

PHYSICAL ACTIVITY IN THE WORK ENVIRONMENT

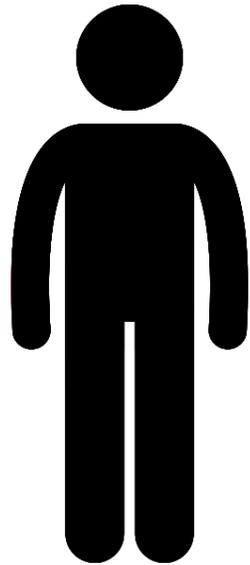
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4353560
07-07-2021

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CONTENT

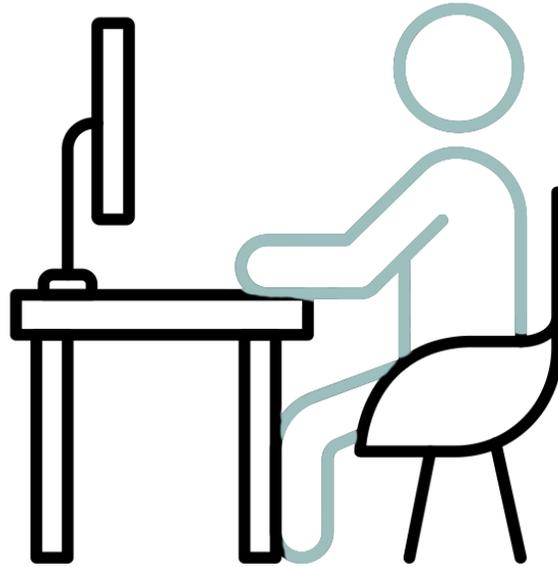
- Introduction
- Research method
- Discussion & Conclusion

INTRODUCTION

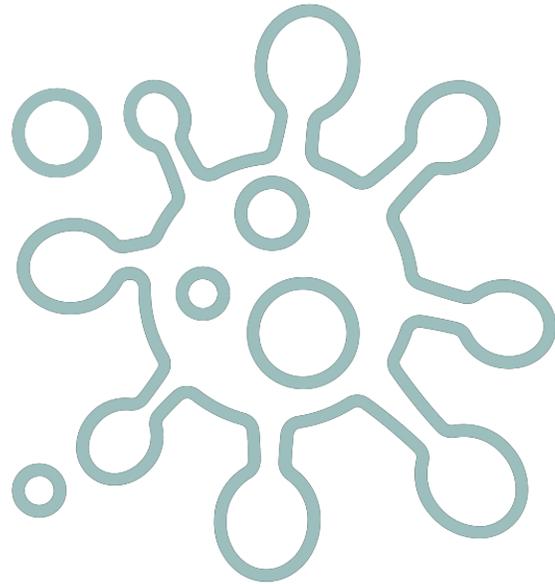


150 min

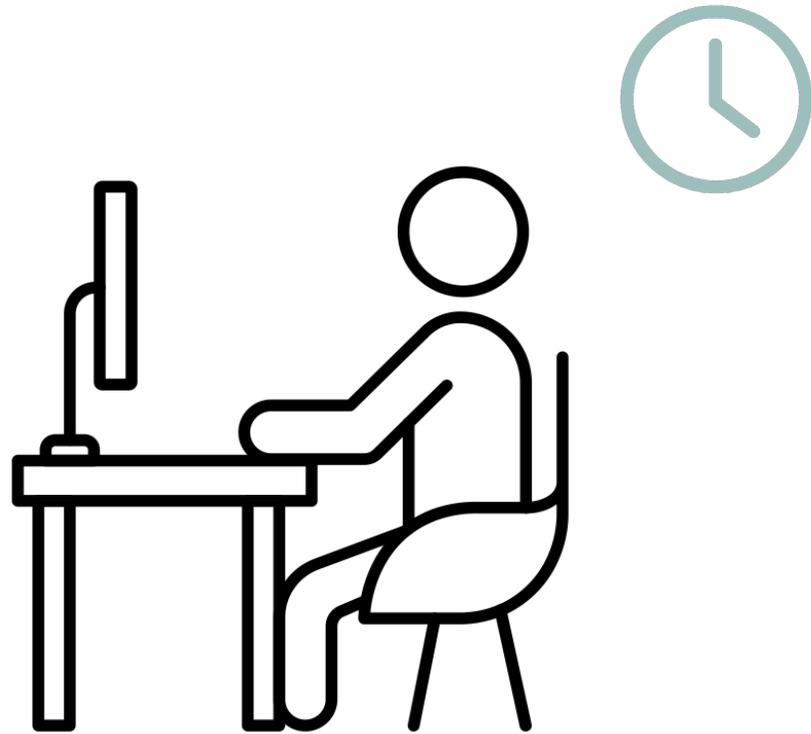
INSUFFICIENT PHYSICAL ACTIVITY



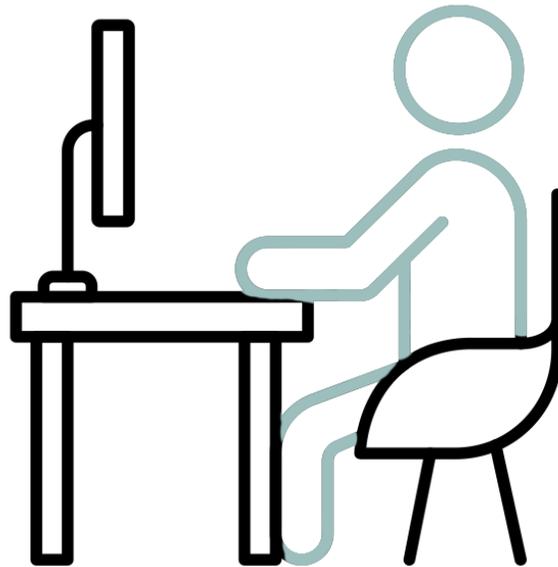
SEDENTARY BEHAVIOUR



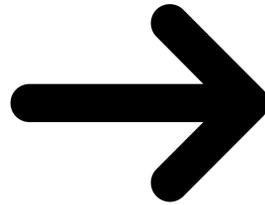
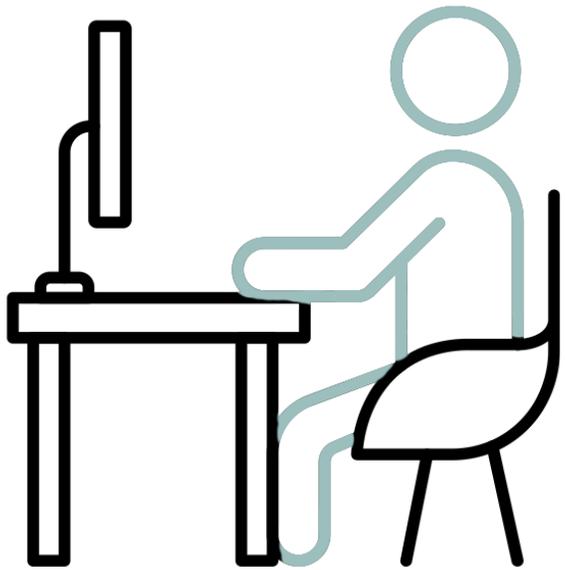
COVID-19



