New opportunities to enhance or extend (mobile) web survey data

ESRA 2021

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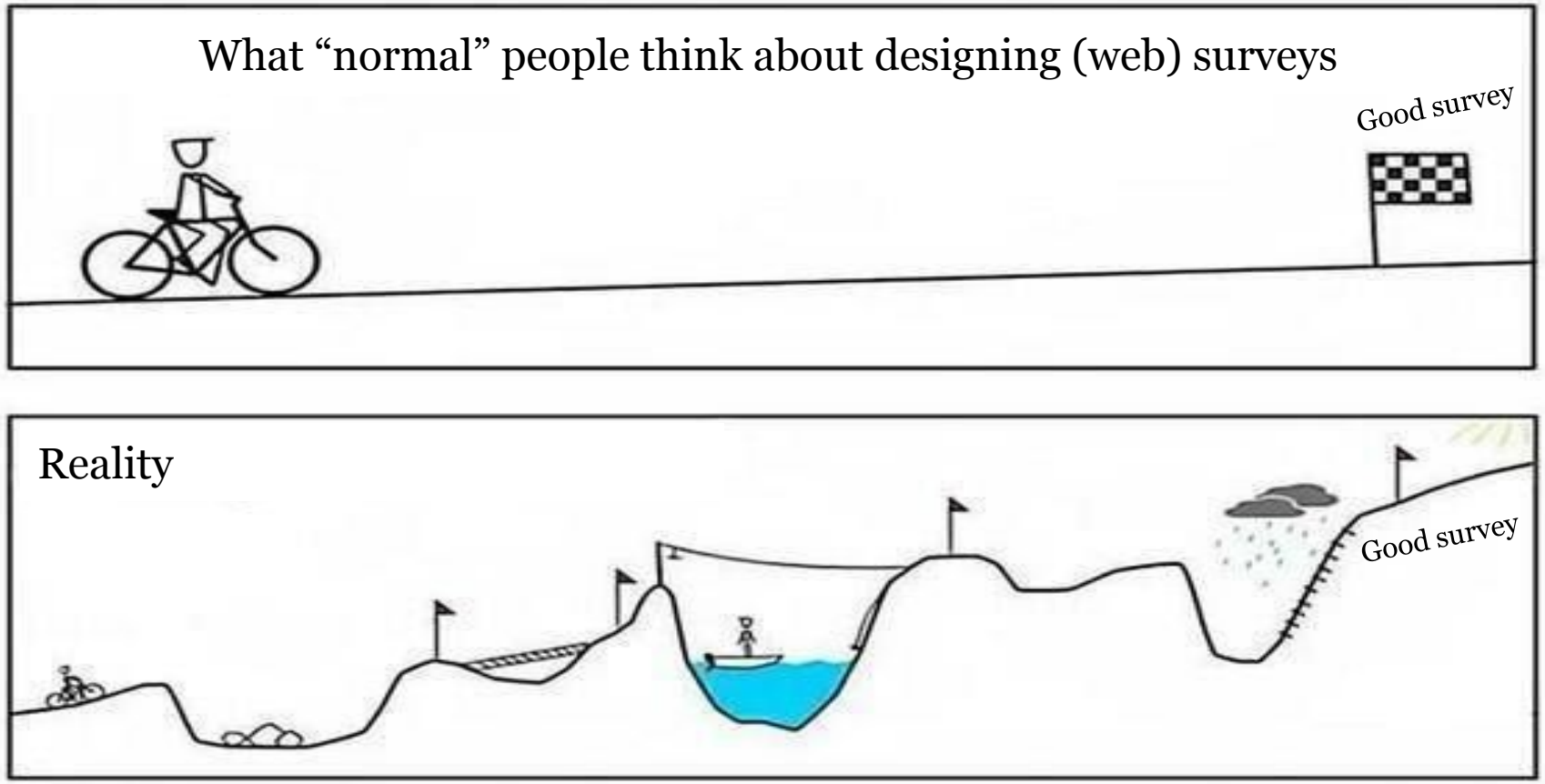
I want to thank Oriol Bosch, Mick Couper, Patricia Iglesias, and Carlos Ochoa for their help in preparing this presentation

Why do we need to enhance or extend (mobile) web survey data?

Importance of (web) surveys

- Surveys: most frequently used method for collecting data in many disciplines
- Results used by key actors to take decisions
- Web surveys: more and more common nowadays
  - 35% spent on research using (mobile) web, vs 11% for telephone and 8% for face-to-face (ESOMAR, 2019)
  - With pandemic, switch from other modes to web mode even quicker

Problem: Designing good (web) surveys is (very) hard



WHY DO WE NEED TO ENHANCE?

Surveys suffer from errors

My focus

- Both on representation and measurement sides

People do not know everything surveys ask about

Remembering-self ≠ experiencing-self (Kahneman & Riis, 2005)

To err is human

Lack of effort / satisficing

Social desirability

Errors on measurement side

- Measurement errors in surveys are large overall
  - Average **measurement quality** for 67 ESS questions across up to 41 country-language groups **= 0.65** (Poses et al. 2021)

- These errors can affect the results substantially

Table 6 Estimates of the parameters with and without correction

	Without correction On allow immigration	With correction for errors On allow immigration
By		
Better life	−.265*	−.609*
Economic threat	−.133*	.001
Cultural threat	−.154*	−.140*
Total explained (R^2)	.254	.547

Source: Saris & Revilla, 2016

→ Wrong decisions

Overall, need to improve measurement for many concepts

- But… How?
  - Need for improvement has been clear for decades
  - Lot of knowledge already on survey errors
    - How to reduce them
    - How to correct for them
  - But still large measurement errors
  - **What else can we do?**

How could we enhance or extend (mobile) web survey data?

