Welcome

- If you are on an iPad or mobile device, we recommend you switch to a PC or laptop if you can.
- Please tell us about yourself and PhD topic in the chat
- Please make sure that you have downloaded the workbook

Clutch keys in hand.

Phone someone.

Tell someone you are going out.

Stick to well lit streets or busy areas.

Walk quickly.

Wear comfortable shoes so that you can run home.

Run home.

Message someone when you have arrived at your destination.

Fake phone calls.

Avoiding the situation entirely.

Turn around to see if someone is following you.

Would you walk home alone in the dark?

What steps (if any) do you take to reduce your risk or make you feel safer when you are walking home?

Sources: https://today.yougov.com/topics/lifestyle/articles-reports/2019/03/28/women-safety-sexual-assault-awareness

Clutch keys in hand.

Phone someone.

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Walk quickly.

Wear comfortable shoes so that you can run home.

Run home.

Message someone when you have arrived at your destination.

Fake phone calls.

Avoiding the situation entirely.

Turn around to see if someone is following you.

According to a YOUGOV survey conducted in December 2018, 46% of females always/often felt unsafe when walking alone at night. However for men, this was 11% (Smith, 2019, n=1620). The reverse was true for rarely/never feeling unsafe (females: 20%, males: 43%).

Sources: https://today.yougov.com/topics/lifestyle/articles-reports/2019/03/28/women-safety-sexual-assault-awareness

Bike frame is too big for me

Helmets can be too big for my head

Uncomfortable saddle

Do you have any problems when you hire a bike?
Would you ride a bike on the road?

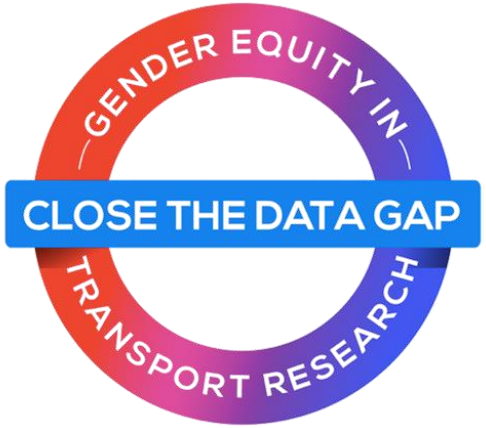
- Hire bikes are designed for the average-sized male.
  - Females are (on average) smaller and shorter than the average male.
  - These bikes may impair female riders' performance and cause discomfort and injury (Rogers, 2015).
  - Used mostly by men (de Chardon, Caruso & Thomas, 2016)
- 20% of men report being a 'regular' cyclist compared with 8% of women (Transport for London, 2014).
- In England, men travel on average 86 miles per year by bike compared to 21 miles for women (Stredwick, 2017).
  - Although, women are less likely to be killed when cycling on the road, they have a greater fear of traffic and concerns about their safety (Stredwick, 2017; Allatt, 2018).

Sources: https://www.cyclingweekly.com/news/latest-news/are-women-specific-bikes-necessary-164672; https://www.cyclingweekly.com/fitness/bike-fit/custom-bikes-womens-specific-geometry-381525; http://content.tfl.gov.uk/attitudes-to-cycling-2014-report.pdf; https://www.cyclinguk.org/article/campaigns-guide/women-cycling

CRITICAL* Project: On-Road Training Intervention

- Had 2 small framed-bikes, 2 medium-framed bikes and 2 large-framed bikes for participants to choose from.
- Also had specific women's bikes:
  - Saddle was suited to the female anatomy
  - Step though frames so that participants could wear a skirt
- They also had 3 medium and 3 large helmets and medium to extra-large sized high-visibility jackets.

* CRoss-modal Intervention To Improve Cycling Awareness Levels



Is Your Research Gender Equitable?

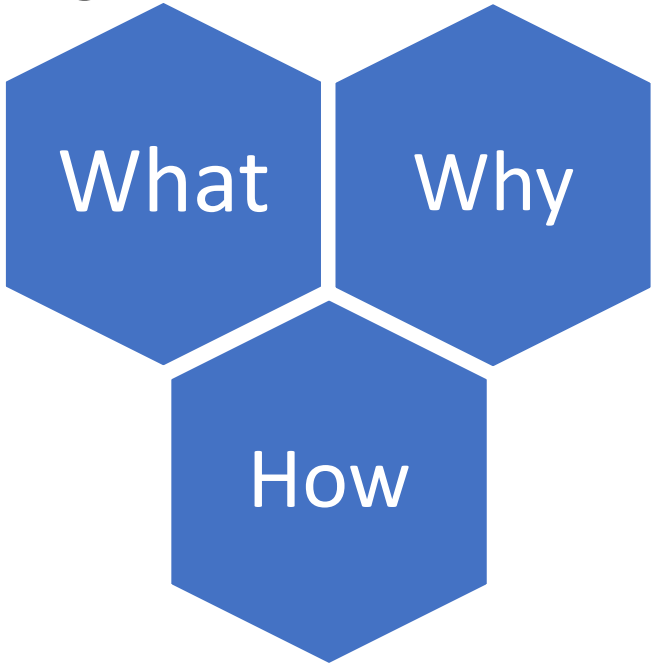
Good research practices and how to apply them to your PhD