(HOME) WORK ENVIRONMENT



OFFICE EMPLOYEE



INCIDENTAL PHYSICAL ACTIVITY

Arrangement of spaces and its impact on walking & stair climbing



Social-ecological understanding of physical activity

OFFICE ENVIRONMENT + WALKING & STAIR CLIMBING

There is **limited research** on the **relation** between the arrangement of spaces within the office building and employees' incidental physical activity in terms of walking and stairclimbing. Besides, existing research isolates the influence of the spatial environment from the social environment. Thus, also **explanatory research** in this field is limited.

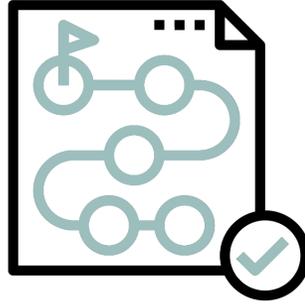
RESEARCH GAP

How can the **arrangement of spaces** within the office building and the **home work environment** stimulate office employees' incidental physical activity in terms of **walking and stair climbing**?

1 | How physically active are office employees in terms of **walking and stair climbing** in a different arrangement of spaces within the **office building** and the **home work environment**?

2 | What **spatial, social and personal factors** support and inhibit walking and stair climbing within a different arrangement of spaces within the **office building** and the **home work environment**?

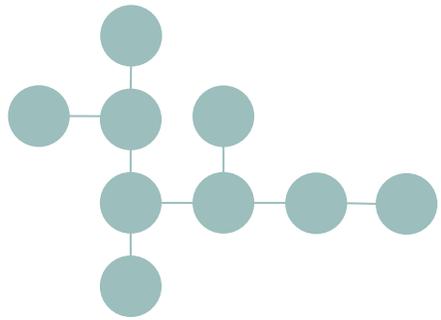
RESEARCH QUESTIONS



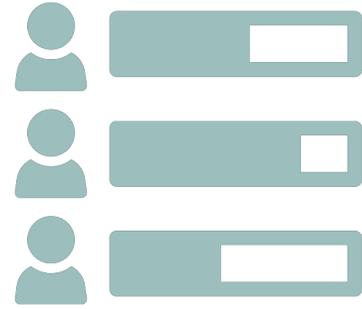
The main aim of this research is to develop an enhanced **method** to **assess physical activity in the office environment** and accordingly answer the research questions. In this study, the method is tested, refined and **retested** to advise for further use of the method.

RESEARCH AIM

RESEARCH METHOD



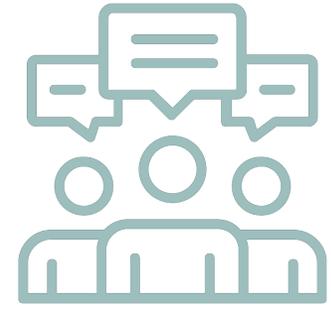
SPATIAL GRAPH



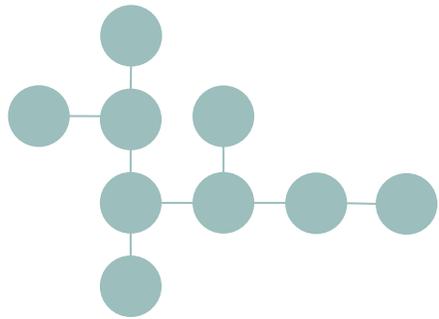
SURVEY



ACTIVITY TRACKER
& LOGBOOK

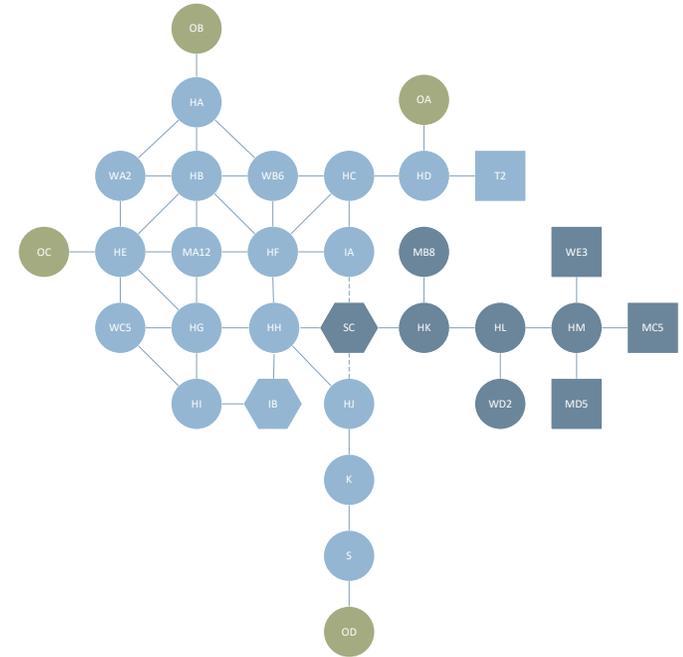
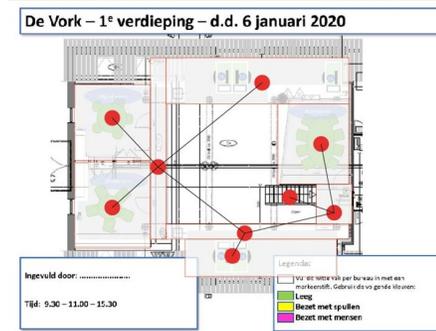
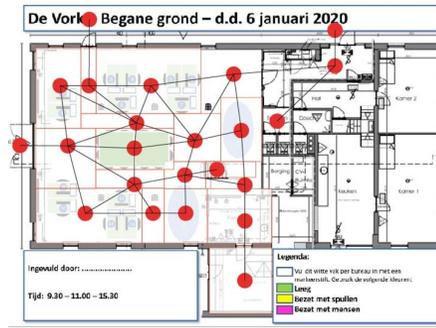
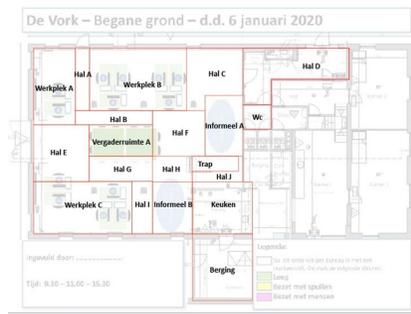
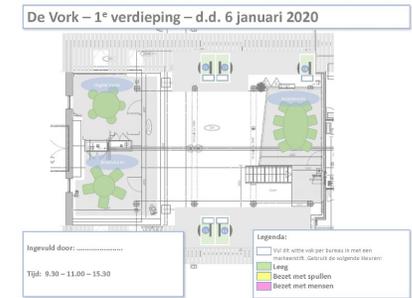
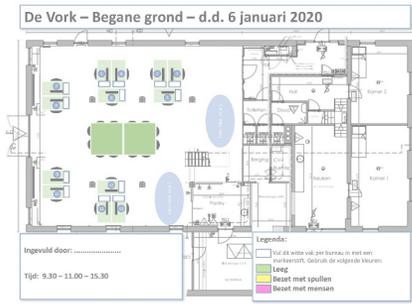