Main idea

Taking advantage of **new measurement opportunities linked mainly to the growing use of smartphones** to reduce measurement errors in (mobile) web surveys

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Taking advantage of **new measurement opportunities linked mainly to the growing use of smartphones** to reduce measurement errors in (mobile) web surveys

Smartphones are **everywhere**

More people have smartphones than toilets worldwide[1]

Including in **web surveys**

On average, Millennials answer 79% of the surveys using smartphones and Boomers 36% (US Netquest panel 2017/2018; Bosch et al. 2018a)

→ **Create both new challenges and new opportunities**

My focus

[1] https://www.globalcitizen.org/en/content/access-denied-toilets-Harpic-Waterorg-RB/

New opportunities

- Opportunities at different levels (e.g., contact respondents)
- Focus on possibility to collect other data types
  - Lots of different data types
  - Each one has its own potential benefits and risks
  - Important to study them separately
  - Even if also a lot in common

HOW COULD WE ENHANCE?

New data types considered

Passive

METER DATA

Obtained through a tracking application ("meter") installed by the participants on their devices to register at least the URLs of the webpages visited

GEOLOCATION DATA

Obtained through a tracking application installed on participants' devices to register at least the GPS coordinates

Active

Most of those data can also be collected for PCs

VISUAL DATA

Screenshots
Photos/videos taken in-the-moment
Visual files saved on (or accessible from) the device

VOICE DATA

Dictation
Voice recording

These new data are already used in substantive research

- A few examples
  - Meter data
    - Fake news consumption (e.g., Guess et al. 2020)
    - Time spent online (e.g., Festic et al. 2021)
  - GPS data
    - Spacial context of physical activity (e.g., Krenn et al., 2011)
    - Travelling (e.g., Lin & Hsu 2014)
  - Visual data
    - Mosquitoes presence (e.g., Mosquito Alert project[1])
    - Plants diseases (e.g., Kaur et al. 2019)
  - Voice data
    - Level of literacy (ask respondents to read loud some text)
    - Survey children's of panelists

[1] http://www.mosquitoalert.com/en/

How could they help to enhance or extend (mobile) web survey data?

HOW COULD THE NEW DATA TYPES HELP?

Expected **benefits**

Researchers

- Reduce some of the issues related to measurement errors

Participants

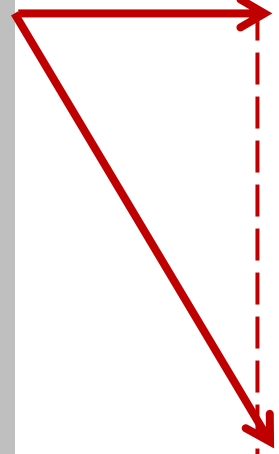
HOW COULD THE NEW DATA TYPES HELP?

Reduce some of the issues related to measurement errors

web data opp

Issue to tackle

- People don't know everything surveys ask about
- Remembering-self differs from experiencing-self
- To err is human
- Lack of effort / Satisficing
- Social desirability

