

Research activity

Research & Exploration



1

Casual observation

To gain an overview of the selected context with all the possible



2

Desk research

To get inspired by other people's research/papers. To check what is already known about this topic and make connections between different fields



3

Survey

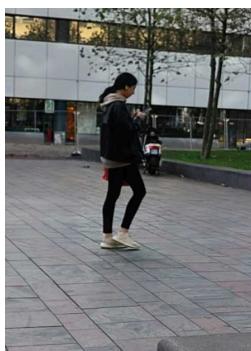
To gain insight into people's experience, need, and thought



4

Interview

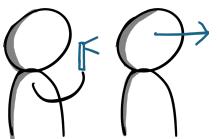
To gain some extra insight into the experience and feelings of the users in a more open and flexible way than the questionnaire



See appendix p. 53–85 for details about methods, procedure and sample size

Research activity

Research & Exploration



5

Roleplay

To compare people's typical behavior while walking with the phone and without it in a crowded environment to highlight pain points and possible intervention



6

Ethnography

To take into account the smartphone point of view



7

Sensitising activity

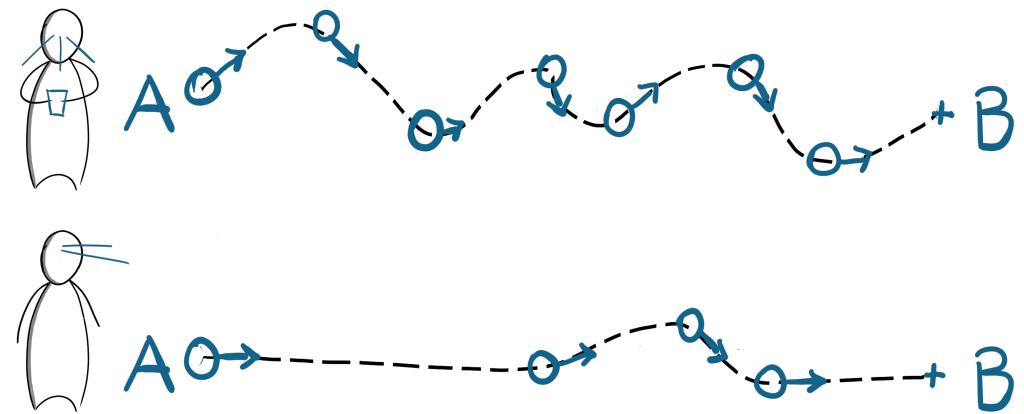
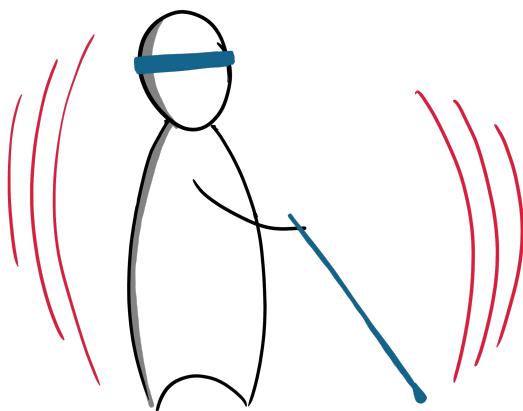
To gain some extra insight into user's needs through the generative and making technique



See appendix p. 53-85 for details about methods, procedure and sample size

Main insights

Research & Exploration

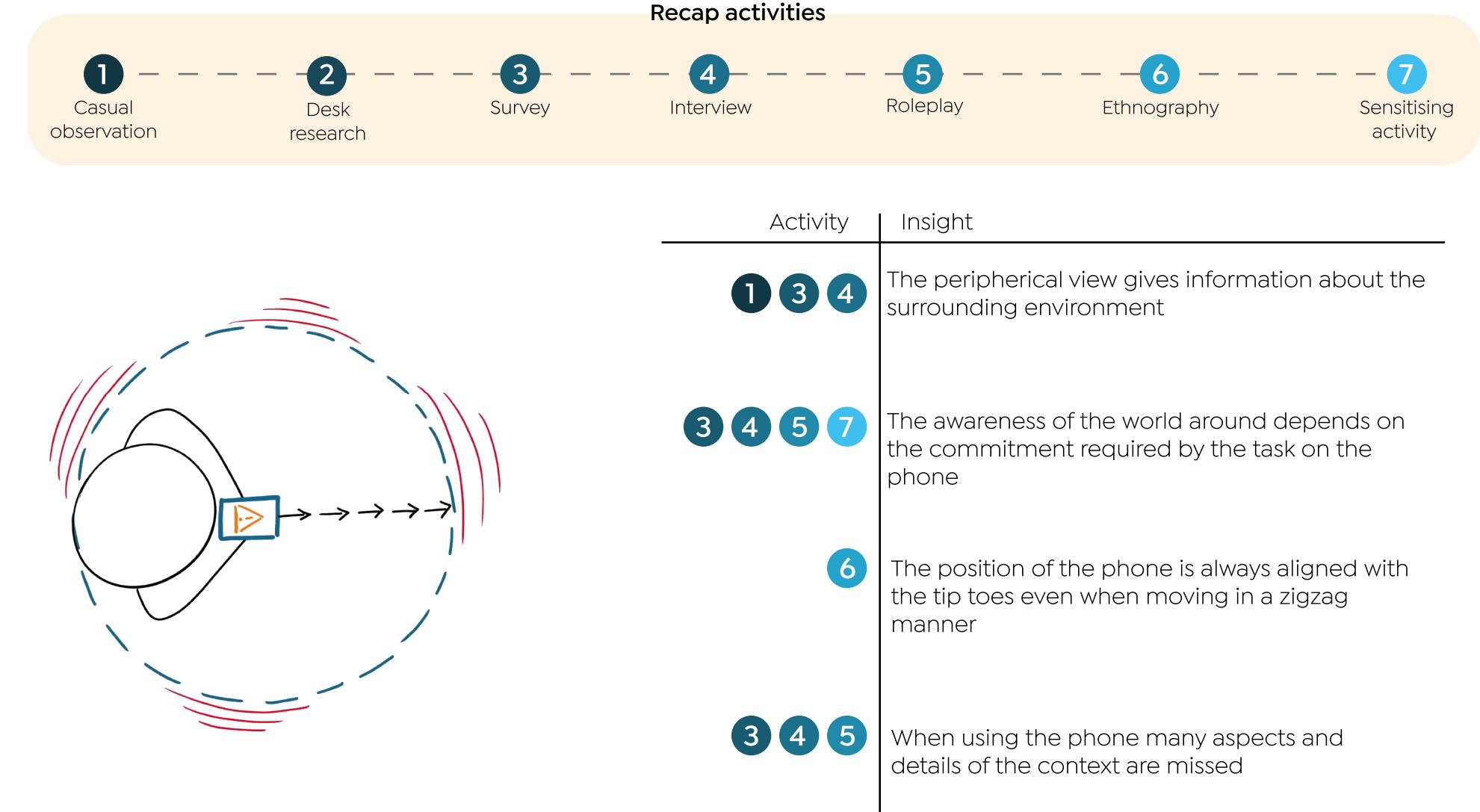


Activity	Insight
1 2	There are similarities in the experience of blind people & people that use their phone

