SPA 2021 – Team Project Research Awards Sponsored by McMaster Institute for Research on Aging

12 teams will present their CIHR CLSA Catalyst Grant proposal on May 12 to a panel of judges.

The top 4 scoring teams will be recognized and offered a **SPA 2021 Research Award** to support developing their proposal into a CLSA research project, including submitting a request for data to the CLSA.

Each award will consist of:

- **$3000 to cover the cost of CLSA data access**
  - As these projects will run *outside* of trainees' thesis projects, trainees would not be eligible for a trainee fee waiver.
- **$500 research stipend** for each trainee who wish to pursue the research project after SPA
  - Students will receive the stipend after submitting the data request to CLSA (**deadline: September 8, 2021**).
  - It is not required that all trainees from a selected team agree to participate; only those who contribute to the data access request will qualify for the $500 stipend.
  - Trainees must email application number and names of members of team to Roxanne Cheeseman as a proof of submission.

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SPA 2021 – Team Project Research Awards

Further Considerations:

- Trainees' supervisors must be agreeable to support each participating trainee's request for data access

- If request for data is approved, data will be available in spring 2022

- Successful teams should connect with Roxanne Cheeseman to determine how to move the application forward

- Teams and mentors may submit questions about the awards to Audrey Patocs, patocsae@mcmaster.ca

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Introduction to Longitudinal and Cohort Studies in Aging

MIRA

#AgingReimagined

Dr. Parminder Raina, FCAHS
Scientific Director
McMaster Institute for Research on Aging
Lead PI, Canadian Longitudinal Study on Aging
Professor
Department of Health, Evidence & Impact
Canada Research Chair in Geroscience
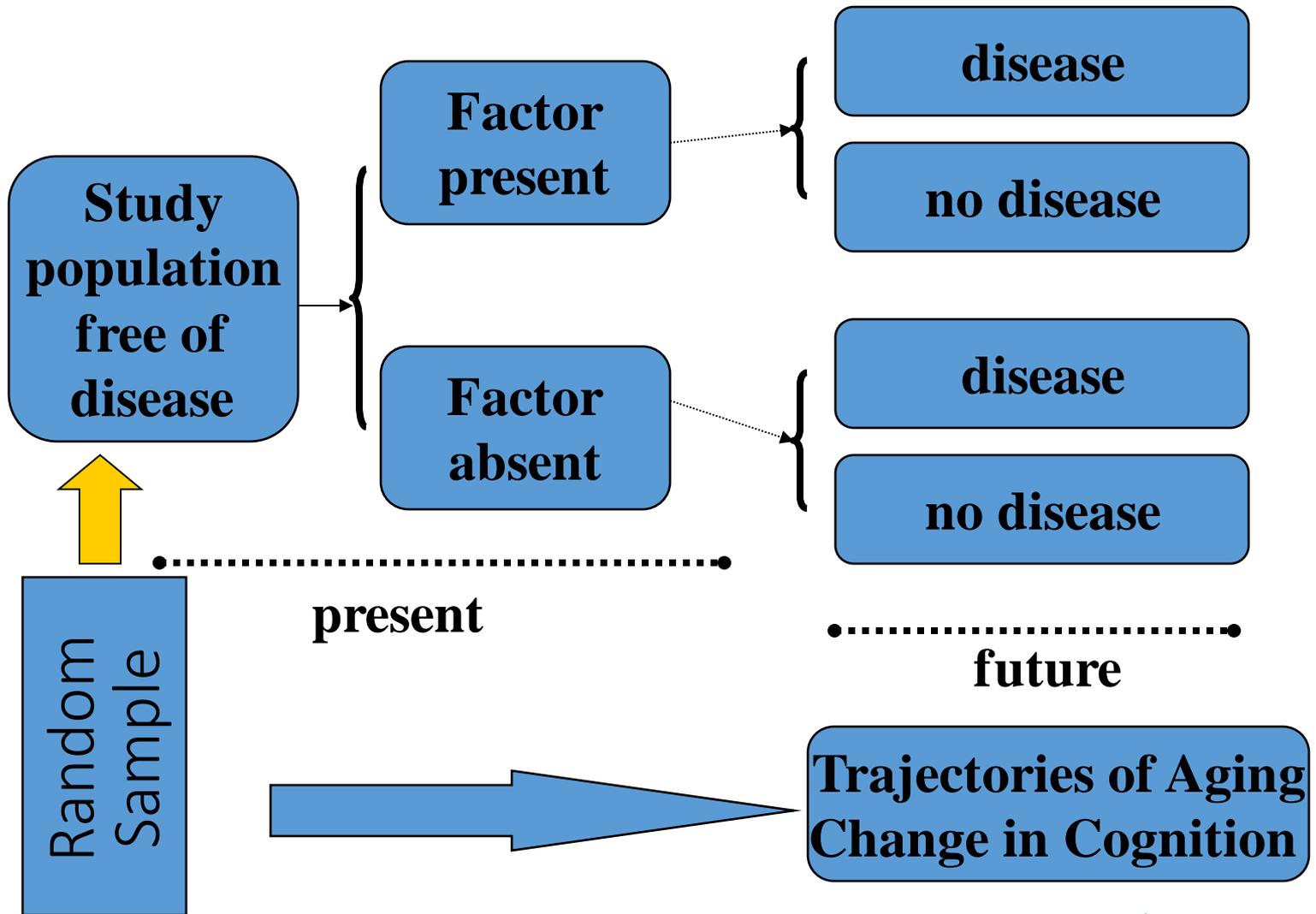*Labarge Chair in Optimal Aging*