Close the Data Gap Working Group

Aim and Objectives

- **Aim:** Provide you with an awareness of good gender equity research practices to inform better quality research

- **Objectives:** For you to gain an understanding of:



Safe Space

- A Safe Space is place or environment in which a person or category of people can feel confident that they will not be exposed to discrimination, criticism, harassment or any other emotional harm resulting from prejudice or discrimination on grounds of age, disability, marital or maternity/paternity status, race, religious belief, sexual orientation, gender identity, strand status, socio-economic status, culture or any other form of distinction.

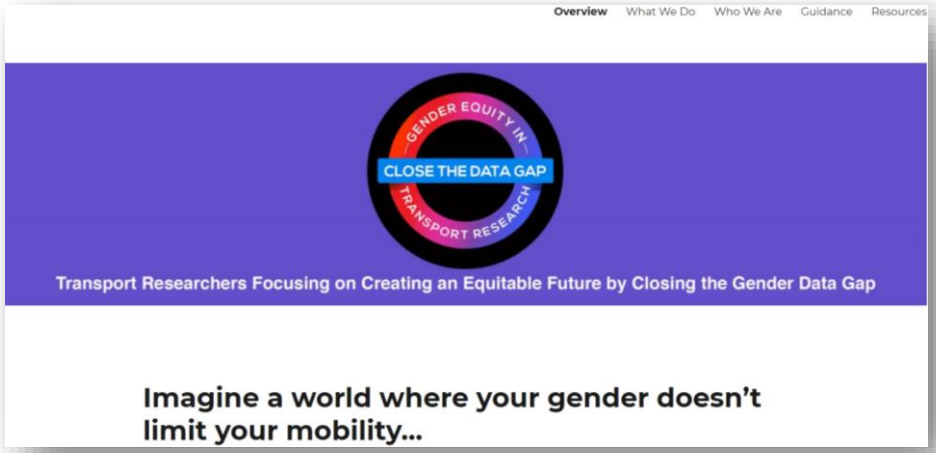
  - Please feel free to ask questions; there will be no judgement from anyone in the room if there is something you don't understand or are unsure of.
  - Please feel free to share any of the content we present but any discussions or input from yourselves should be considered confidential so don't take them outside of this room.
  - Make sure everyone agrees to the rules at the start.

Ground Rules

- Questions are welcome, but please wait until the end of the slide.
  - Please raise your hand or ask your questions in the comments section and we will answer your questions at the end of each slide.
- Recognise that gender and associated discussions can be difficult topics.
- Please:
  - Do:
    - Respect everyone and their opinions
    - Understand that people say things incorrectly, without meaning to offend; correct and inform
    - Work towards understanding
  - Do Not:
    - Interrupt people
    - Be insensitive or provocative

Who Are We?

- Why us?
  - We are diverse group of individuals who are passionate about ensuring gender equality and would like to share with you
  - Other sources may be available, and we encourage you to explore
- Why you?
  - You contribute to the world of knowledge as a researcher. The world is shared, and you can recognise that.
  - If not you, then who else?