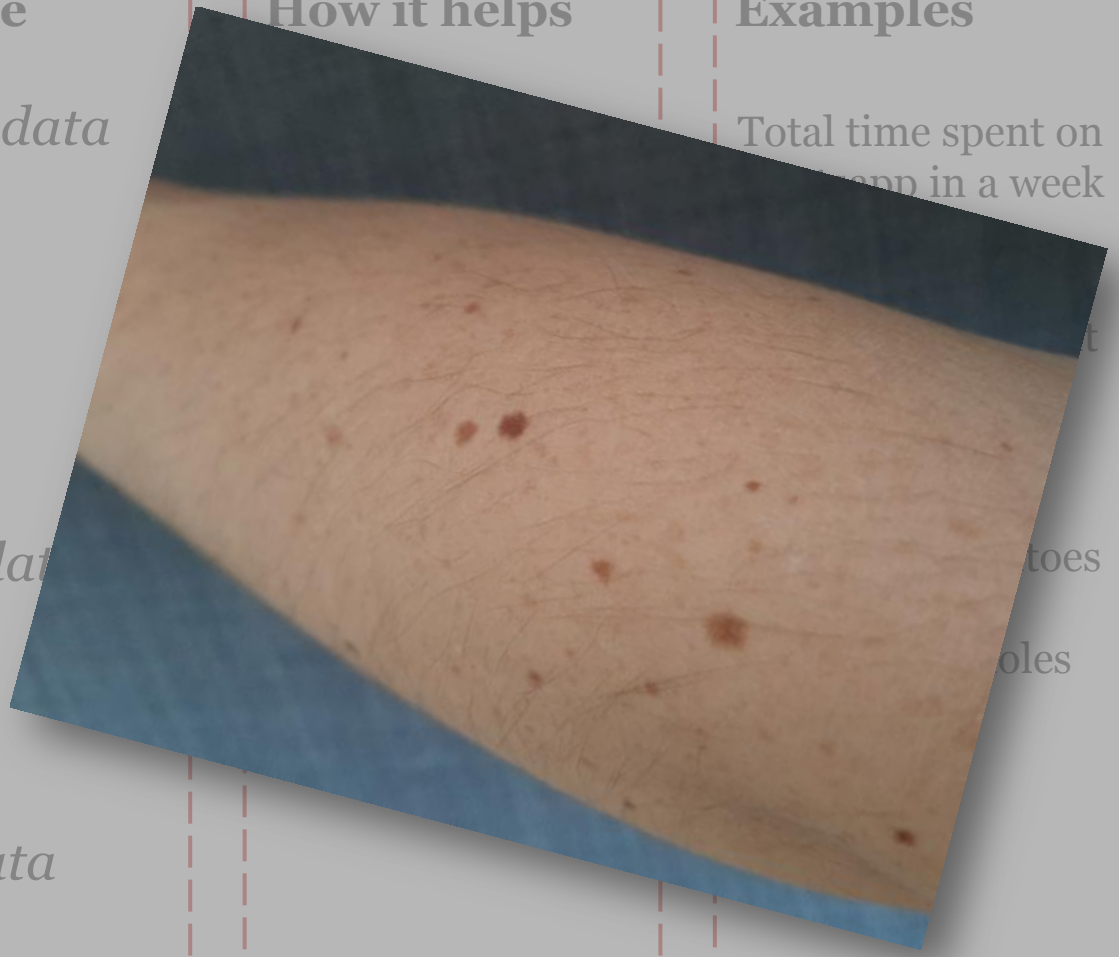


Data type	How it helps	Examples
Passive data	Only accept/set up Data comes without further participant intervention → no need to know	Total time spent on WhatsApp in a week (meter) Average time spent in travels (GPS)
Visual data	Participants need to share a file but not to be fully aware of its content	Type of mosquitoes Dangerous moles
Voice data		

HOW COULD THE NEW DATA TYPES HELP?

Reduce some of the issues related to measurement errors

Issue to tackle	Data type	How it helps	Examples
•	*Passive data*		Total time spent on app in a week
• T	*Visual dat*		toes
• La Sa			oles
• Soci desirability	*Voice data*		



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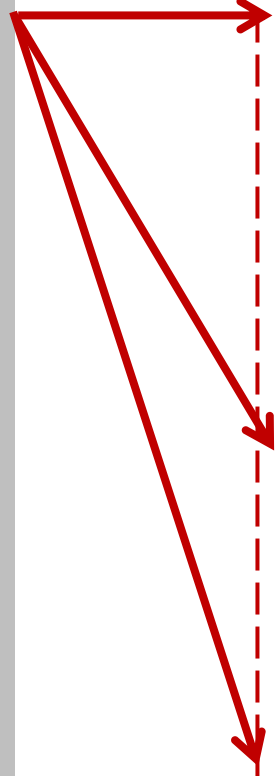

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Visual data	Participants need to share a file but not to be fully aware of its content	Type of mosquitoes Dangerous moles
Voice data	Information respondents are not aware of	Surroundings noise