Activity	Insight
5	<ol style="list-style-type: none">1. People using the phone tend to follow and trust the guide of the person in front of them2. When using the phone, the path plotted is inconsistent and unpredictable

Main insights

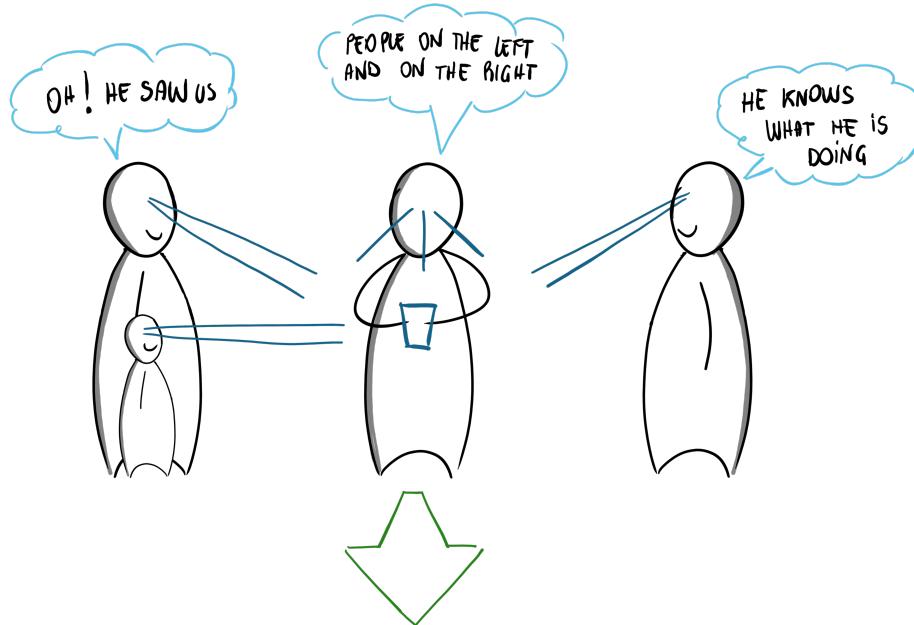
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Desired interaction

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People should be able to walk even when using their phone, for unpostponable reasons, without creating a chaotic situation for the others. Their path should be straight and predictable thanks to a clear communication through their body language.



Design direction

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My design direction is to create a multisensory device that allows implicit communication on multiple levels between phone users and others

See appendix from p. 53-88 for all the phase and details about the Cycle1

Appendix

Design goal process

Cycle 0

My design goal is to **allow city walkers** distracted by their phone to **be able to cross each other path** in a **more effective way**

Cycle 1

My design goal is to allow **city walkers**, that need to **use their phone while moving around**, to make their next steps **predictable and visible for the others**

Cycle 2

My design goal is to **fulfill pedestrians' need for autonomy and safety** when they use their phone **while walking in a crowded environment**

Research activity

Appendix

Casual observation

Why

To gain an overview of the selected context with all the possible situations and to map the flow of the current interaction

How

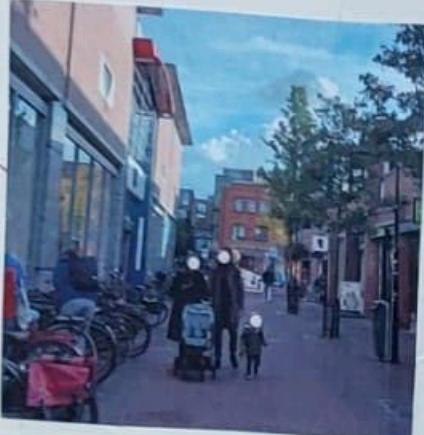
I walked around in the city center and i started to take random picture to pedestrians and I observed what they where there most typical behaviors and how people interacted with each other

What:

The pedestrian weren't following any instruction this because i wanted to be as unnoticed as possible to catch their real behaviors without any bias. In the following pages are collected pictures and observations

mother with the stroller and the rest of the family

One guy is looking at the phone, the other one is holding it



She stopped on the side

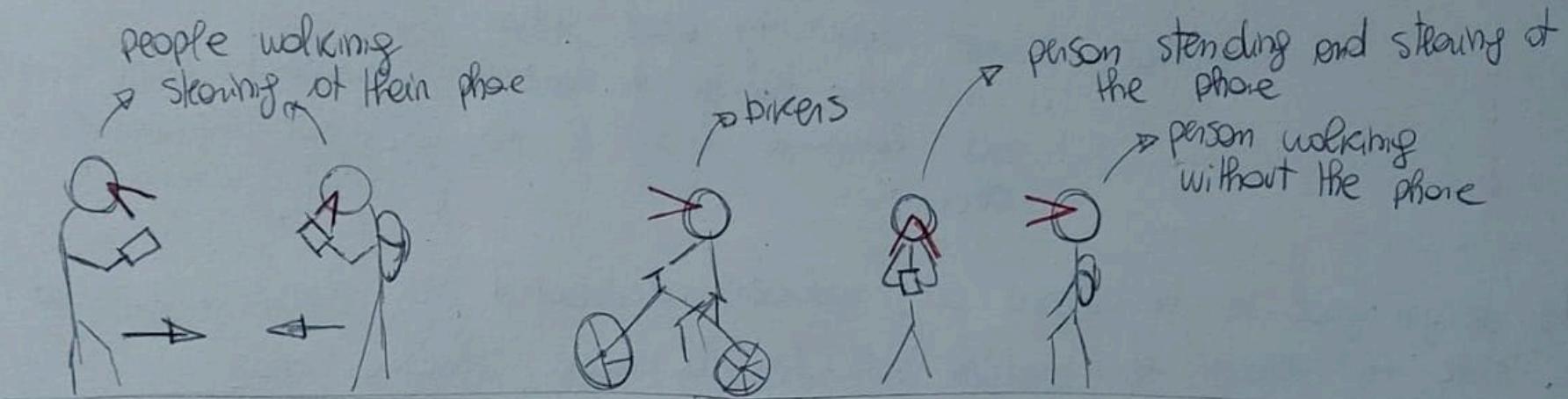


very focused on the phone *

all the three people were using the phone while walking



WHAT HAPPEN IN THE STREET ? CHAOS !