FOCUS GROUP



SPATIAL GRAPH

- Objectively measure the variables related to the arrangement of spaces by using office floor plans for spatial graphs
- The distance between and centrality of workplaces and key office destinations
- Center and periphery of the office
- Selection criteria



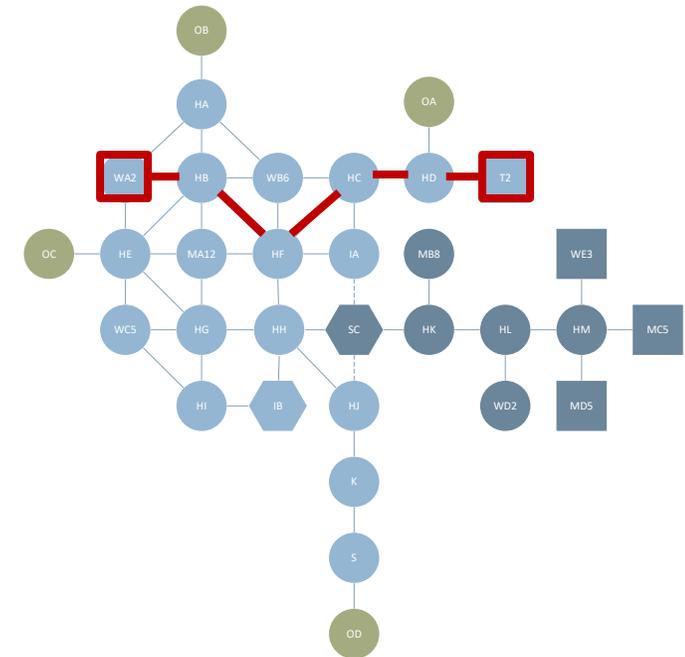
FLOOR PLAN

LOCATIONS:
NODES

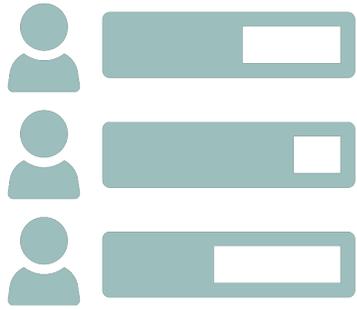
ROUTES:
LINES

SPATIAL GRAPH

Odijk																			
	Load	Degree													Eccentricity	Closeness			
		Distance																	
		Workplace A	Workplace B	Workplace C	Workplace D	Workplace E	Meeting room A	Meeting room B	Meeting room C	Meeting room D	Informal A	Informal B	Toilet	Kitchen			Storage	Staircase	
Workplace A	2	3		2	2	7	8	2	6	8	8	3	4	5	5	6	4	8	5,0
Workplace B	6	4	2		3	6	7	2	5	7	7	2	3	3	4	5	3	7	4,2
Workplace C	5	3	2	3		6	7	2	5	7	7	4	2	6	4	5	3	7	4,5
Workplace D	2	1	7	6	6		3	6	3	3	3	6	5	8	6	7	3	8	5,1
Workplace E	3	1	8	7	7	3		7	4	2	2	7	6	9	7	8	4	9	5,8
Meeting room A	12	4	2	2	2	6	7		5	7	7	2	3	4	4	5	3	7	4,2
Meeting room B	8	1	6	5	5	3	4	5		4	4	5	4	7	5	6	2	7	4,6
Meeting room C	5	1	8	7	7	3	2	7	4		2	7	6	9	7	8	4	9	5,8
Meeting room D	5	1	8	7	7	3	2	7	4	2		7	6	9	7	8	4	9	5,8
Informal A		3	3	2	4	6	7	2	5	7	7		3	3	4	5	3	7	4,4
Informal B		2	4	3	2	5	6	3	4	6	6	3		5	3	4	2	6	4,0
Toilet	2	1	5	3	6	8	9	4	7	9	9	3	5		5	6	6	9	6,1
Kitchen		2	5	4	4	6	7	4	5	7	7	4	3	5		1	3	7	4,6
Storage		2	6	5	5	7	8	5	6	8	8	5	4	6	1		4	8	5,6
Staircase		2	4	3	3	3	4	3	2	4	4	3	2	6	3	4		6	3,4



ARRANGEMENT OF SPACES



SURVEY

- Spatial, social and personal characteristics to identify factors that support and inhibit walking and stair climbing
- Personal characteristics; living situation; work situation; movement in general; self-reported activity at the office
- Selection criteria
- Informed consent form



ACTIVITY TRACKER & LOGBOOK

- Objectively measure employees' **step count** by using an activity tracker in combination with particular information from the logbook (e.g. work time and locations)
- Participants log their **stair use** and **movement patterns and reasons for movement** to identify factors that support and inhibit walking and stair climbing
- **Five consecutive days** (Monday to Friday) during commuting and working hours when working within the **home work environment** (and **office building**)
- Average office day

Maandag

Deelnemer-ID

Week van
16-11-2020

Opmerkingen

Werklocatie
Waar heeft u vandaag gewerkt voor draaijer+partners?

Kantoor in Utrecht of Groningen
Hoe laat vertrok u vandaag naar het kantoor in Utrecht of Groningen?
Hoe laat kwam u vandaag aan op het kantoor in Utrecht of Groningen?
Hoe laat vertrok u vandaag naar huis vanaf het kantoor in Utrecht of Groningen?
Hoe laat kwam u vandaag thuis vanaf het kantoor in Utrecht of Groningen?