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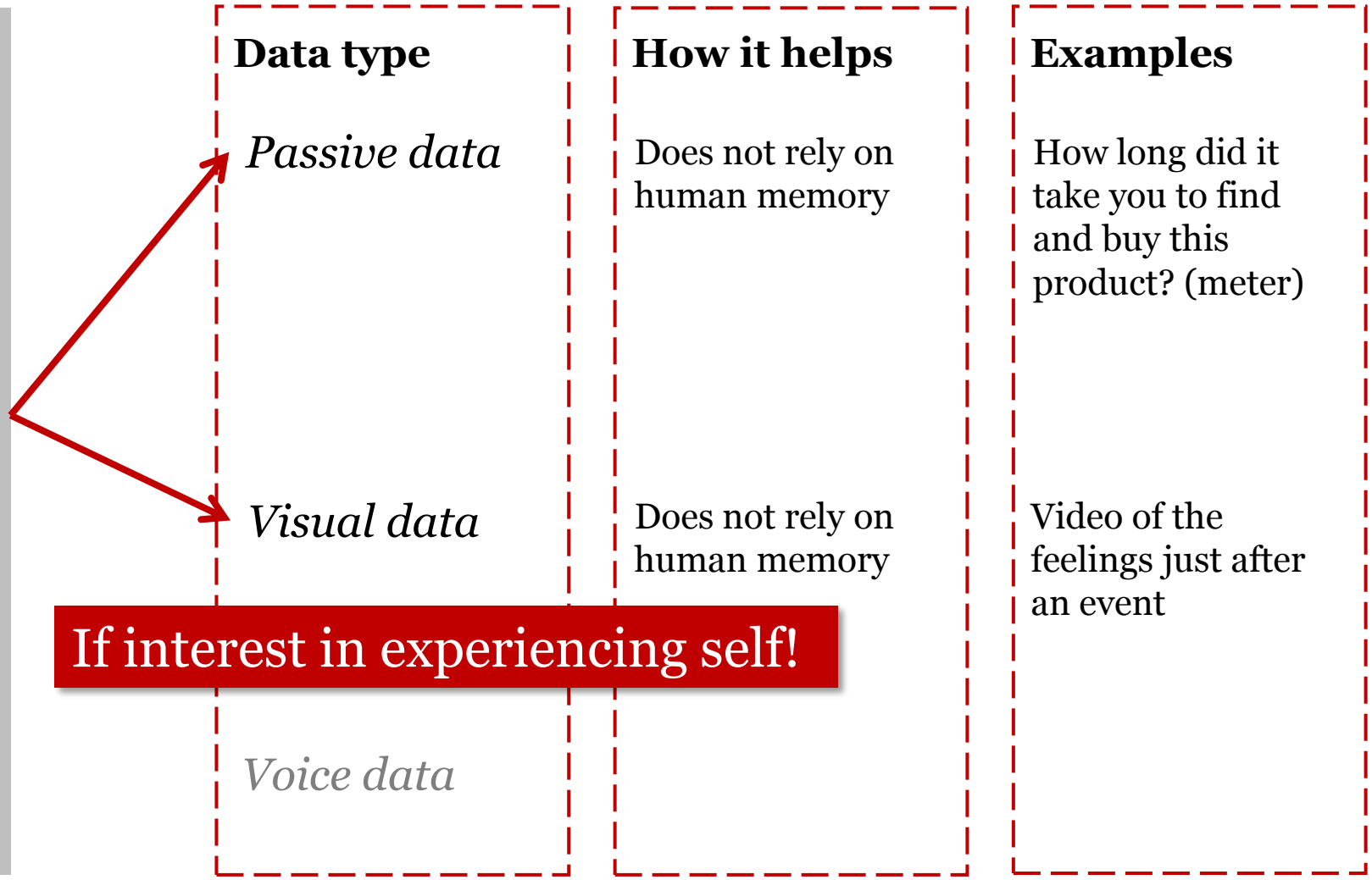

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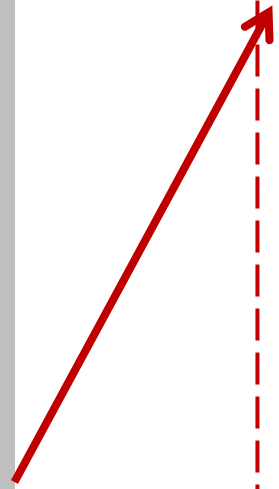

Data type	How it helps	Examples
Passive data	Avoids human mistakes of respondents	Did you read online political news yesterday? (meter) From where to where was your last journey? (GPS)
Visual data		
Voice data		

HOW COULD THE NEW DATA TYPES HELP?

Reduce some of the issues related to measurement errors

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Issue to tackle

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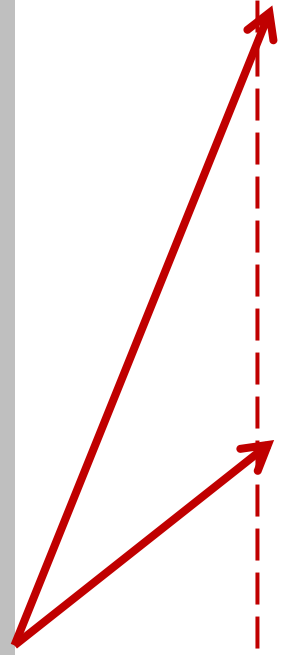
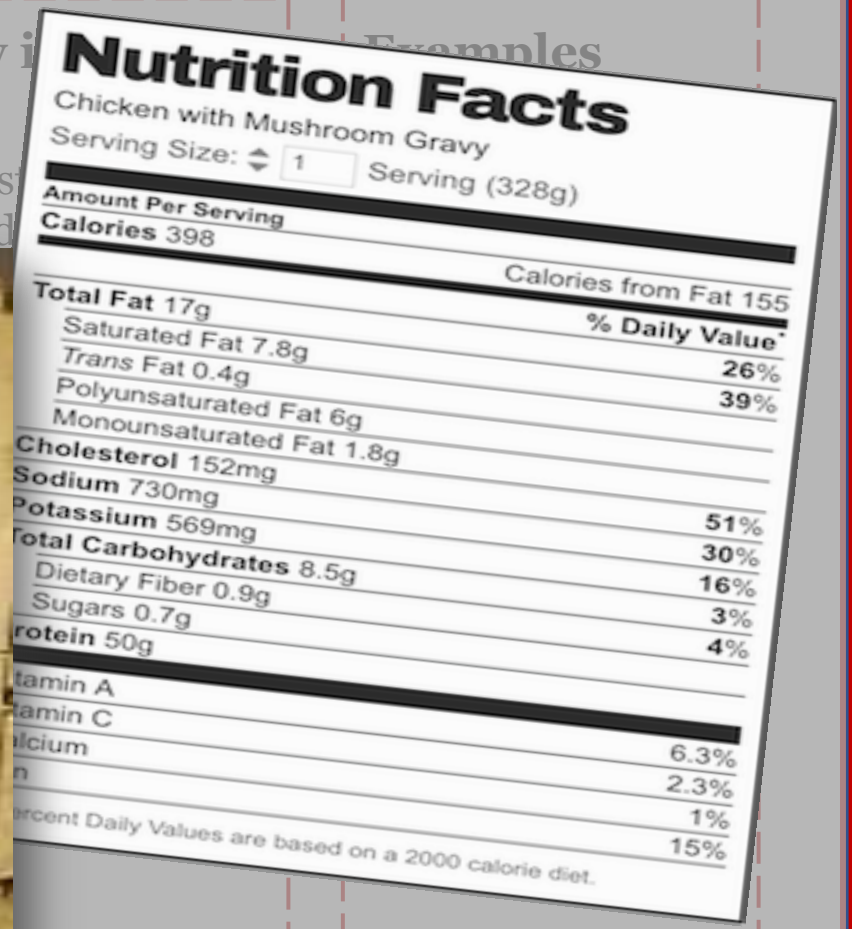