I observed for a while people walking/biking /... around for the city

- Most of the people walk and at the same time they steer at their phone
- another part is constantly holding his phone in the hand this means that soon or later they are going to use it
- Bikers don't usually use their phone, I saw only one or two daily that

Research activity

Appendix

Desk research

Why

To get inspired by other people's research/papers. To check what is already known about this topic and make connections between different fields

How

The source I used the most were Google, Google Scholar, Youtube

What:

I read many papers, watched videos about different topics more or less related to my context to build connections. in the following page you can find the most useful links

Active and passive echolocation

<https://www.jneurosci.org/content/37/6/1614>

<https://youtu.be/08smCjKWNL0>

Inattentional blindness

<https://www.safetytalkideas.com/safetytalks/distracted-while-walking/>

<https://nobaproject.com/modules/failures-of-awareness-the-case-of-inattentional-blindness>

Biomotion sound

https://pcwww.liv.ac.uk/sophiew/biomotion/bidet_caulet2005_auditorybiomotion_STSp_Neuroimage.pdf

Smombies app

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0197050>

Research activity

Appendix

Survey

Why

To gain insight into people's experience, need, and thought

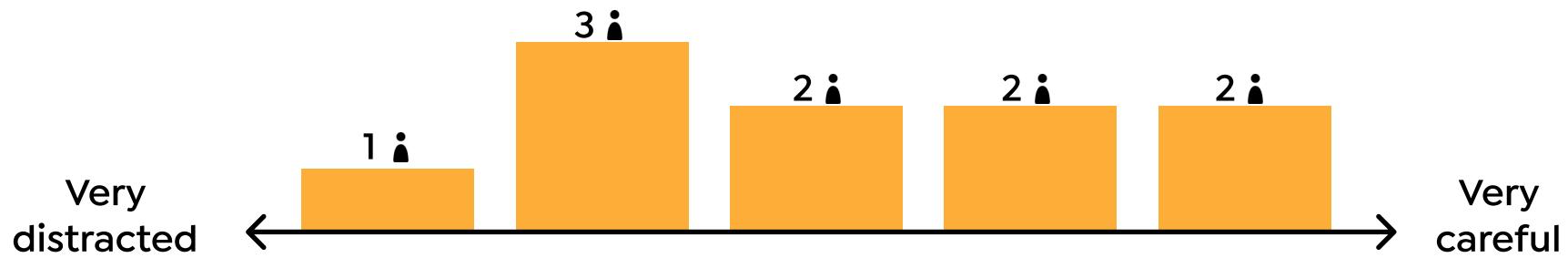
How

I submitted the online survey to 10 participants of different ages, gender and background

What:

The participants were asked to rate themselves as a pedestrian, express their thought, and their reason to use/not using their phones. In the following pages, all the questions and answers are reported

How would you define yourself as a pedestrian?



Could you briefly explain your previous answer?

Distracted by their thought

- Always good to keep an eye on what's going on around you. Still sometimes I loose myself in my thoughts.
- I am generally focused on my way but I tend to be distracted if I'm lost in thought
- I am not careful time to time while walking, being distracted by day dreaming, checking smartphone, etc.
- Sometimes I fell or don't see stuff around me while thinking
- I often walk against things and am fully up in my thoughts

Others distractions

- I listen to funny podcasts or call
- I am normally focused on what I am doing, to not crush against the cars and other people, but it happens that I am distracted by the phone or when I am in a group of friends

Very careful

I have mild anxiety problem. I'm careful for everything

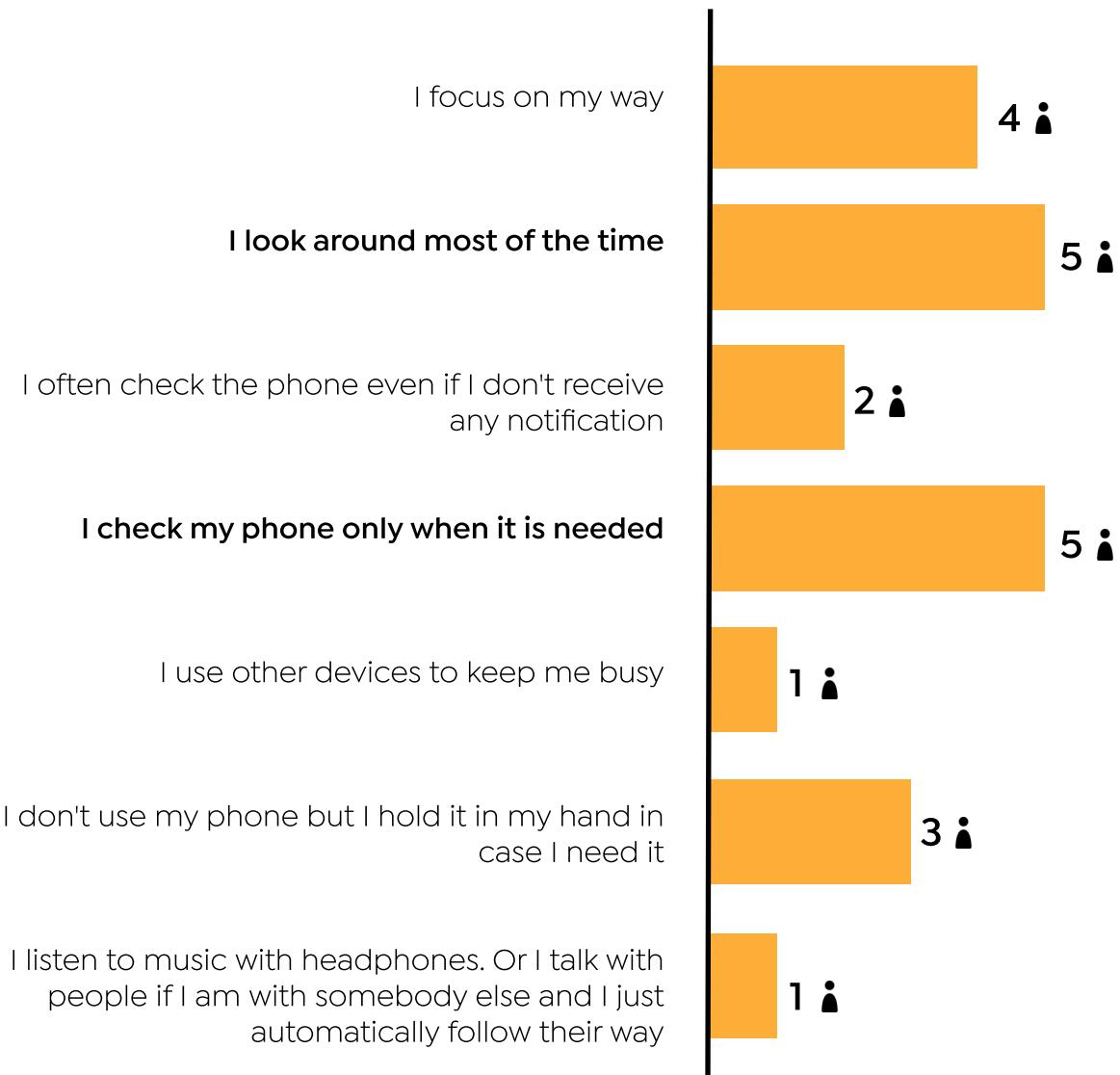
Others

i don't have a bike in the Netherlands

No reason specified

I never notice anything. When people ask me "have you seen that guy/woman/scene/ whatever" I never do. Literally they can kill a child in front of me and I would not notice anything

What do you normally do when you walk in the city?



Could you please explain why you act in the way you selected in the previous answer?