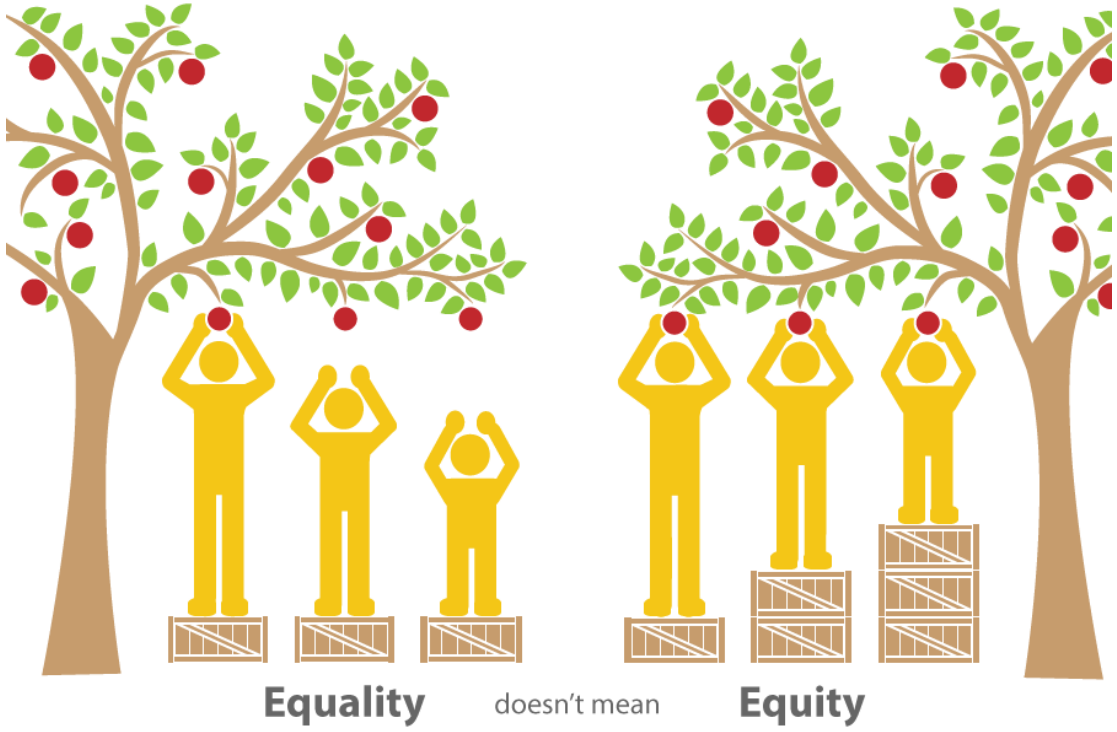
This training course has been designed, developed and produced by a diverse team of various beliefs, genders, race, sexual orientations, ages and stages in their research career (e.g. PhD students, Research Technicians, Research Fellows, and Academics).

Purpose of Close the Data Gap

- Inspired by Caroline Criado-Perez and their book 'Invisible Women: Exposing Data Bias in a World Designed for Men'
- Close the Data Gap (CtDG) aims to improve gender equity by enacting meaningful changes in research and its practices
  - Review our Practices – Are we doing the best we can?
  - Research Guidelines – Are we contributing knowledge of how is should be done?
  - Role Model – Are we showing how it should be done?
  - Raise Awareness – Are we making people aware?

N.B.: Although this working group is focusing on gender equity, we believe that all types of equity are important (e.g. age, culture, religion, sexual orientation). Some of the methods that will be described in this presentation can also help you apply these other types of equity in your research.

What is Gender Equity?



- *"Fairness of treatment for women and men, according to their respective needs" (International Labour Office, 2000).*
- *This may include equal treatment or treatment that is different but which is considered equivalent in terms of rights, benefits, obligations and opportunities (Mencarini, 2014).*

Why is Gender Equity Important?

Cinema and theatre seats were built using the female and male dimensions that were available at the time. However, these dimensions are now out-of-date; the average height for males and females has increased substantially over the last century (Davis, 2016; Villines, 2020), so these designs are no longer fit for purpose (comfort and vision):

- Tall Males may not have enough or any leg room (comfort).
- Shorter Females may not be able to see over the tall individual in front of them (vision).

Why is Gender Equity Important?

Male data considered 'unisex':

- Majority of PPE equipment is based around North American white male
- Poor, not available, not fit women – "even the smallest sizes are too big for some women":
  - "My hands are a size 6, I'm wearing a 6.5 glove"
  - "The goggles have a really good [protective] seal but they just don't fit."
- Inadequate seal

  → Risk of contamination, may not provide a complete barrier to virus
- Bulky

  → Discomfort, hot, unwell / impedes performance

"My stab vest usually chokes me when sitting in the Police vehicle. It rides up to my chin. Yes the stab vest only acts as sweat box in the summer and a heater in the winter. As far as being something to protect me against a knife, there are plenty of areas accessible to anyone who wanted to do serious harm."

"My vest is all loose above the breast area and towards the shoulder, so loose it sometimes bows out! The vest also has large areas uncovered underneath my arms as it sits quite low and butts up against my tack belt and equipment. It also infuriates me that the epaulettes made for stab vests are so big. Mine have to be folded under on the button side which is very uncomfortable. If this is not done I have two large 'handles' by which to grab my vest and therefore…me!"