Data type	How it helps	Examples
Passive data	Almost no effort	List of webs they visited (meter)
Visual data	Might reduce effort (e.g., when replacing several questions or open questions)	Food people buy and their composition
Voice data		

How could the new data types help?

Reduce some of the issues related to measurement errors



Issue to tackle

- Satisficing
- Social desirability

Examples

HOW COULD THE NEW DATA TYPES HELP?

Reduce some of the issues related to measurement errors

Issue to tackle

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- Remembering-self differs from experiencing-self
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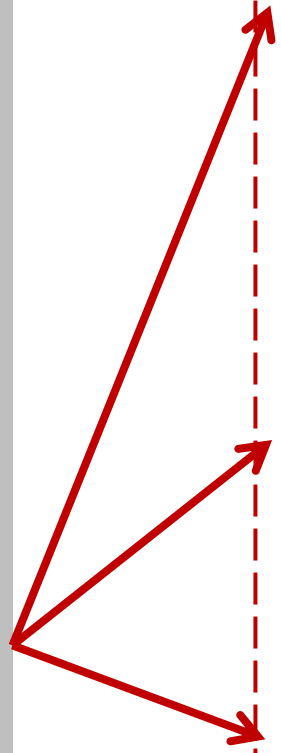
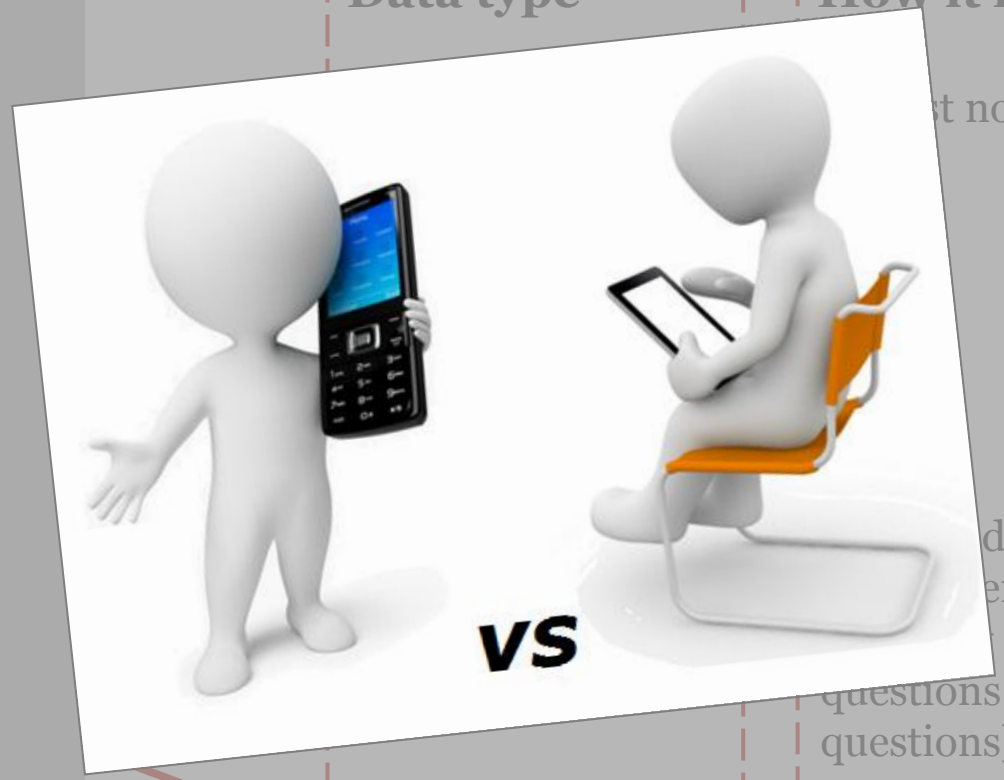


Data type	How it helps	Examples
Passive data	Almost no effort	List of webs they visited (meter)
Visual data	Might reduce effort (e.g., when replacing several questions or open questions)	Food people buy and their composition
Voice data	Might reduce effort (e.g. open narrative questions)	What do you think about the Catalan independence?

HOW COULD THE NEW DATA TYPES HELP?

Reduce some of the issues related to measurement errors

Issue to tackle	Data type	How it helps	Examples
• People don't know everything surveys ask about		t no effort	List of webs they visited (meter)
• Remembering-self differs from experiencing-self			
• To err is human			
• Lack of effort / Satisficing		duce effort en several questions or open questions)	Food people buy and their composition
• Social desirability	*Voice data*	Might reduce effort (e.g. open narrative questions)	What do you think about the Catalan independence?