Notifications/Directions

I like listening to music while walking, I feel like I'm in a movie with a soundtrack. I follow my fellow's pathway because I have no sense of orientation and I just trust them. **I check my phone to read notifies** when I already know where I have to go, or I write people when I have to meet them. **I check it to look at Google maps** when I don't know the way

I dont have a good sense of direction so I must be very careful and **check on my phone for directions**

When I go to city centre it's usually for pleasure. I look at my phone **only to answer texts and look at directions.**

I often **check the messages I get while walking and even reply on them.** Also when I have to check the **route to the destination, I check it continuously.**

Pleasure/distraction moment

Since i am walking routs i know well or **i walk as relaxation**

unconscious action

I focus on my way because I need to reach the place I want to reach, but I am also **checking my phone even if sometimes I do not receive any notification,** because is a sort of **compulsive thing.** Sometimes I think about something else and I check it only when it is needed.

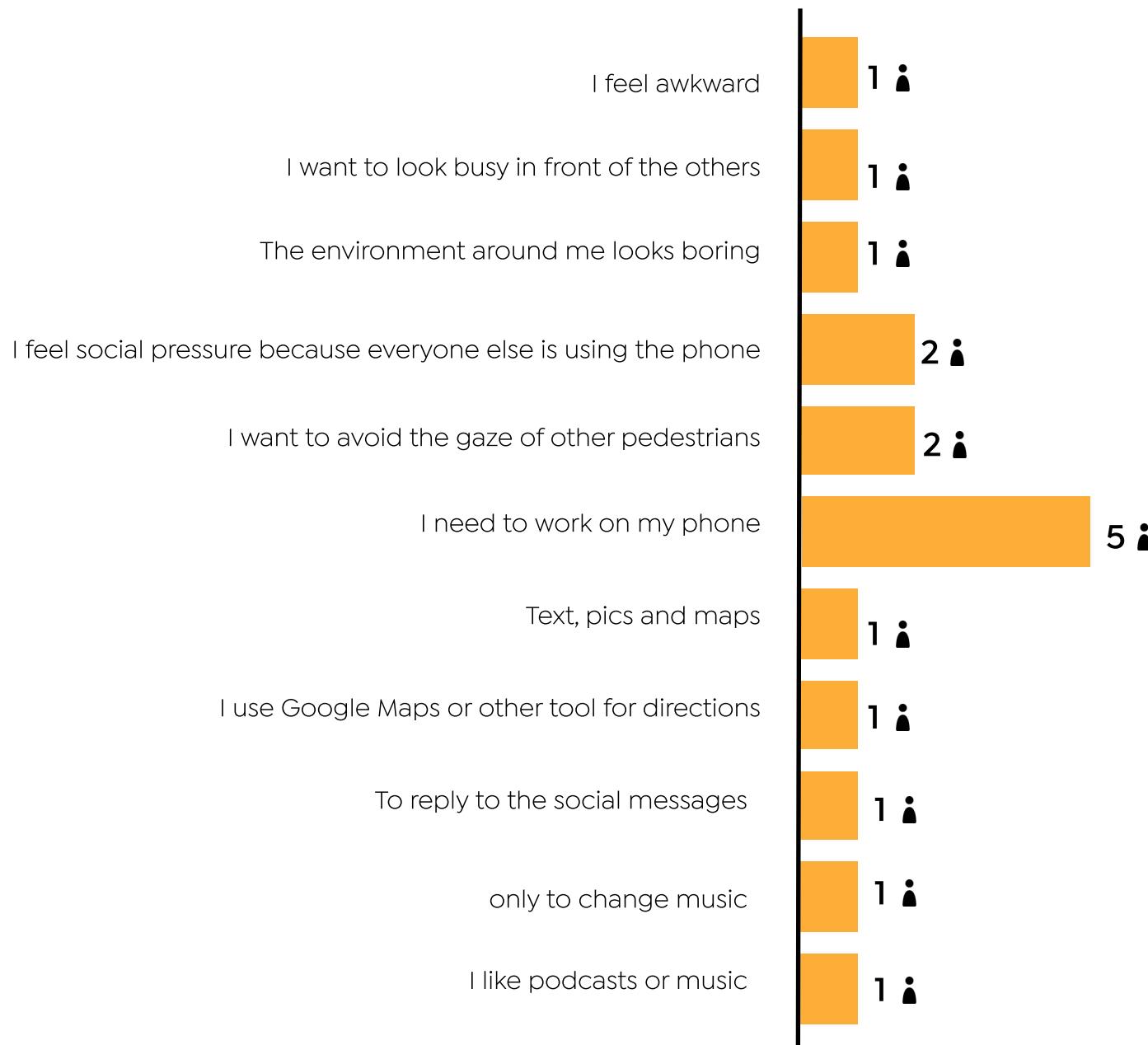
Careful about the environment

Because I like to have **music** and **just look around me to see if there is something interesting**

I feel silly to scroll on the phone when there nothing going on. And **I need to care for my surroundings** for cars, cyclers, and I want **to check if I look good when I walk pass windows**

Its nice **to watch other people**

What are the reasons that make you use your phone while walking? (You can select more than one)



Could you briefly explain your previous answer?

Awkwardness/social pressure/to look busy

While I am walking **I do not feel awkward**, while **when I am sit especially with people I am not comfortable with or in the tube or with other people I feel awkward and I want to look busy in front of others and sometimes I feel social pressure because the people around me use their phone.**

Sometimes **if I pass by a group of people** and I don't know what to do **I just look at the phone to avoid pressure**

I would **check on my phone if I'm standing still with someone facing me nearby**. I avoid eye contact cuz I don't want to attract attention

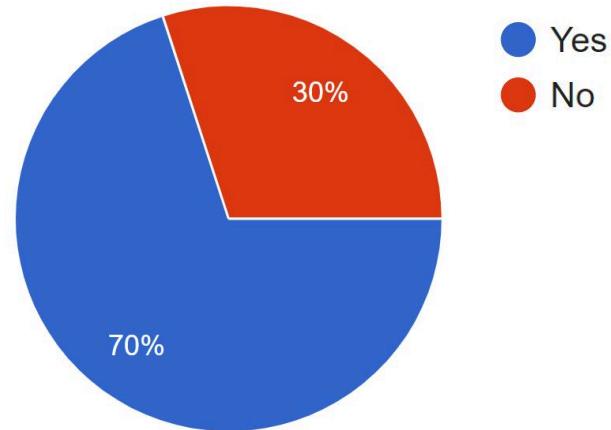
Directions

I Need app for directions because otherwise I get Lost

fulfill the need to be available

No matter if the **messages** is about work or just social stuff, **I prefer to reply it at the moment.**

Have you ever felt in danger while walking around and using your phone at the same time?