Sources: https://www.bbc.co.uk/news/health-52454741

Why is Gender Equity Important?

Target users not provided for:

- 90% female nurses (Royal college of Nursing)
- 77% NHS staff female (nhsemployers.org)

  → Diminished capability in a crisis

"A complaint which many of my female colleagues have regularly made about the overalls is that they make it very inconvenient for female coastguards to use the toilet while wearing them. There is a double zip at the front which is great for males, but for female coastguards it is very impractical to go to the bathroom."

"Had many issues trying to get gloves that fit on freight. The size 13 rigger gloves initially given to me were dangerous for climbing on/off locos and thrown back at management. Hard hats are too big so I bought my own. Size Small is a) a rarity, b) mens small only. Women's boots are getting better but general hi-viz is still a massive challenge, orange trousers for example. Always have to wait longer for stuff to arrive as well."

Exercise: Activity One

Day to Day Equity

Grab handles on trains/trams

Covid Claws & Knives

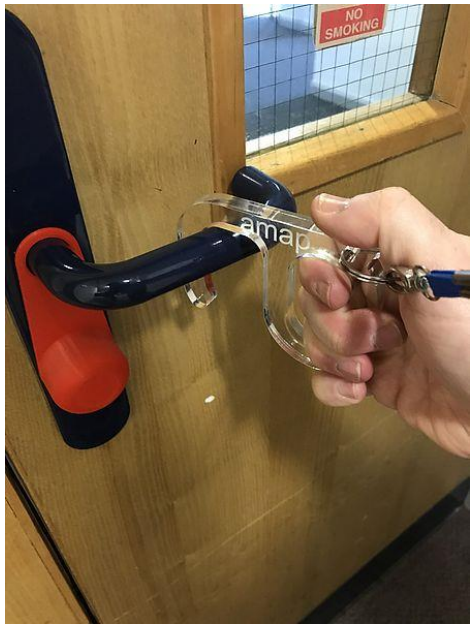


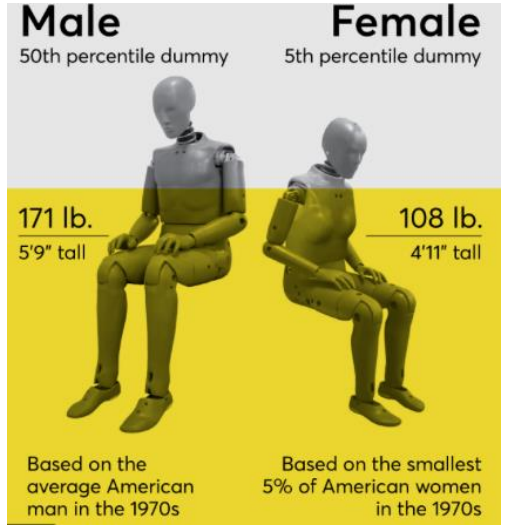
Image Source: https://www.troteclaser.com/en/news/2020-sunderland-university-covid-19/

But it is not all bad……

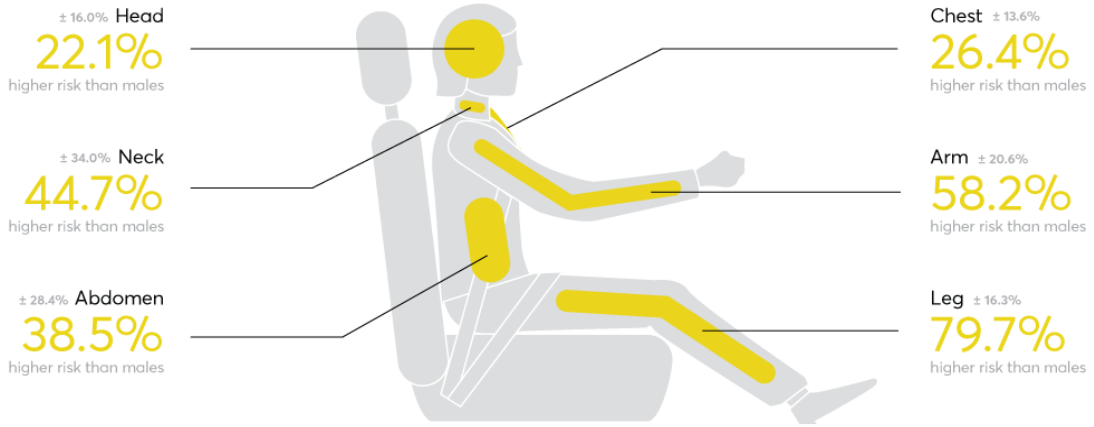
Source: Staff Matters #24: March 2021 (https://sway.office.com/So9zGG8BmYiSZGp8?ref=Link)

Why is Gender Equity Important?