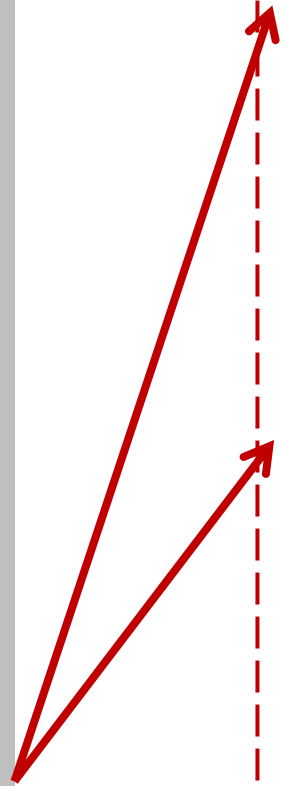


HOW COULD THE NEW DATA TYPES HELP?

Reduce some of the issues related to measurement errors

web data opp

Issue to tackle	Data type	How it helps	Examples
• People don't know everything surveys ask about	*Passive data*	Harder to present yourself in a socially desirable way: Need to think about it regularly and change behaviors	Stop visiting a given location or a given website
• Remembering-self differs from experiencing-self			
• To err is human	*Visual data*	Need to capture visual data in a specific way or look for false data, etc.	Illegal plants in your garden
• Lack of effort / Satisficing			
• Social desirability	*Voice data*		



HOW COULD THE NEW DATA TYPES HELP?

Expected **benefits**

Researchers

- Reduce some of the issues related to measurement errors
- Provide data for new concepts (not measured so far)
- Massive amount of data
- Real time / continuous (passive data)

Participants

- Reduce time dedicated to provide information
- Reduce efforts
- More enjoyable

→ Potential to **answer new research questions**

Do they really help?

What can we say at this day

- Clear that there is not a generic answer to this question
  - Depends on the concepts of interest
  - Depends on the data types
  - Depends on the target population
  - Etc.
- Overall, not much is known yet
- However, some studies exist about the different data types

DO THEY REALLY HELP?

Benefits?

Some types of problems might be reduced but other problems observed (e.g., 25% of respondents said they had difficulties to share images; Bosch et al., 2018b)

Researchers

- Reduce some of the issues related to measurement errors
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- Massive amount of data
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Maybe

Participants

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Schober et al. (2015): more precise answers for text than voice ≠ Revilla et al. (2020): more elaborated answers for voice

Benefits?

Researchers

- Reduce some of the issues related to measurement errors
- Provide data for new concepts (not measured so far)
- Massive amount of data
- Real time / continuous (passive data)

Maybe

People should accept to share such data

Participants

- Reduce time dedicated to provide information
- Reduce efforts
- More enjoyable

Do people accept to share such data?

Type of data	Examples previous studies stated willingness	Examples previous studies actual participation
Meter	Keusch et al. 2019; Revilla et al. 2019	de Reuver & Bouwman 2015; Revilla et al. 2021
GPS	Keusch et al. 2019; Struminskaya 2021	Scherpenzeel 2017; Bricka et al. 2009; McCool et al. 2021
Visual data	Wenz et al. 2019; kaya et al. 2021	Bosch et al. 2018b; Ilić et al. 2020; Ohme 2020
Voice	Revilla et al. 2018; Höhne 2021	Lütters et al. 2018; Gavras 019; Revilla et al. 2020

≈ 17%

≈ 30%

≈35%*

≈ 65%

≈ 54%

≈ 30%

→
- Both stated willingness and actual participation not very high
- Variations across data types
- Variations depending on other aspects (e.g., sponsor, interest in topic)

* % who registered a device; some of them did not really share the GPS data

DO THEY REALLY HELP?

Benefits?

Researchers

- Reduce some of the issues related to measurement errors
- Provide data for new concepts (not measured so far)
- Massive amount of data
- Real time / continuous (passive data)

Maybe

Yes but for reduced samples

Participants

- Reduce time dedicated to provide information
- Reduce efforts
- More enjoyable

DO THEY REALLY HELP?

Benefits?

Longer completion time for images (e.g., Bosch et al, under review) but lower ones for voice recording (e.g., Revilla et al. 2020)

Depends on data type but also to what we compare (e.g., Iglesias & Revilla 2021)

Researchers

- Reduce some of the issues related to measurement errors — **Maybe**
- Provide data for new concepts (not measured so far)
- Massive amount of data
- Real time / continuous data

Yes but for reduced samples

Participants

- Reduce time dedicated to provide information — **Depends**
- Reduce efforts — **Depends**
- More enjoyable — **No**

Lower satisfaction for images (e.g., Bosch et al., under review) and voice (e.g., Revilla et al. 2020)

DO THEY REALLY HELP?

Expected disadvantages as well

Researchers

- Selection bias in who participates
- New types of errors (e.g., technological errors)
- Need to adapt tools for data collection
- New skills needed for analyses
- More expensive
- Dependence on private companies
- Ethical / data protection issues

Participants

- Privacy issues
- Loss of control
- New skills needed (e.g. install an app)

However, **it depends** on the exact concept being measured, data type, sample…

What next?