YES, I felt in danger

Almost get collided by a bicycle

Sometimes I was really close to clash with other people because I was using the phone, one time I fall because I did not see a step in the street

Because in the meanwhile I can't concentrate on my way or what is surrounding me. Maybe I step on something, I bump into someone, I get invested

Especially here in the Netherlands with bikes or cars

Bikes

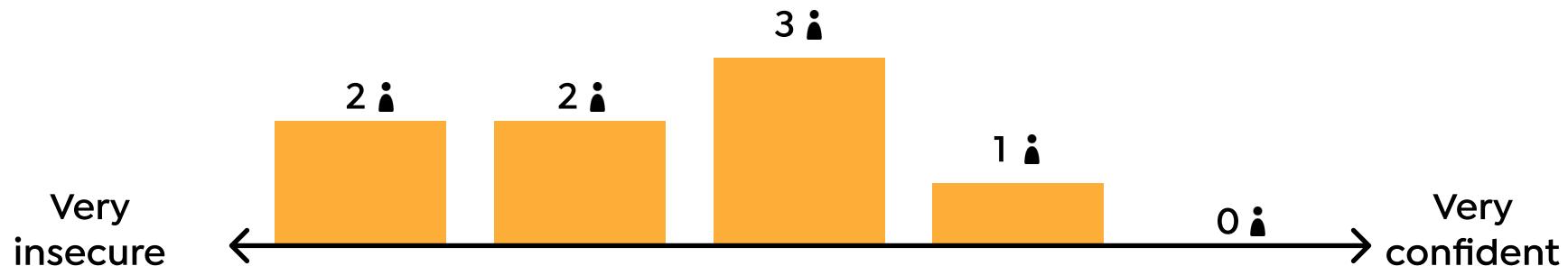
People are irritated and you cant see in front of you

NO, never felt in danger

No, i always prioritice my safety over my phone

Because First of all I pay attention to what happens around me

How do you feel while walking and using your phone at the same time?



I do not look at it, stop to use it (change music) or look at it at safe situations.

I dont like to do it

when I use it I am a middle way between feeling insecure and very confident, because I pay attention to the cars and big vehicles and I know that if I crash on other people would not put at risk my life

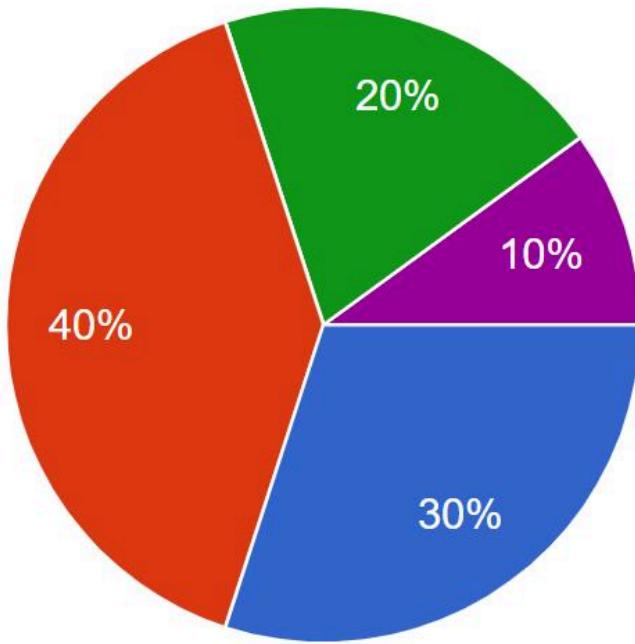
Sometimes I can just concentrate in both actions, especially when I just have to read. If I have to write it gets more complicated

I think I have a good balance of those

Sometimes i Need to put too much concentration looking at the phone so I feel in danger

Insecure, but if it is on the sidewalk for the pedestrian, it feels not that dangerous

How do you experience walking towards someone that is using the phone in the street?



- I feel very confident, I can always understand where the other is going to walk
- Often I have to focus on the other body language to understand how to move
- I feel more comfortable to stop and observe the other person action before stepping forward
- I don't feel comfortable at all when the others are using the phone while walking
- mostly not focussing so can bump into them

Other thought and experience

Sometimes I hate when people walk while using the phone because they obviously don't know where to go. It happened quite often that some of them were bumping into me and I get angry

Generally I have to change direction to avoid pumbing in the person that ls using the phone

I feel like more unsafe situations in the hague are with pedestrian groups or tourist that do not realize they are not alone in the street (example suddenly stepping on the street or walking with 5 people side by side so bicycles or other pedestrians cant pass) also, there are walking tours with earphones (on the phone) in the hague making this even more dangerous

Research activity

Appendix

Interview

Why

To gain some extra insight into the experience and feelings of the users in a more open and flexible way than the questionnaire

How

I Interview one person, it was an online meeting for logistical reasons. It started with direct question and answers but then it become more as a conversation and that is the point where i got more insights

What:

The participant was asked to answer and argument some questions that you can find in the next page

Interview



Marianna
25 years old

- Do you use your phone while walking?

Yes, very very often

- Why do you use it?

To check mails, messages, notification in general

- What makes you start the interaction with your phone?

Sometimes because everyone around me is using it, or to escape from a situation or avoid awkwardness.

- Do you keep it in an available spot or do you keep it in a bag and you take it out only when it is needed?

I either hold it in my hand or I keep it in a pocket that I can easily access to

- Have you ever felt in danger because of using the phone?

Yes, often I bumped into people because I was using my phone and sometimes I really don't know where to walk if the person that is coming towards me is using the phone

- Are you aware of the surrounding environment while you are using the phone?

If I take a picture of course yes, otherwise no

- How do you get aware that other people are getting too close to you?

When I get too close to others, when I look at the phone and I focus on it my peripheral vision can check an area around the phone and if I see someone stepping into it then I have to focus my attention on the street again

- Is there something you want to share about your experience?

I think that in a group when there is someone that is using the phone also the others start to use it automatically, it is an element of distraction in group conversations

Research activity

Appendix

Roleplay

Why

To compare people's typical behavior while walking with their phone and without it in a crowded environment to highlight pain points and possible intervention. This is one of the activity that gave me the most useful and interesting insights

How

I asked at first to one participant to walk in a crowded environment while using the phone. I decided to test during the market in the city center. While filming this person I noticed that the gait was not at all straight. I then asked the same person to walk in the same stretch of road without using the phone and it was already very much more straight.

I repeated the same test with two more people and I noticed a pattern in the comportment and in the plotted gait.

During the test I was filming the participant from behind because I noticed that when I was walking in front of them the participants were following me and they weren't acting naturally

What:

At the end of the test the participant was asked to answer and argue some questions. On the next pages you can find the plotted gait of each participant.

Walking experience from point A to point B while using the phone

YUN

"Sometimes everyone around me is walking with someone else, I feel lonely and awkward so i look at my phone"



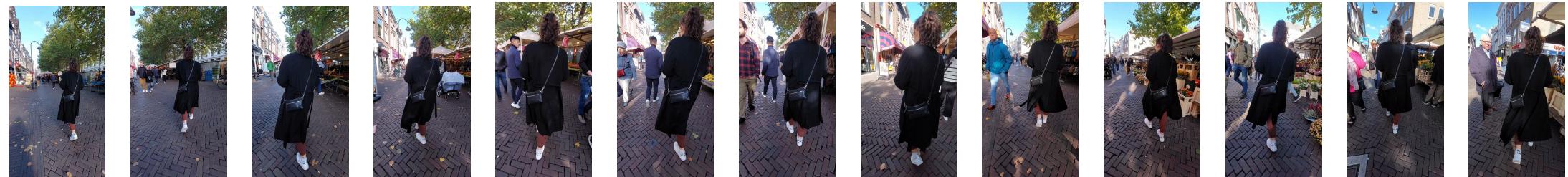
Walking experience from point A to point B without using the phone