Thuis
Hoe laat begon u vandaag thuis met werken voor draaijer+partners?
Hoe laat stopte u vandaag thuis met werken voor draaijer+partners?

uur
 uur
 uur

uur
 uur

Om	ging ik van			naar			omdat				
	Kantoor Utrecht	Kantoor Groningen	Thuis	Namelijk	Kantoor Utrecht	Kantoor Groningen	Thuis	Namelijk	Trapgebruik	Reden voor beweging	Namelijk/toelichting
...			
11:00			Living room				Kitchen		No	Getting a drink	
11:00			Kitchen				Living room		No	Planned meeting	
...			

Date	Time (minute)	Steps
...
16-11-2020	08:05	27
16-11-2020	08:23	13
...
16-11-2020	17:07	19
16-11-2020	17:43	10
...
	Total	1789

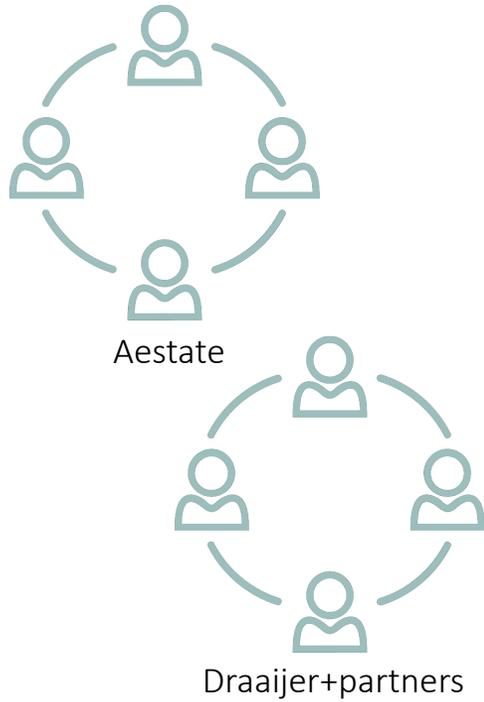
Day	Steps
16-11-2020	1789
17-11-2020	1677
18-11-2020	780
19-11-2020	Elsewhere
20-11-2020	2240
Average	1622



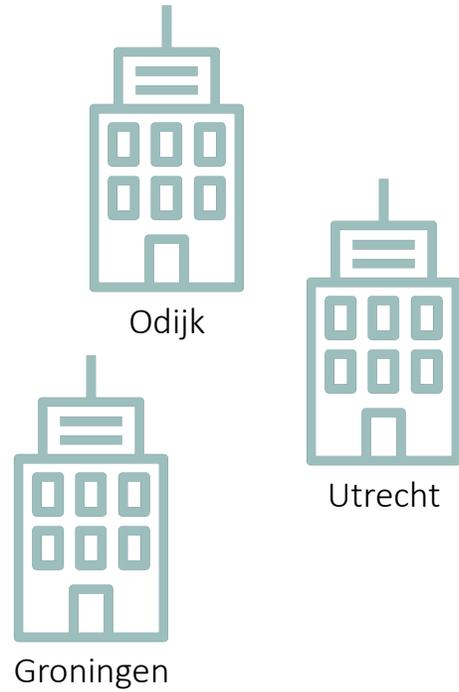
- To understand the quantitative results of previous steps and identify spatial, social and personal barriers and facilitators for walking and stair climbing within the office building and the home work environment.
- One focus group per organisation