WHAT IS STILL NEEDED

Better understand the errors of those data

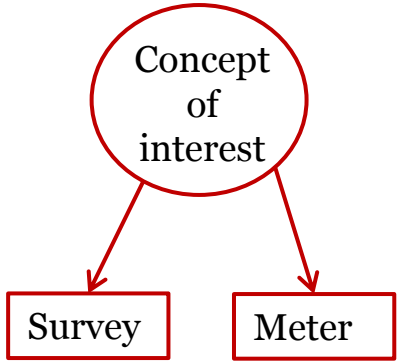
- Types of errors, their size and how they affect the results
  - E.g., meter data have a lot of limitations ignored in the existing substantive research (Bosch & Revilla 2021)
- Need also to develop ways to reduce/correct for these errors
- Differences across data types
  - Need research about each type
  - But also need to understand similarities and differences

Better understand **when** to use such data

- When does it make sense to consider these new opportunities?
  - Clearly not something that can be used to measure any concept
- Need to identify when benefits > disadvantages
  - Balancing those for researchers and participants
- Need to understand the mechanisms
  - Example: high nonresponse for visual data
  - Why? Is this due to technological failures? Non-willingness? Non-availability? A lack of skills? (Iglesias & Revilla 2021)

Better understand **how** to use such data

- To replace conventional survey questions?
- To combine them with conventional survey questions?
  - How?
  - Examples for meter data and surveys
    - Use meter data as triggering event to survey respondents at a specific moment ("in-the-moment surveys")
    - Use meter data to check respondents behaviors during the survey (e.g. if they look for information when asked knowledge questions)
    - Compare more subjective and more objective measures
    - Use both measures as indicators for a latent variable



Conclusions

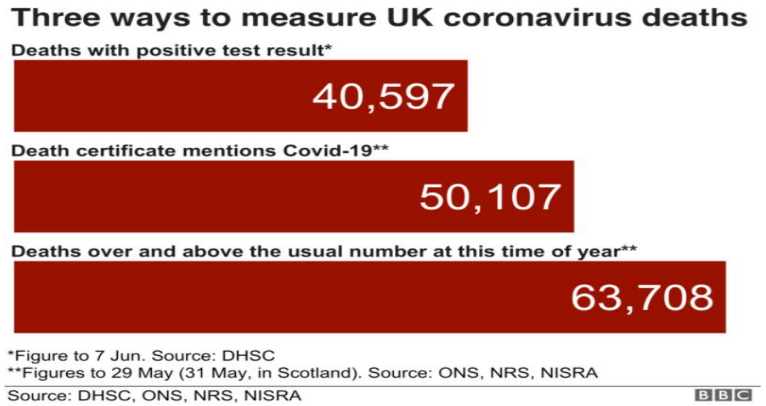
Need more research

- **Still a lot to be done**
  - Create frameworks
  - Apply to key issues
  - Provide guidelines to help researchers use these new data types
  - Etc.
- But potentially **broad applications**
  - Health: obesity (visual data); depression (meter)
  - Social sciences: travelling (GPS); feelings about elections results (voice)
  - Economics: spending (visual data); online banking (meter)
  - Etc.
- And potentially **new insights**!

And remember…

- Any data collection method suffer from errors
  - This is not just the case of surveys or of the new data types…

[1]



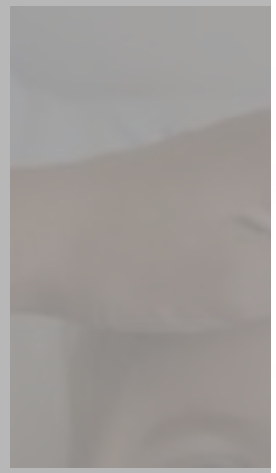
- Not realistic to aim to perfect measures
  - What we need is to **be aware of the errors and their consequences**
  - Try to minimize them / correct for them / look from different perspectives