Walking experience from point A to point B while using the phone

COSTANZA

"My awarness about the environment really depends on the task I am pursuing on the Phone. If it requires full concentration and it is very demanding I can not have control of the surrounding"



Walking experience from point A to point B without using the phone



Walking experience from point A to point B while using the phone

EDOARDO

"I noticed so much more about the surrounding environment when I didn't use the phone, there was so much going one and it was nice to observe it"



Walking experience from point A to point B without using the phone



Research activity

Appendix

Ethnography

Why

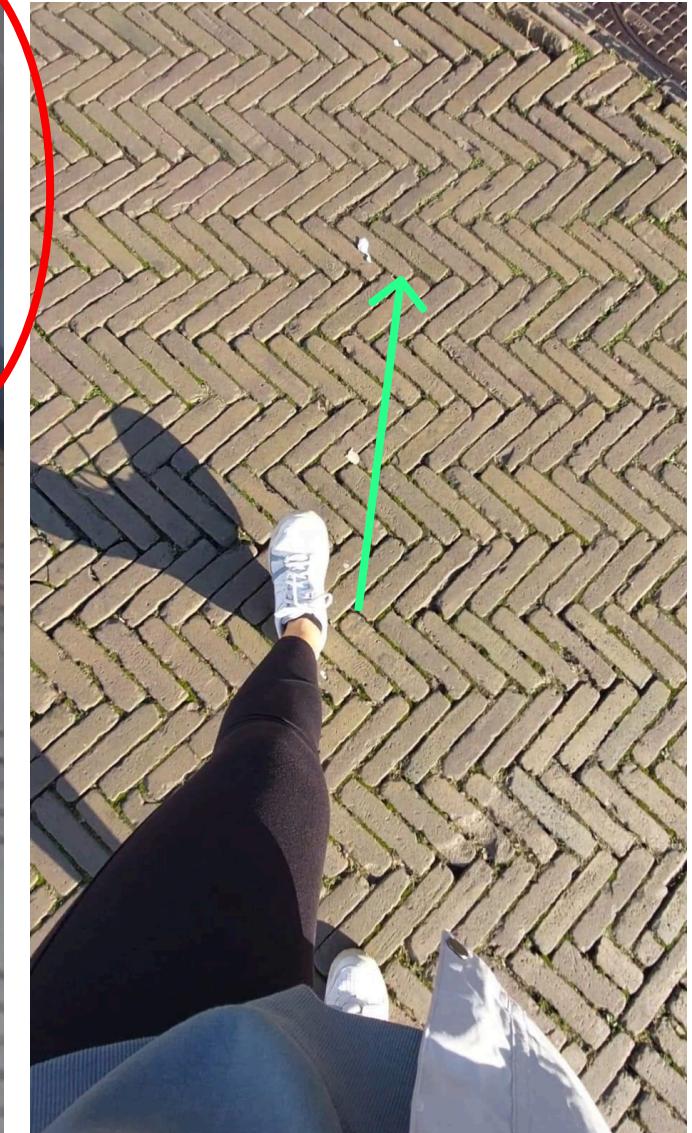
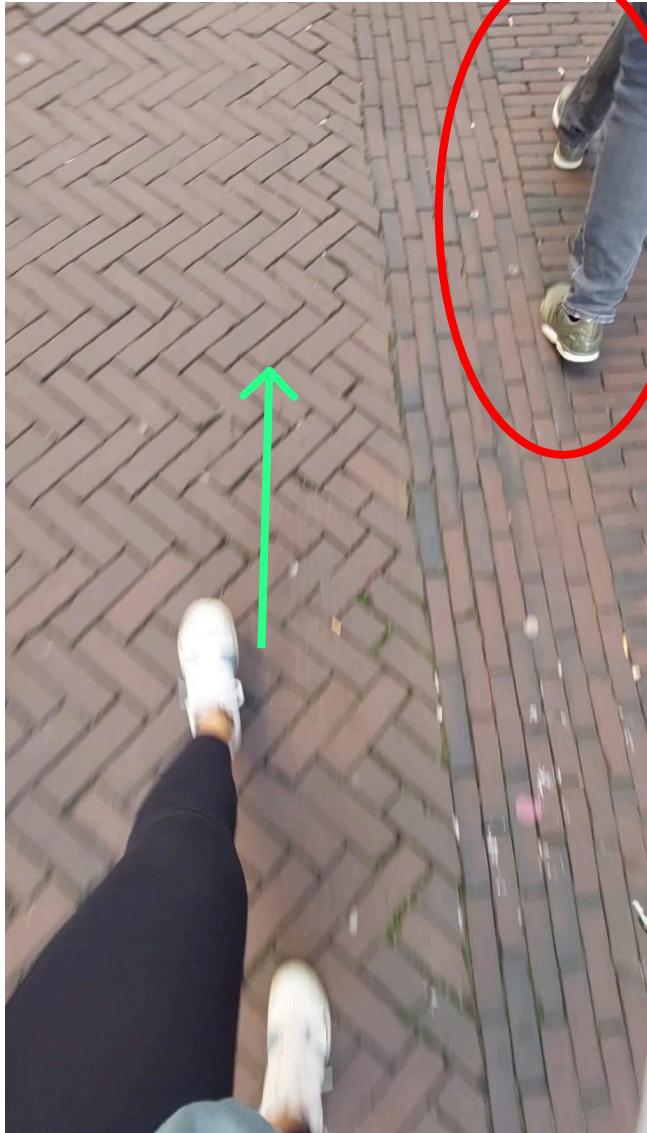
Since the current research focused on the interaction between humans and phones I also wanted to consider the smartphone point of view and see if something interesting would come up from that.

How

I started to film with my phone's camera while I was using it as I would normally do wandering around in the city center. I did it for around 20 minutes

What:

In the end I started to observe what my phone recorded and I noticed that even when I was zigzagging, the tip toes of my feet were always aligned with the phone



Research activity

Appendix

Sensitising activity

Why

To gain some extra insight into user's needs through the generative and making technique. I asked the participant to take part in 2 sensitizing activities and at the end of them I provided them with some tools for a collage we all talked together and discuss them

How

I submitted three tasks to three participants. They had to complete the firsts two individually and the third one collectively during a collage and brainstorming session

What:

The participants were asked to take two walks in the city center or in a crowded place. The first one while using the phone as they would normally do and the second one without bringing the phone with them. After each session they had to answer to some whort questions. After the two activities we had a collective activity in which they where asked to compose a collage. On one side they had to show they relationship with the phone, on the other side they had to show their relationship without the phone. In the following pages all the materials and results are showed.

The role of the smartphone in the interaction between humans when they are walking

First of all, I would like to thank you for your time and for your participation to this research activity, I truly appreciate.

Now, let me introduce the topic:

I am a master student in Design for Interaction at TU Delft. I am conducting a research project about the interaction between people walking around the city center. My aim is to gain insight about how people feel and act while they are walking. During observations I have noticed that most of the people, in some way, use their phone either they just hold it in their hands, or they actively interact with it. I would like to investigate the role played by the phone, to understand what kind of need it fulfill in this context.