CLSA

@clsa-elcv

Panel Longitudinal/Cohort Design

Study population free of disease

Factor present
→ disease
→ no disease

Factor absent
→ disease
→ no disease

present

future

Random Sample

Trajectories of Aging Change in Cognition

Study begins here   time

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Longitudinal Studies that collect data at Micro/individual Level

- Longitudinal studies in the health and social sciences tend to consist of:
    - many participants (usually thousands)
    - large number of variables
    - fewer occasions (e.g. household contacted yearly)

SOME METHODOLOGICAL ISSUES

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Four Methodological Issues

- Age, Cohort & Period Effects
- Direction of Causality
- State Dependence
- Residual Heterogeneity

Age, Cohort, Period

- AGE = Amount of time since cohort was constituted.

- COHORT = A common group being studied.

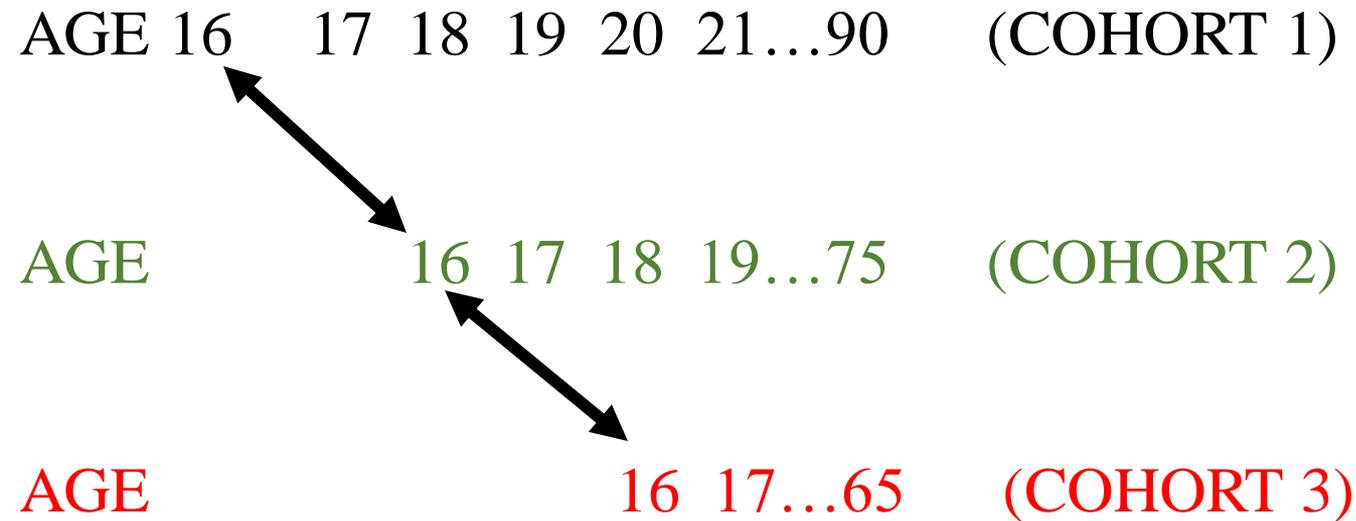- PERIOD = Moment of observation.