FOCUS GROUP

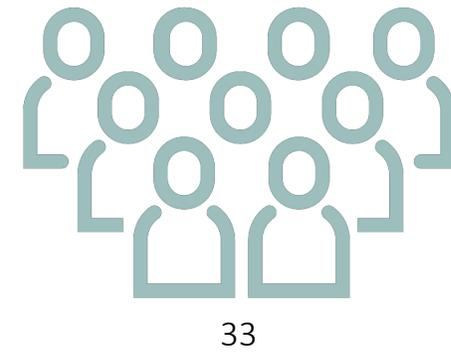
DISCUSSION AND CONCLUSION



ORGANISATIONS



OFFICE BUILDINGS

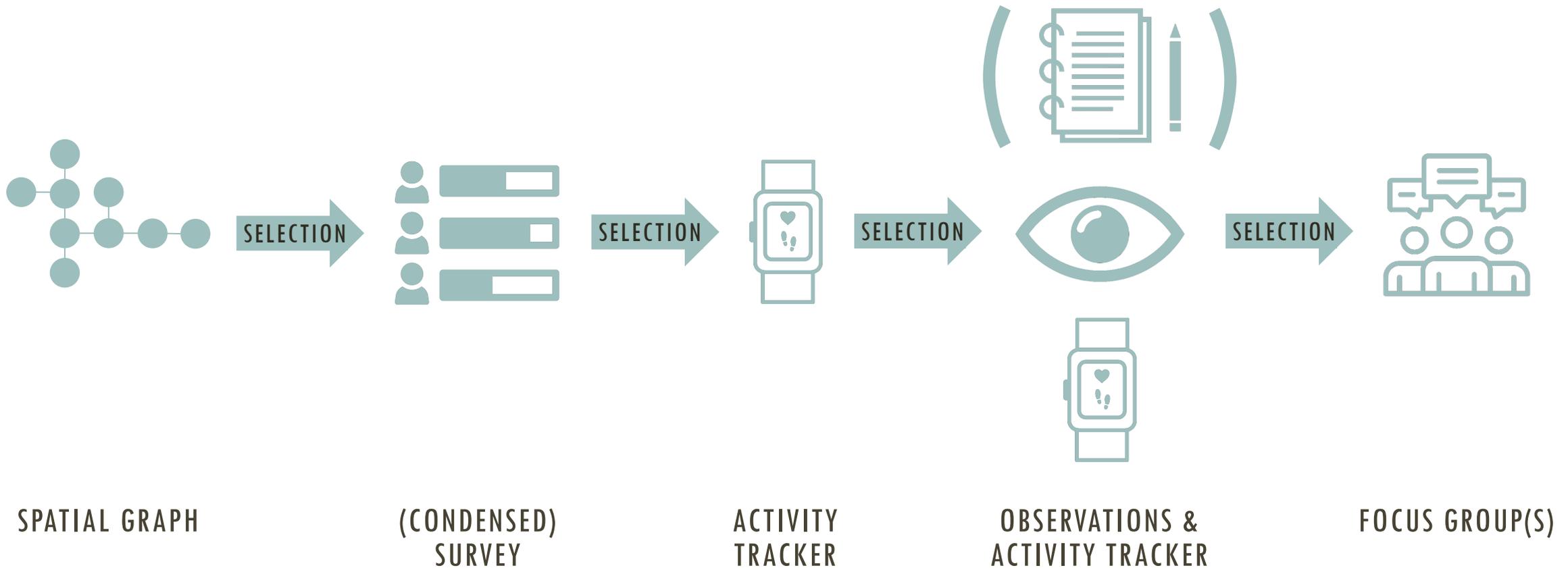


PARTICIPANTS

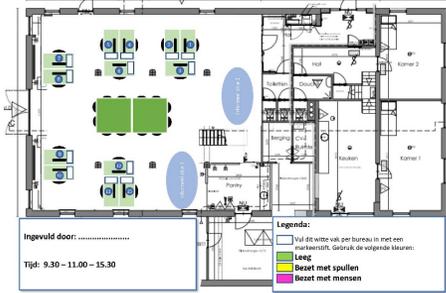
STRENGTHS

- Explanatory mixed-method research design: spatial & social environment
- Office building & home work environment
- Combined the strengths of the applied methods in previous studies and improved them
- Diversity of data (collection methods) and its possibilities for analysis
- Objective measurements of arrangement of spaces & physical activity in combination with perceived physical activity
- Quantification of movement patterns and reasons for movement and related steps

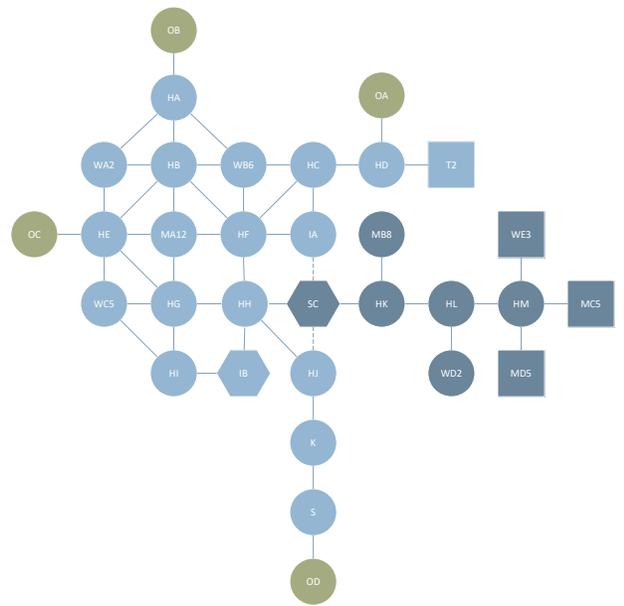
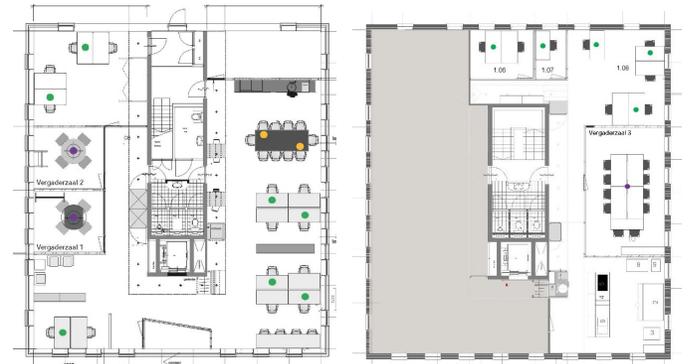
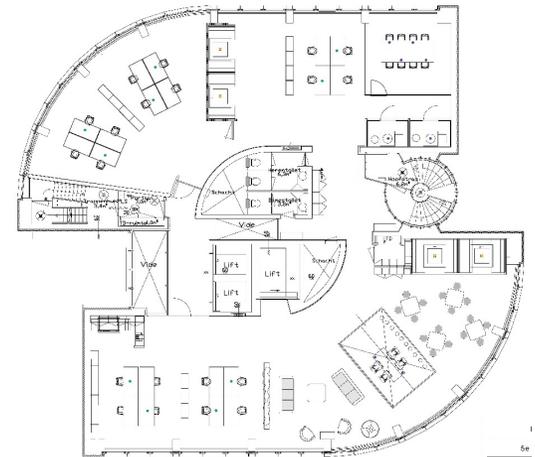
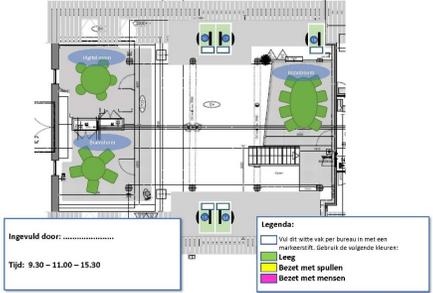
Recommendations → Limitations ↓	A more automated and valid method (e.g. sensors and/or activity tracker that tracks the route)	Measure only a <u>select</u> group of employees and/or work environment	Conduct <u>observations</u> (e.g. site audits) for (additional) information and validation of existing information	(Another) <u>activity tracker</u>	Not asking for the situation of different periods in the <u>survey</u> (<u>condensed</u>)	Determine what you need to know and what method is needed for this
Missing physical activity data & measured steps in the car				X		
Differences and non-response in self-reported physical activity				X	X	
Time-consuming for both the researcher and the participant (drop-outs)	X	X	X	X	X	X
Unable to connect some of the logbooks with the activity data	X					
Representation of reality, especially concerning the average working day	X		X			
Unknown routes	X		X			
Incomplete floor plans & difficulties to guess the activities of the zones			X			
Complicated and long survey					X	
Not all quantitative results could be discussed in the focus group			X			



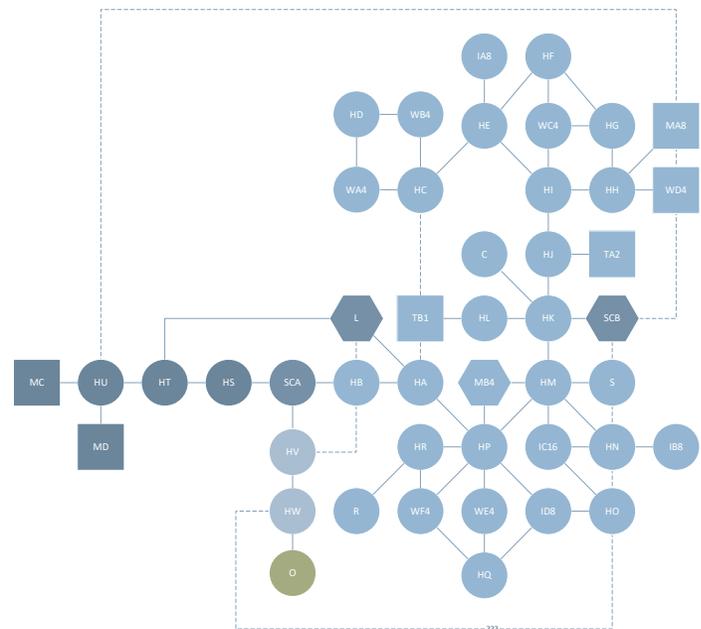
De Vork – Begane grond – d.d. 6 januari 2020