The plan:

The activity is divided in 3 steps. The firsts 2 steps are individual (you are asked to do these two activities in preparation for the third one) while the third one will be a collective moment when you will share and discuss with the other participants your experience.

- 1º Activity → 15 minutes
Individual activity to do in preparation for the third one
- 2º Activity → 15 minutes
Individual activity to do in preparation for the third one
- 3º Activity → 45 minutes
Collective activity and discussion

The information you share by taking part to this research will be totally private and the collected data will be used only for the project purpose. I am curious to learn more about your experience and remember there are no right or wrong answers!! Thanks

Do you give me your consent to use the informations you share for my research project?

- Yes
- No

Name and surname

Sign here

Date

Activity 1

In this first part I am going to ask you to do an outdoor activity

I would like you to take a walk, you can for example go to the city center, the campus,... feel free to follow your instinct and maybe explore new part of the city.

It doesn't have to be an intensive trekking; 10 minutes will be enough but if you feel like you want to take more time you are more than welcome to do it. At the end of it you will be asked to answer to some questions.

There are some rules that I am asking you to follow, they will be relevant for me to make sure the data are not compromised, and the results of the different participant are aligned.

Rules:

- **Bring your phone with you** and use it as you would normally do
- Choose to walk in a **context where there are people around** (Supermarket, Market, campus, ect.)
- Choose an **environment with physical objects around** (Buildings, stands, people, ect.)
- **it should not be an empty and unobstructed environment** (not an empty square)

When the exercise is over, I would like you to answer to some questions, try to answer them right after so that your experience is still fresh in your memory (you can use text, images, drawing,...)

- For how long did you walk?
- Where did you walk?
- Where did you keep your smartphone during the exercise?
- Have you used your smartphone? And what did you use it for?

- Did you check your phone as an unconscious action or you did it because you knew exactly what you wanted to achieve with it?
- Did you feel like using your smartphone was something that you couldn't postpone?
- Were you distracted or you felt in full control of the environment around you while you were using your phone?
- Are there any moments you felt in danger because you were using your phone?

Activity 2

In this second part the assignment is very similar to the first one, I am going to ask you again to do the activity you did before but now the rules are different.

I would like you to take a walk, again, you should walk in the same place you did for the first exercise.

Again this time doesn't have to be an intensive trekking; 10 minutes will be enough but if you feel like you want to take more time you are more than welcome to do it. At the end of it you will be asked to answer to some questions.

There are some rules that I am asking you to follow, they will be relevant for me to make sure the data are not compromised, and the results of the different participant are aligned.

Rules:

- **Leave your phone at home**, if for some reason this is not possible, please put it in your bag and don't use it for the entire duration of the exercise
- Choose to walk in a **context (same place as before) where there are people around** (Supermarket, Market, campus, ect.)
- Choose an **environment with physical objects around** (Buildings, stands, people, ect.)
- it **should not be an empty and unobstructed environment** (not an empty square)

When the exercise is over, I would like you to answer to some questions, try to answer them right after so that your experience is still fresh in your memory (you can use text, images, drawing,...)

- For how long did you walk?

- If you have to compare the second activity with the first one what did it change?

- Did you feel the need to use your phone? if yes in which moment? Why?
- Was the need something that you could postpone to a second moment or an impellent need
- Are there any moment you felt in danger because you couldn't use your phone?
- About the environment around you, did you notice something that you haven't noticed during the first activity?

Activity 1

- For how long did you walk?

Costanza: 10 minutes more or less

Yun: 20 minutes

Valentina: 10/15 minutes

- Where did you walk?

Costanza: Market and the streets around it

Yun: from my home to the campus

Valentina: around the campus, on path along the IDE building and the mechanical engineering ones, and then I came back to IDE

- Where did you keep your smartphone during the exercise?

Costanza: In my right hand and sometimes I hold it with two hands (while texting)

Yun: pocket and hand

Valentina: For the first half (going ahead) on my hand to listen and record some audios, on the other half I put it on my pocket

- Have you used your smartphone? And what did you use it for?

Costanza: Yes, I checked the messages, opened Instagram and use it to change the music I was listening to.

Yun: Yes, checked time and hold it

Valentina: Yes, I used it to listen to some WhatsApp audios and to reply to them by recording another audio. Then I put it away on my pocket, and I took it twice to look at the time and to see if I had some notifications / someone wrote me.

- Did you check your phone as an unconscious action or you did it because you knew exactly what you wanted to achieve with it?

Costanza: It was mostly unconscious. The time I took it out I didn't have a clue of what I wanted to do with it but then I sent a message and I started to check constantly if the guy responded to me.

Yun: I did it unconsciously

Valentina: I knew what I wanted to achieve.

- Did you feel like using your smartphone was something that you couldn't postpone?

Costanza: So so, for some actions yes, like Instagram or socials in general. For others like texting back or change songs I think no

Yun: No, I could have postponed it

Valentina: I could postpone it, but I felt this was the right time and moment to listen these audios because I was not taken by another activity

- Were you distracted or you felt in full control of the environment around you while you were using your phone?

Costanza: I felt pretty conscious when I was in the square or in the sidewalk but I needed to look more around when I was crossing the street or I was nearby a bike lane or car lane.

Yun: I was distracted

Valentina: I felt in control of the environment as I was walking on a right path and I knew that I should have come back, but I surely was paying more attention on the audios than on the environment.

- Are there any moments you felt in danger because you were using your phone?

Costanza: Yes, while crossing the street

Yun: Yes, while crossing the road

Valentina: No, because I wasn't looking at it (so my sight was free to see any possible dangers, like bikes coming). I was just listening and recording while I was seeing where I was going to

Activity 2

- For how long did you walk?

Costanza: 30 minutes

Yun: 10 minutes

Valentina: 10/15 minutes

- If you have to compare the second activity with the first one what did it change?

Costanza: I looked more around me, saw more details but I also had the opportunity to think more about my day/what I have to do and so on

Yun: My mindset, I am worried about if anyone wants to reach me so i walked quickly

Valentina: I looked around me way more than before, and I felt like I was looking for something new and interesting that I have never noticed before

- Did you feel the need to use your phone? if yes in which moment? Why?

Costanza: Yes, because while I was thinking about my day and what to do I needed to write down or see if I had already something programmed. Also, I noticed more little details and since I like taking pictures I felt the need to have the phone to take them.

Yun: Yes when I left for 5 minutes because I was afraid of something urgent

Valentina: Just at the beginning, while I went out of the building, as a spontaneous gesture.

- Was the need something that you could postpone to a second moment or an impellent need

Costanza: The need of programming/planning my day could be postponed (it was just a reminder) The photo, tho, could be not

Yun: Yes i shouldn't have worried much about it

Valentina: I could surely postpone it

- Are there any moment you felt in danger because you couldn't use your phone?

Costanza: No, not at all

Yun: No

Valentina: No

- About the environment around you, did you notice something that you haven't noticed during the first activity?

Costanza: Yes, more little details. Especially dogs and behaviour of people in general

Yun: Yes

Valentina: Yes, I looked at both sides of the road, and I focused on things that I don't usually look at (like ducks, things on the canals, some details outside and inside the buildings that I could see from out of the window).