- Design, Development and Testing of Cars→ inappropriate generalizations to a population from a non-representative sample → safety issues



- Worldwide - 50th percentile male used to represent whole adult population in crash test dummy research
- Singular EU regulatory test uses scaled down male dummy.
- NHTSA only adopted female dummy in 2003
  - Not anatomically representative - used 5th percentile female dummy (average height for females in UK is 5 feet and 3 inches).
  - Only tested in Passenger seat (!)



- Research about woman's bodies available since 1980s
- Cars designed based around Male data (higher muscle mass, different spinal column, longer legs, flat chest, narrow hips, no pregnancy)
- Most woman forced to sit out of standard driving position

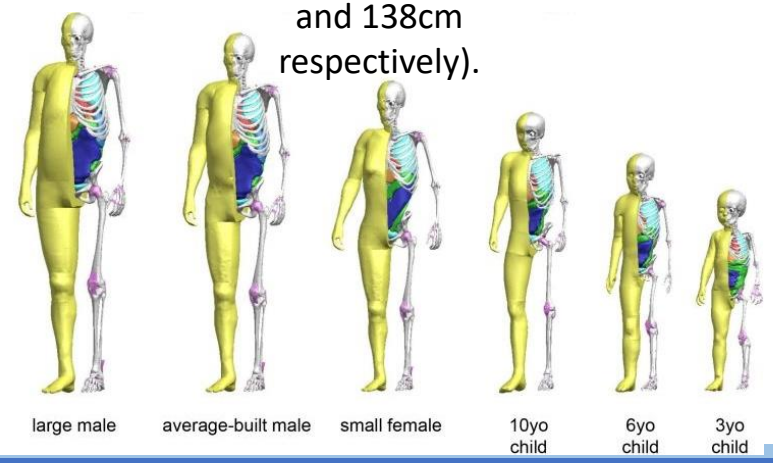
Sources: NHTSA Injury Vulnerability and Effectiveness of Occupant Protection Technologies for Older Occupants and Women; Gratton, 2019

Why is Gender Equity Important?

- Total Human Model for Safety (THUMS) is a Human Modelling Software Programme used alongside the traditional crash test dummies to conduct vehicle collision tests, analyse collision-related injuries and develop components such as seat belts and air bags.
- Used by over 100 vehicle manufacturers, suppliers, universities and research institutions.

1997	2000	2005	2008	2010	2011	2015	2016	2019
THUMS development began.	Launched First Version, using average adult male (175cm, 77kg) model.	Facial Modelling.	Brain Modelling.	Internal Organ Modelling.	Small adult female model (53cm tall) and a larger (189cm tall) adult male.	Muscle Modelling.	Children Models (ages 3, 6 and 10 at 94cm, 118cm and 138cm respectively).	Pre-collision posture and post collision injuries.

- Supposed to enhance vehicle safety and reduce risk of injury during collisions, however female models and a taller adult male model were not included until 2011. Before 2011, did this software improved safety and reduced risk of injury for these individuals?
- In a car crash, Females compared to similarly aged Males are 17% more likely to be killed and 73% more likely to be seriously injured (Forman, et al., 2019).



Source: https://mag.toyota.co.uk/thums-total-human-model-for-safety/

Why is Gender Equity Important?

The average size of smart phones is 5.5 inches long → too big for most female's hands and does not fit in their pockets (Criado Perez, 2019).

What is the most important factor if you were designing a phone?

Source: https://pudding.cool/2018/08/pockets/; https://www.independent.co.uk/life-style/women/apple-iphone-xs-max-new-too-big-size-women-sexist-feminist-a8537171.html

Why is Gender Equity Important?

The average size of smart phones is 5.5 inches long → too big for most female's hands and does not fit in their pockets (Criado Perez, 2019).

- Diehm and Thomas (2018) measured female and male pockets in 20 of the US most popular jean brands.
- On average, the front pockets in female's jeans were 48% shorter and 6.5% narrower than male front pockets.
- Only 40% of female's front pockets could completely fit one of the three leading smart phone brands.

- The female hand is on average an inch shorter and half an inch less wide than the average male hand → phones are too big for most female's hands.
- Affects female hand health; it can cause discomfort and repetitive stain injury.
- Apple have discontinued the iPhone SE which had a 4-inch screen. This is the only phone that fits the average female hand size (Petter, 2018; Criado Perez, 2019).

