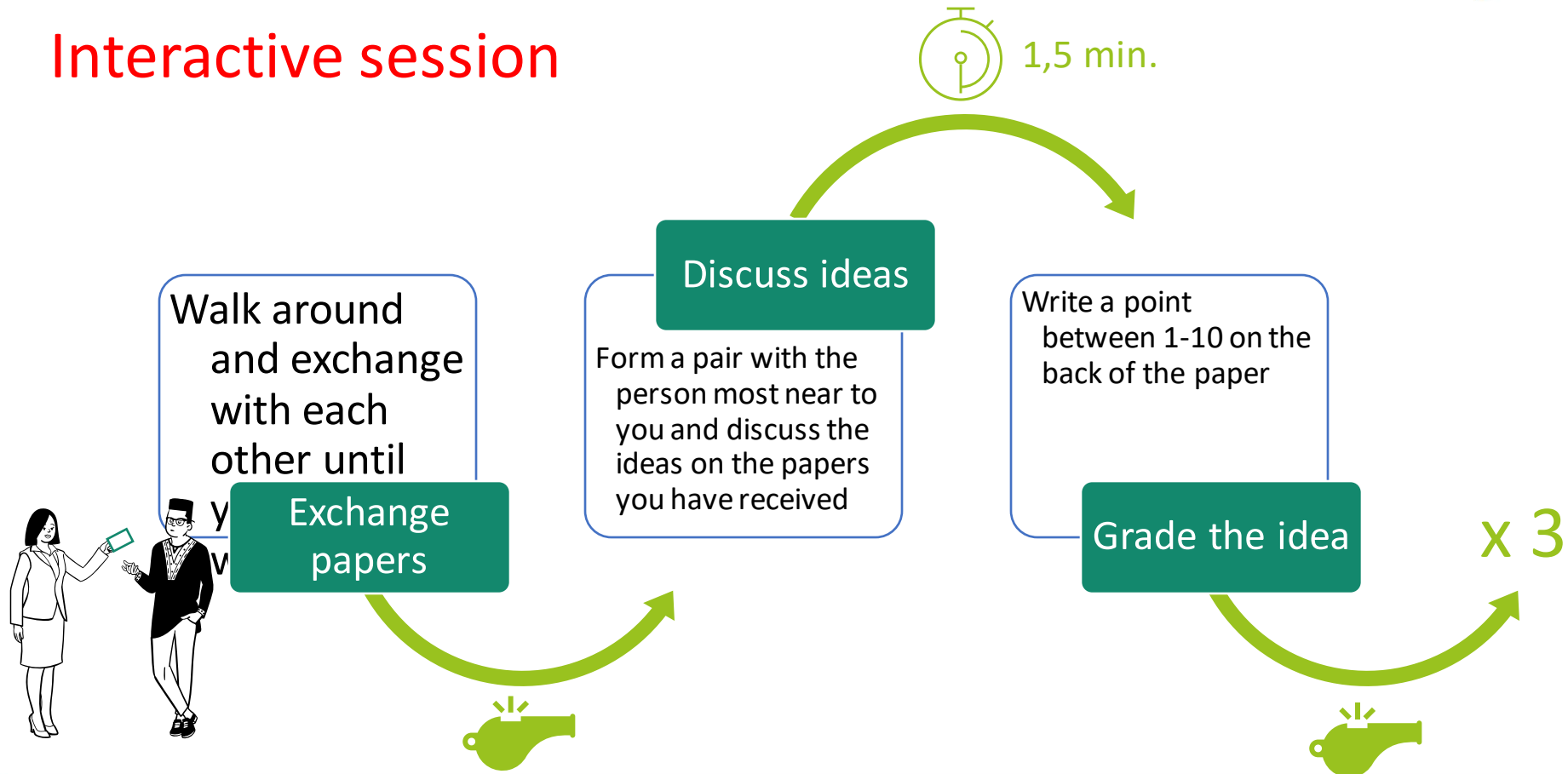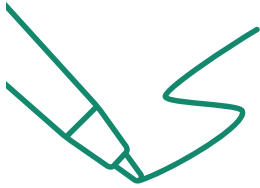
Please write down the total number of points the idea you have in hand has gathered

What is the top 3 of ideas?

Which idea(s) has/have received the maximum of points (30)?
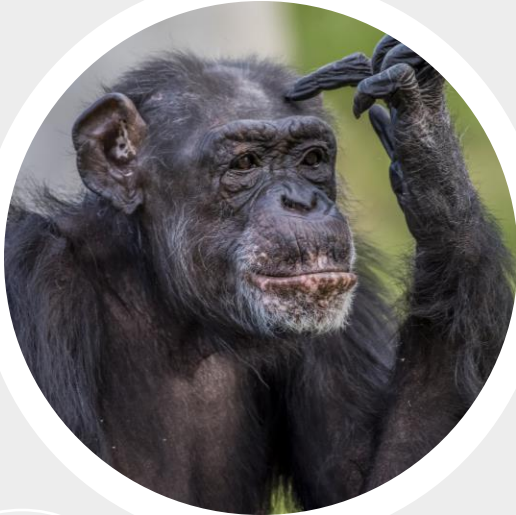
Thank you !

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KEYNOTE SESSION

14:55 – 15:45 Keynote Session
Monkey See, Monkey Do: coexistence versus cooperation in an organizational perspective

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