Pictures set for the collage

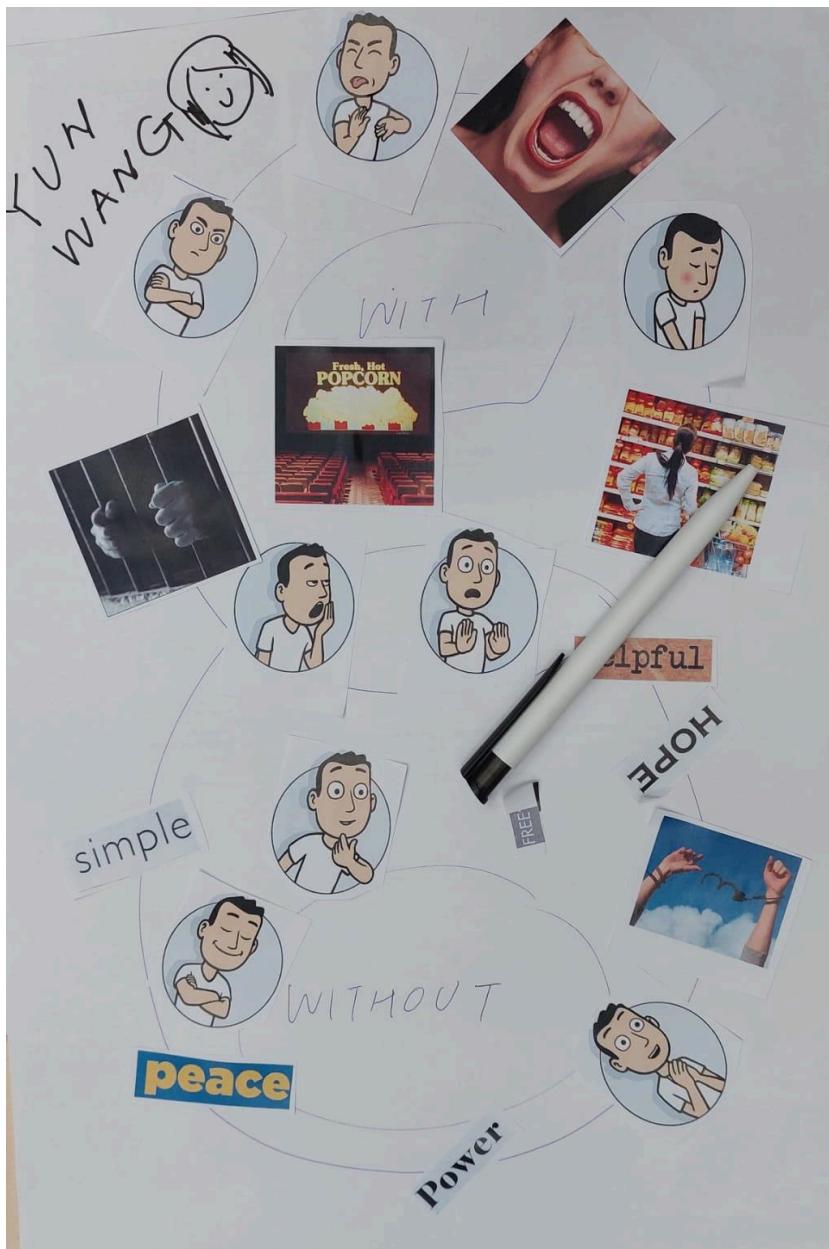


Words set for the collage



Bliss, fabulous, Awesome, happy, honey, Lovely, astounding, Glorious, Gallant, stunning, adorable, Marvelous, Graceful, amazing, cheery, Precious, dreamy, Passion, romance, happiness, magic, soul, Kindness, Wonderful, inspiring, Desire, charming, helpful, beauty, angel, flawsome, creativity, divinely, PEACEFUL, brilliant, Luck, PERFECT, HOPE, IMAGINE, Faith, LOVE, delight, enchanting, wise, SMILE, exquisite, Superb, neat, WONDERFUL, serene, GRACE, HEART, romantic, liberty, sunny, sweet, inspiration, BELIEVE.

Yun collage



Costanza collage



Overall Insight

Appendix

Insight from Observations (How people act)

1. Even if they don't use the phone actively they will **hold it in their hand** or in a very reachable place
2. When the participants are asked to walk in a busy environment while using their phone, **the gait is very inconsistent and unpredictable.** They are zigzagging between the obstacles (people and objects) or they are randomly stopping to walk and start again.
3. When people use the phone while walking they experience the **Cartesian split**, the mind is the software that runs on the body is the hardware (The mind explains behaviour while the body is the output device)
4. The more demanding the action is, the more unexpected the walk will be. **The ability** of the people **to combine the mind and body activity depends on the commitment** that the activity required (writing a mail, reasoning on something complex)
5. **Peripherical vision** is what makes people switch from the phone interaction to the environment interaction
6. The **body language gets misinterpreted** because of the use of the phones

Insight from Desk research and Literature (What we already know)

1. Research of Hisashi Murakami University of Tokyo about **the chaos created by people walking in the crowd with the phone**
2. The **white cane for blind people**
 - it makes people walk faster and consequently with better posture
 - it stimulates the curiosity of the blind
 - it shows to others around the next step of the blind person
3. **Komboloi** as an example of **antistress device**

Overall Insight

Appendix

Insight from interviews and questionnaires (How people think and how they say they act)

80%
Distracted

By their thoughts or the phone

20%
Careful

- They check their phone
 - To read notifications
 - To look for directions in google maps
 - For no particular reasons: social pressure, awkwardness, boredom
("I want to look busy" "A sort of compulsive thing" "When everyone around is using the phone" "When i feel awkward")
 - Music

70%
Danger situation

30%
prioritize safety

90%
Insecure when they walk using their phone

10%
Confident

70%
They don't feel very comfortable on walking towards someone that is using the phone

30%
It is not hard to tell where the other is going to walk

Overall Insight

Appendix

Insight from Observations and Acting activity (What people do in a controlled situation)

1. Even if they don't use the phone actively they will **hold it in their hand** or in a very reachable place
2. When the participant are asked to walk in a busy environment while using their phone, the gait is very inconsistent and unpredictable. They are zigzagging between the obstacles (people and objects) or they are randomly stopping to walk and start again.
3. The more demanding the action is, the more unexpected the walk will be. **The ability** of the people **to combine the mind and body activity** (Cartesian split) **depends on the commitment** that the activity required (writing a mail, reasoning on something complex)
4. **Peripherical vision** is what make people switch from the phone interaction to the environment interaction

Insight of ethnography research from the phone point of view (What is the phone experience)

1. The position of the **phone** it is always **aligned with our tip toes** even if we are zigzagging

Insight from sensitizing booklet and collective activity (What are people needs)

With phone

1. With the phone they were **worried to cross the street**
2. They **checked it mostly for irrelevant stuff** but also for **music and audio messages and photos**

Without phone

1. More **details were noticed** without using the phone
2. Without the phone there was the **constant feeling of missing notification or important call**