[1] https://www.bbc.com/news/health-52976580

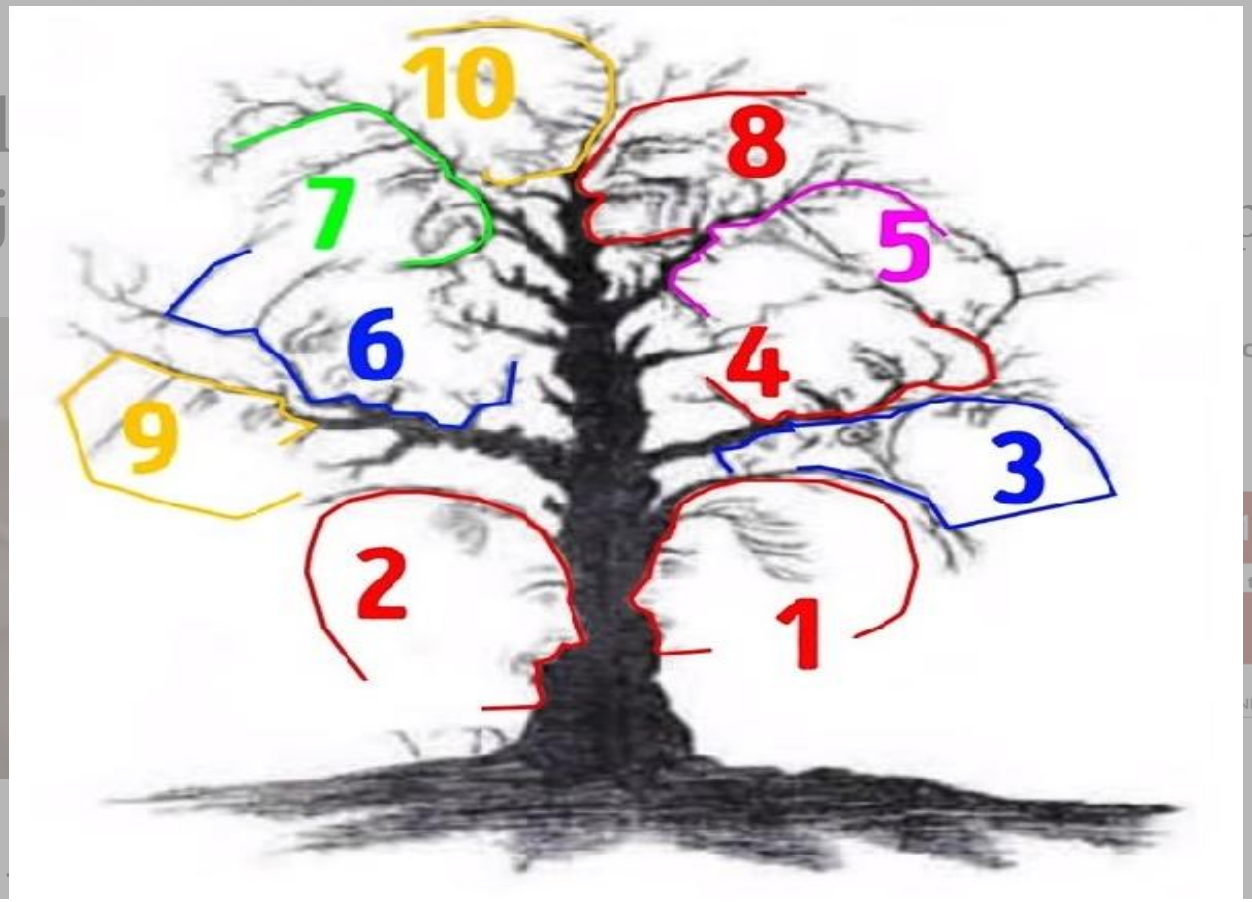
CONCLUSIONS

And remember…

- Any data coll
  - This is not j



- Not realistic



Looking from different perspectives can provide different but complementary information

[1] https://www.bbc.com/news/health-52976580

Finally…

Do not conclude too much from a given study!!

CONCLUSIONS

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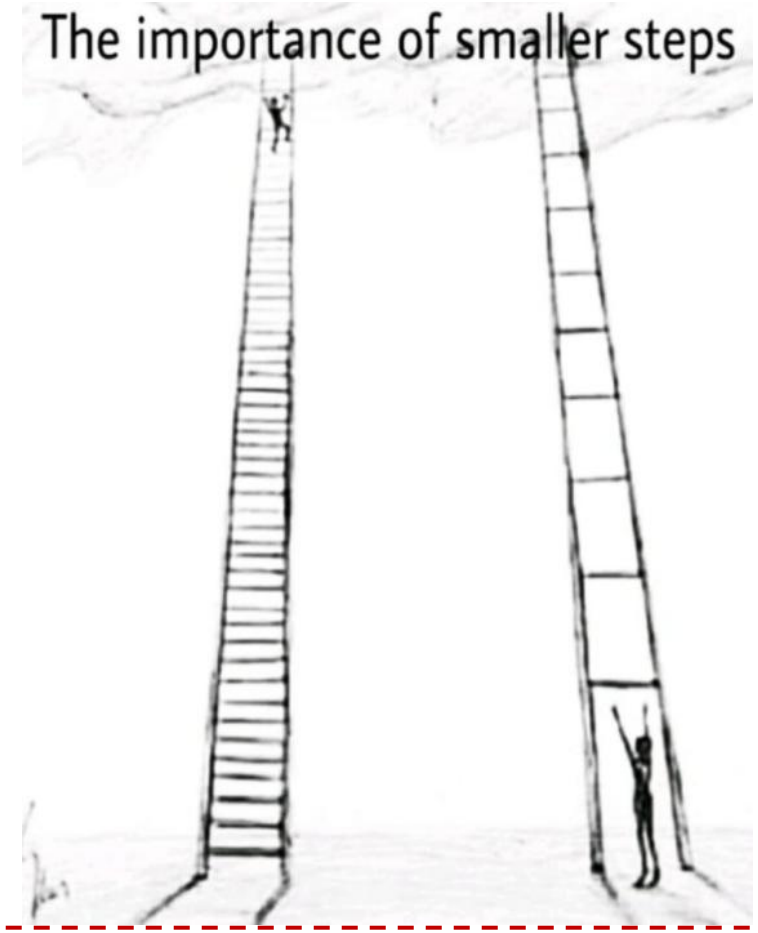

Do not conclude too much from a given study!!

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Thanks!

Questions?

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