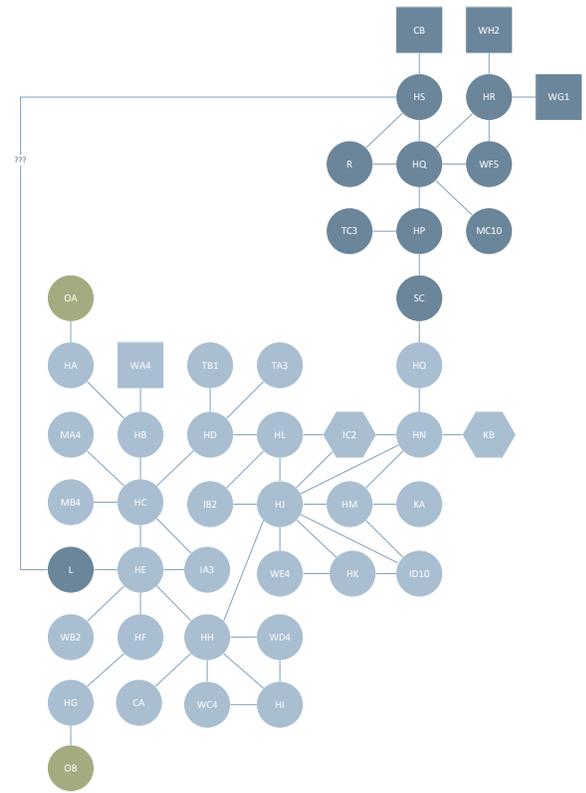
De Vork – 1^e verdieping – d.d. 6 januari 2020