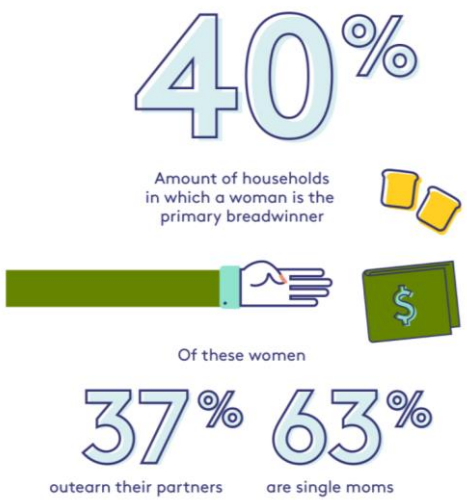
Source: https://pudding.cool/2018/08/pockets/; https://www.independent.co.uk/life-style/women/apple-iphone-xs-max-new-too-big-size-women-sexist-feminist-a8537171.html

Comfort & Screen Break

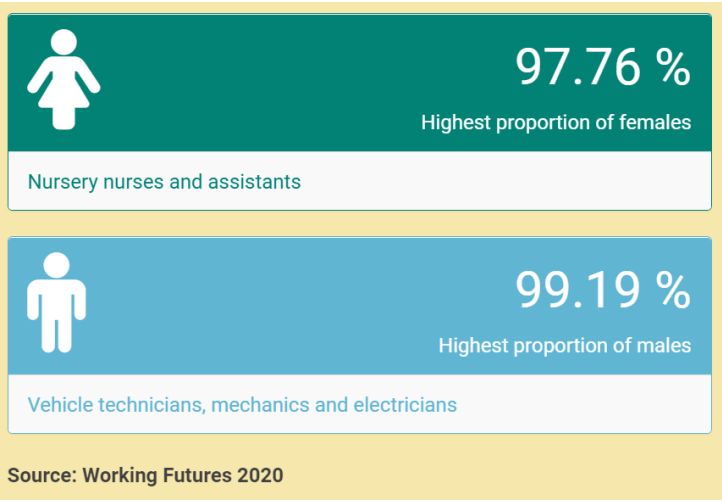
5 Minutes

Some Gender Considerations for your research

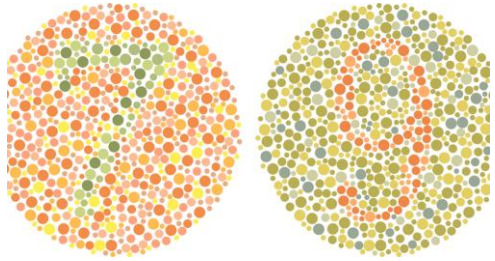
Family and Community Roles- Women and men have traditionally different roles within families and communities e.g. women are more likely to stay at home to look after children. Men are more likely to be the “bread winner” (R29 BRAND EXPERIENCES, 2018).



Labour Market- Different job sectors tend to have different compositions of women and men e.g. more pilots, builders and engineers are male, men are more likely to have higher ranking roles (Working Futures, 2020).



Medical Conditions- Men and women are more susceptible to certain conditions. This could influence how a system/interface/object/tool/ document should be designed. e.g. men are more prone to red-green colour blindness (National Eye Institute, 2019).



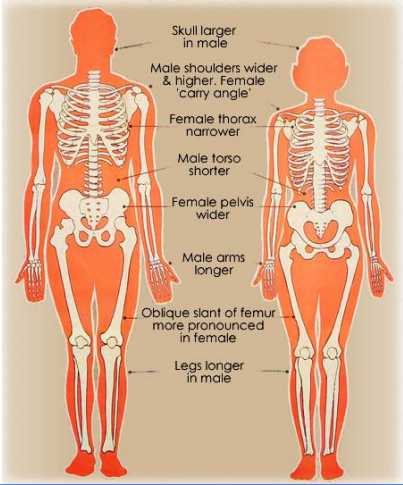
User Behaviour- The way that women and men use a system or think about a situation can differ. Their preferences for system interaction may also differ e.g. women prefer different map layouts than men.

Some Gender Considerations for your research

Technology and Equipment- Technology or equipment may not work equally well for men and women e.g. mascara can interfere with eye tracking equipment (Duchowski, 2003; Hassoumi, et al., 2019), females are more prone to simulator sickness or sickness from virtual reality (Flanagan, et al., 2005; Koslucher, et al., 2015; Keshavarz et al., 2018), earring use with headphones, hair bands with helmets.

Mobility Needs- The requirements that men and women have to travel vary. Men are more likely to use a car than females and drive longer distances. In London, women are less likely than men to have a full driving licence (58% women, 72% men) (TFL, 2019). Women are more likely to walk so more likely to suffer from air pollution (Mums4Lungs).

Ergonometric Standards- Women and men are different on average in height, size, weight, body composition and this effects concepts such as reach and clearance (FPFW, 2017; U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, 2021).



Perceived Safety and Security- Gender impacts on the requirements for security and perceptions of safety. Females have more constrained travel patterns as they have a greater fear of their personal security.

This is sensitive to different times of the day and the presence of other travellers. The use of public transport (e.g. train, or bus) and walking alone at night is perceived as less safe and therefore less attractive to female travellers. They are more likely to take a taxi or drive as they are less exposed to potential offenders (Stark & Meschik, 2018; Ceccato & Pas, 2017).

To reduce their personal risk when walking at night women stick to well lit areas (Schmucki, 2012), take lengthy detours, talk on the phone, clutch their keys, and wear comfortable shoes in case they need to run (Campbell, 2021).

Source: www.theguardian.com/uk-news/2021/mar/10/women-tell-men-how-to-make-them-feel-safe-after-sarah-everard-disappearance

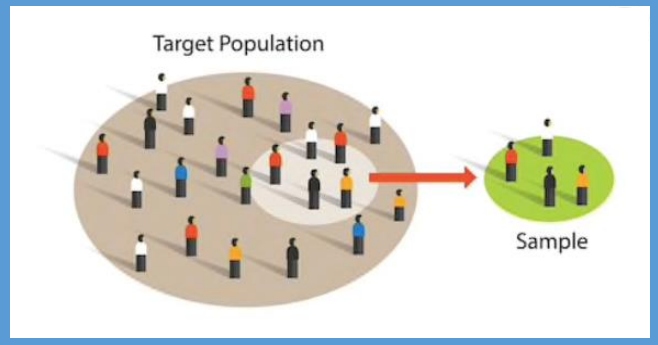
Exercise: Activity Two

What are the gender factors in your domain?

Mostly male Subject Matter Experts

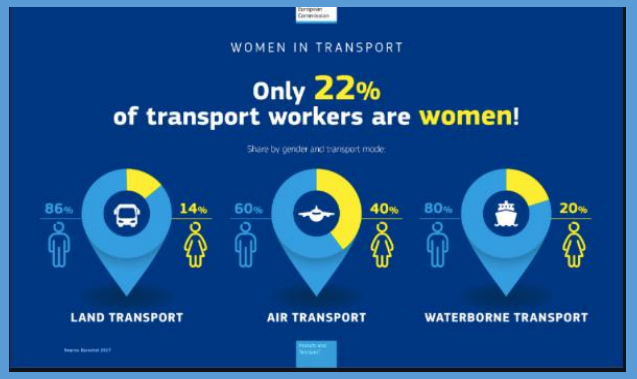
Designed for males

How can research result in a Gender Data Gap?



Unrepresentative Sample

Until 2011, used a male model to represent all drivers in crash testing.



Under-represented in Domain

Globally, females hold between 12.1% and 24.7% of the jobs in the automotive manufacturing industry (Catalyst, 2020).

Unintentional Bias

Introduced facial, internal organ and brain modelling before a female and larger male model. They may have believed that the male model was suitable for all drivers.

Aggregated Data

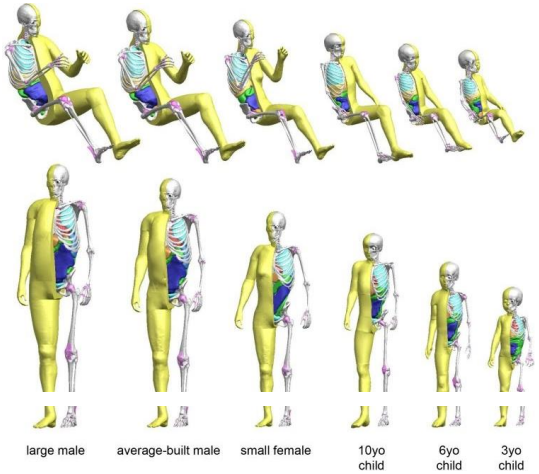
Could not investigate gender differences because only used male model.

Inaccurate reporting

Manufactures say that their vehicles have been crash tested and are safe for all drivers.

How easy can this happen? Lets take an example:

THUMS- Total Human Model for Safety



Exercise: Activity Three

What causal factors can you identify in your research?

Unrepresentative Sample – Mostly male Subject Matter Experts

Aggregated Data – Everyone is expected to be completing the same tasks

What can you do to close the Gender Data Gap in your Research?