ODIJK

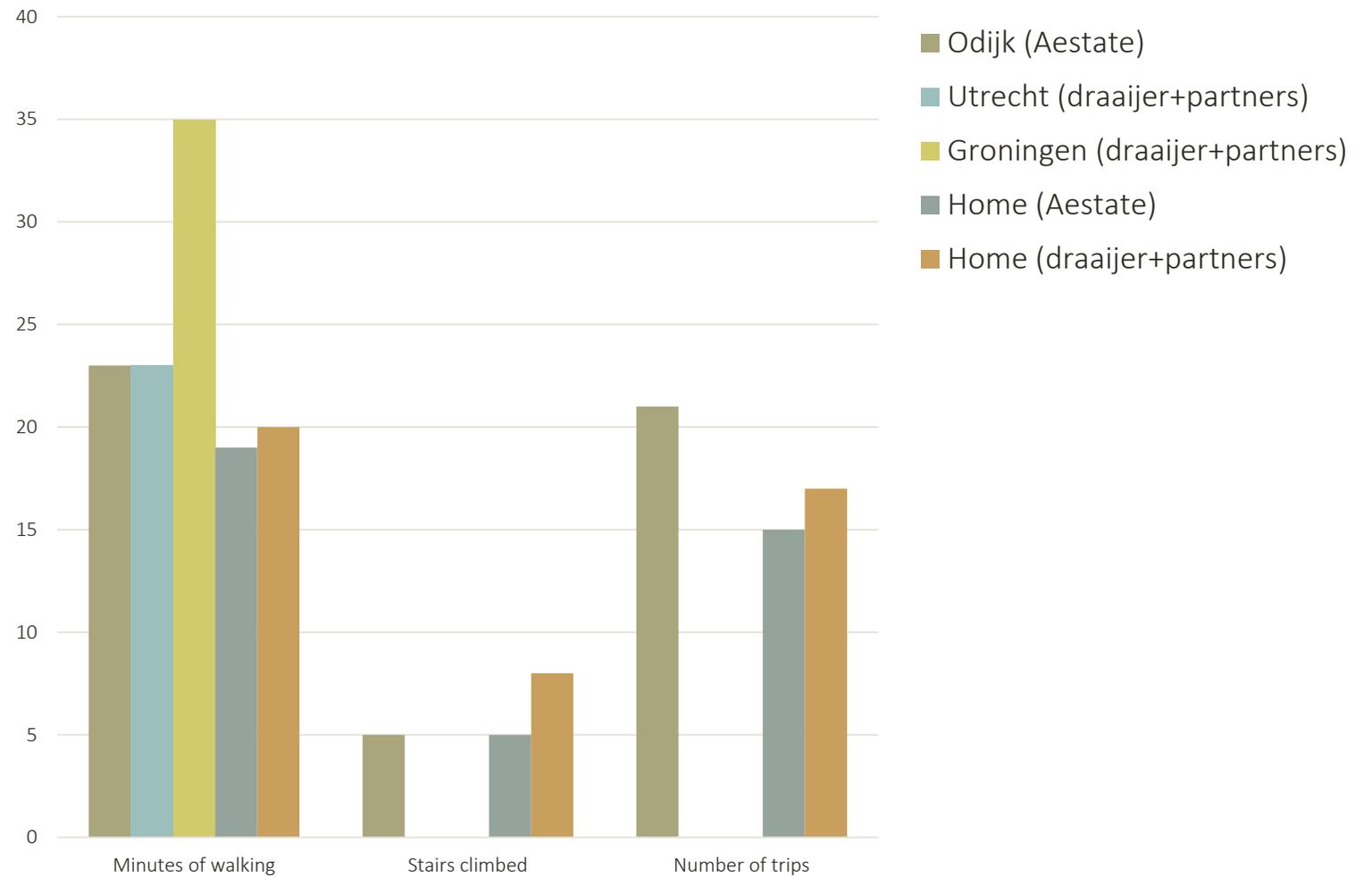


UTRECHT



GRONINGEN

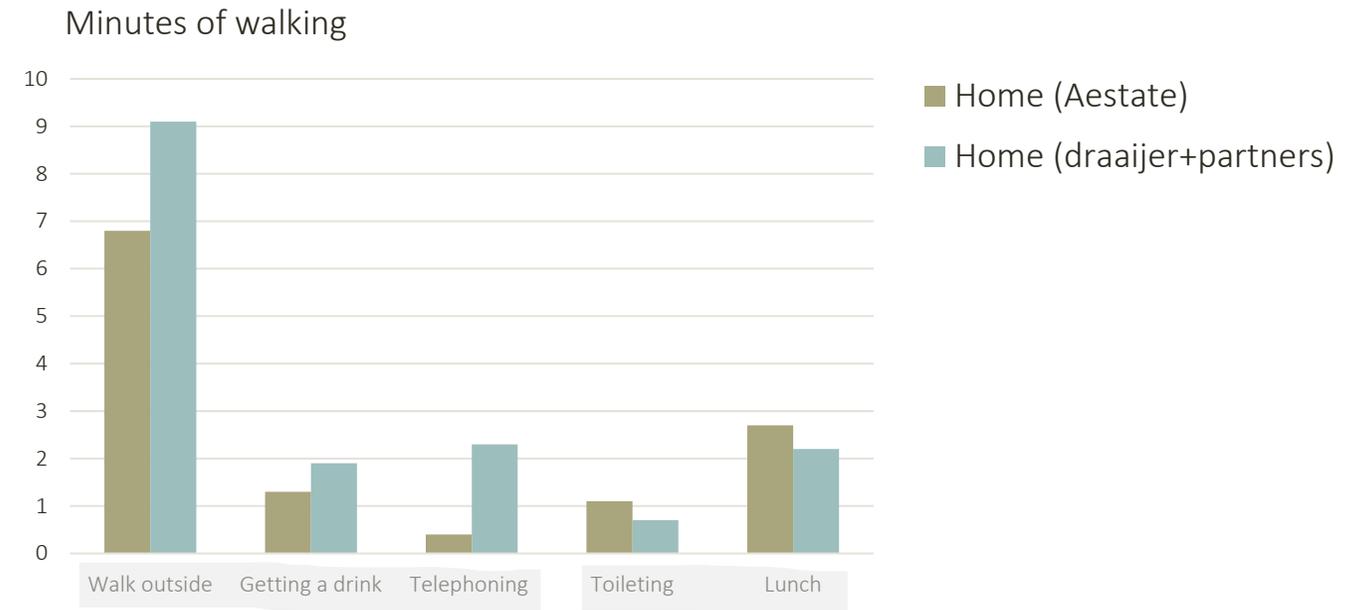
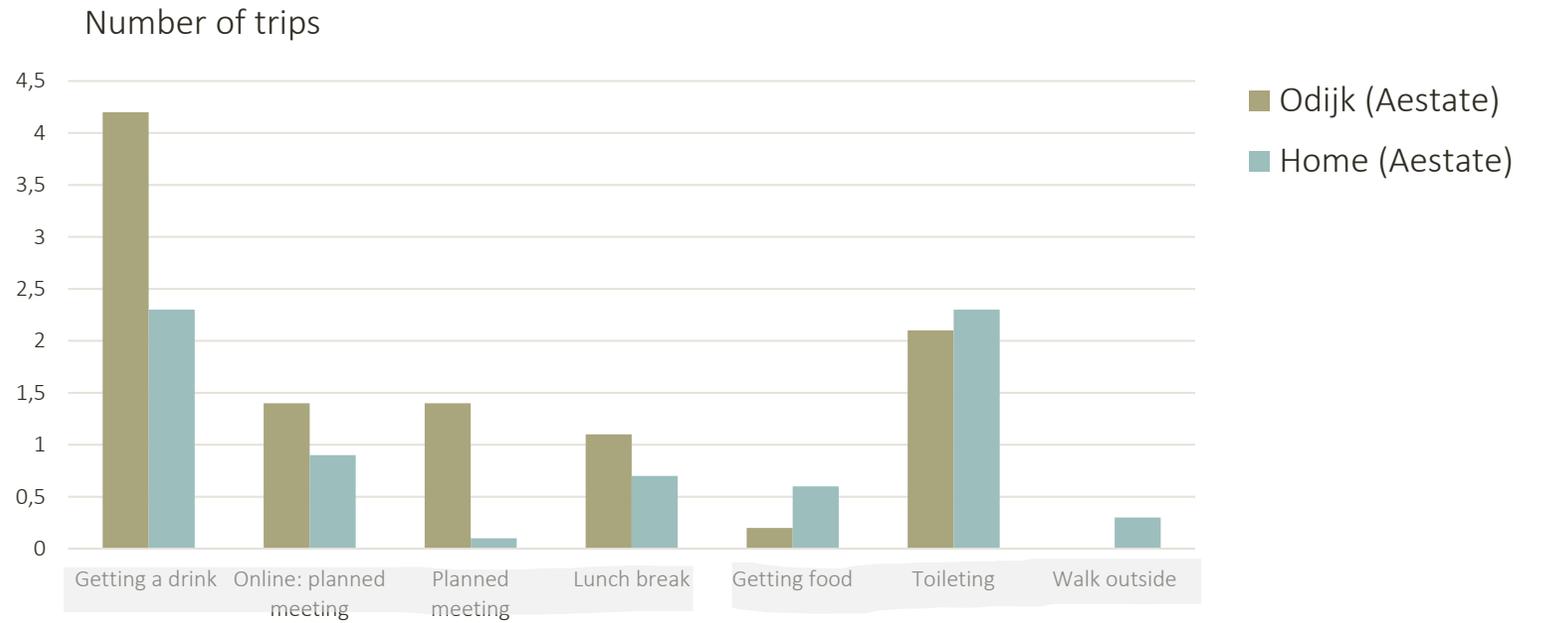
1 | How physically active are office employees in terms of walking and stair climbing in a different arrangement of spaces within the office building and the home work environment?



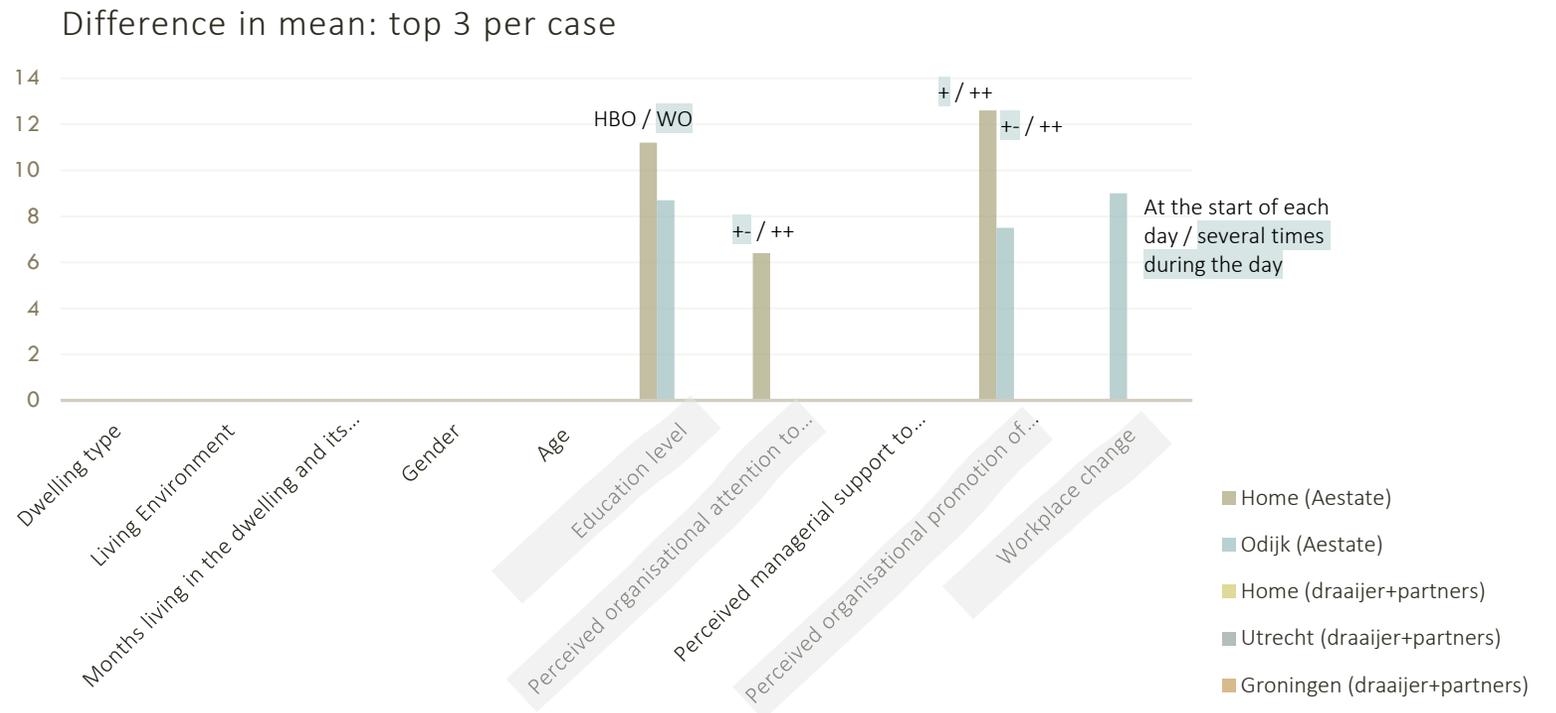
2 | What spatial, social and personal factors support and inhibit walking and stair climbing within a different arrangement of spaces within the office building and the home work environment?

- The **distances** within all the three offices are so **small** that it does not influence employees' **workplace choice** and the **number of trips**
- Workplace choice mainly derives from **non-arrangement of spaces** factors
- These reasons indirectly influence employees physical activity as the location of the workplace determines the **distance walked** to office locations assuming that the number of trips stayed the same despite the distance
- The larger the **maximum distance** in the spatial graph, the more minutes walked
- The more **workplaces in the periphery**, the more minutes walked

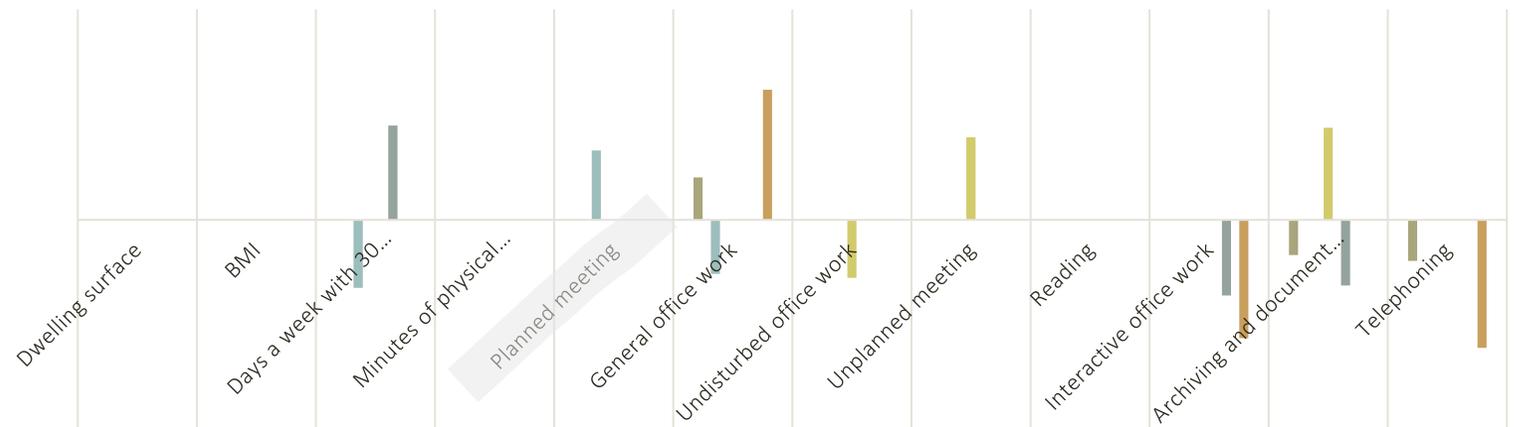
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2 | What spatial, social and personal factors support and inhibit walking and stair climbing within a different arrangement of spaces within the office building and the home work environment?



Correlation: top 3 per case



Main question | How can the arrangement of spaces within the office building and the home work environment stimulate office employees' incidental physical activity in terms of walking and stair climbing?

- The combination of the **spatial and social environment** determines the amount of physical activity
- In **offices** where the maximum distance between office locations is relatively **small**:
 - **Maximise the distance** between workplaces and key office destinations especially the ones that are used most
 - Place especially **groups of workplaces** further from key office destinations
 - Place workplaces for performing **undisturbed work** further from the group of workplaces in the periphery with a low degree
 - Make the least central workplaces and meeting rooms **most attractive**

LIMITATIONS

- Limited cases and participants - especially per subgroup
- Self-report versus objectively measured physical activity
- Physical activity within the home work environment: during the COVID-19 pandemic
- Physical activity within the office building: before the COVID-19 pandemic
- After the COVID-19 pandemic: Hybrid work environment

RECOMMENDATIONS

- More data need to be gathered by using the improved version of the method to expand the knowledge about physical activity in the work environment
- Study more diverse types of (1) offices in terms of arrangement of spaces and (2) organisations
- Hybrid work environment
- Use the method for multiple purposes
- Study sub-groups of employees in-depth

THANK YOU

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