- Think about gender during every stage of your PhD
  - 6 generic stages

Proposal	Review / Assess	Design	Data Collection/ Test	Analyse	Report
Deciding what the project is going to be about.	Review of literature, studies, systems, designs, machines, tools or software that has been created.	Designing a study, system, software, interface, machine equipment, tool, survey or observation study.	Testing what has been designed e.g. by using simulation, modelling, conducting a study/experiment or carrying out the observation.	Analysing the data collected.	Reporting the whole process (e.g. the results, documentation needed)

N.B. These research stages are generic. Your PhD may not involve all these stages. Additionally, some stages involved in your PhD may be missing from this diagram. You can tailor these stages to your PhD.

Exercise: Activity Four

How will you address gender equity in your research?

Design – Aim for representative gender split

Report – Report gender differences, if any

What can you do to close the Gender Data Gap in your research?

- Collect gender demographic information in your research

☐ Female
☐ Male
☐ Non-Binary
☐ Prefer not to say
☐ Prefer to self-describe……

Source: Stonewall (2019)- DO ASK, DO TELL: Capturing data on sexual orientation and gender identity globally

What can you do to close the Gender Data Gap in your research?

Research Stage	Example Best Practice
Writing proposals and review of previous work	• Include input from men and women to ensure research is addressing needs of target population. • Check literature justifying research focus is based on gender representative samples. • Does previous research show that gender differences exist? If yes, why do these differences exist? If no, did they look for gender differences? Identify whether gender differences are expected. • Survey/question both men and women to identify gender-related problems with previous iteration/product (e.g. system, design, machine, tool or software).
Design (e.g. studies, products, systems, tools, surveys, observations)	What gender considerations do you need to take into account when designing your study, product, machine, tool, interface, observation? • Design products and write documentation which are suitable for both men and women (take into account gender differences in height, weight, size, medical conditions etc) e.g. make sure touch buttons are big enough for the male finger, make sure females can reach the machines. • In studies, plan for representative samples, recruit sufficient numbers for statistical significant gender disaggregation (if using inferential stats) and use tech & equipment that works equally well for males/females or have back-up plans if this is not possible (e.g. recruit more females to account for simulator sickness, use video recording software in case the eye-tracker does not work) • When designing an observation, plan for representative samples (rather than convenience sampling), recruit female and male observers and choose days, times and places where you can observe male and female participants (e.g. not at night or in the dark).

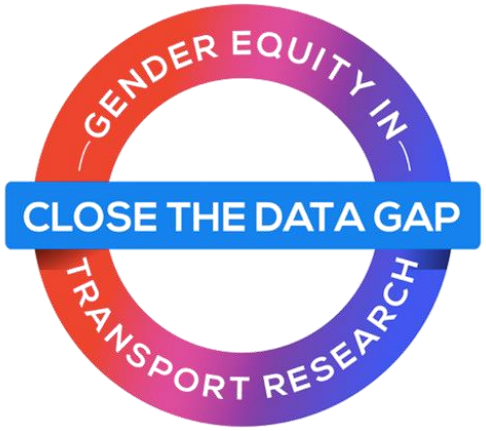
What can you do to close the Gender Data Gap in your research?

Research Stage	Example Best Practice
Data Collection/Test	• Always collect gender demographic information in your research (see previous slide). • If conducting a study, use gender friendly procedures, have flexible time slots, buffer to ensure gender targets can be met and pilot with mix of attendees. • If using simulation, test using both male and female dimensions (e.g. weight, height). • If conducting user trials, use a representative sample of both males and females. • If conducting an observation, observe an equal number of male and female participants and ensure sufficient time is allocated to the observation so that a representative sample of males and females can be observed (rather than relying on convenience sampling). • If modelling data, who is represented in your data? Are you modelling scenarios that represent both men and women's experience?
Analyse	• Gender disaggregate- investigate the differences between males and females (higher samples if not gender balanced). • When analysing and interpreting observation data, ensure male and female assessors analyse the data and conduct inter-rater reliability assessments using male and female assessors.
Report	• Clearly specify number of participants by gender (and other key demographics), number of dropouts by gender and justify reasons if males/females are excluded or if no gender analysis was done. • Specify generalizability of results based on actual sample/tests conducted. • Identify implications of gender on the study results/analysis. • Highlight further work for broader generalizability. • Highlight significant gender differences/null results, in summaries/abstracts/conclusion.

Activity Five: Reflection

What will you Start, Continue, and Stop doing?

Questions & Feedback



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@CloseTheDataGap