THREE AGING COHORT STUDIES

→

AGE 16   17 18 19 20 21…90   (COHORT 1)

AGE   16 17 18 19….75   (COHORT 2)
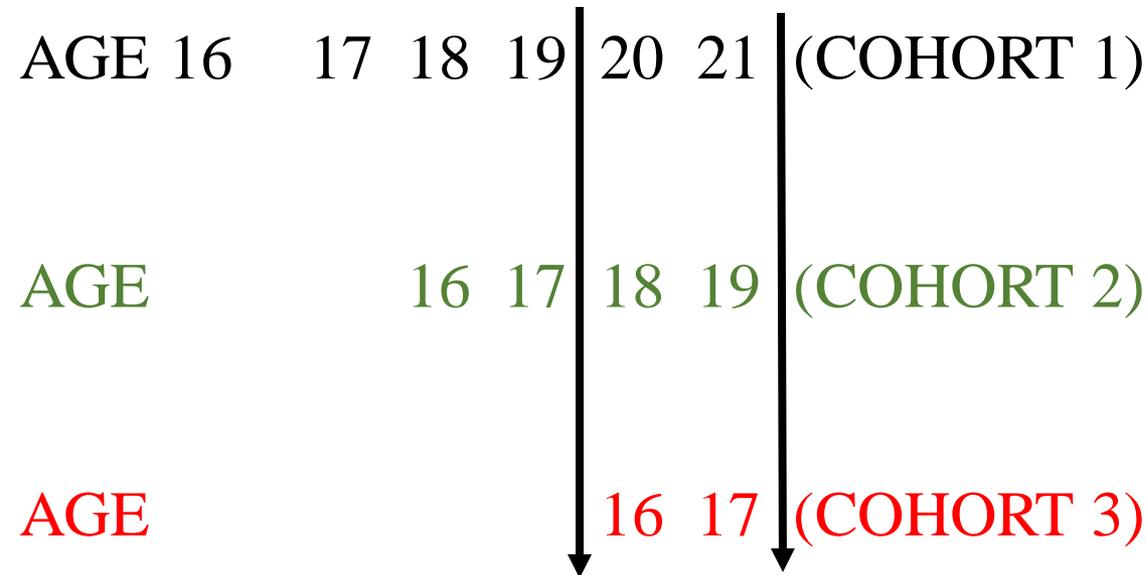
AGE   16 17…65   (COHORT 3)

We can study the effects of 'age' or aging.

THREE AGING COHORT STUDIES

AGE 16   17 18 19 20 21…90   (COHORT 1)

AGE   16 17 18 19…75   (COHORT 2)

AGE   16 17…65   (COHORT 3)

We can study the effects of cohort.

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THREE AGING COHORT STUDIES

AGE 16   17 18 19 | 20 21 |(COHORT 1)

AGE   16 17 | 18 19 |(COHORT 2)

AGE   16 17 |(COHORT 3)

Period of low   Period of high
unemployment   unemployment

We can study the effects of period.

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Pooling cross-sectional datasets can help us begin to unravel period and cohort effects.

In most cases even with pooled cross-sectional data it is still not conceptually straightforward to disentangle the effects of aging from period and cohort effects.

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Direction of Causality

- There is unequivocal evidence from cross-sectional data that, overall, the unemployed have poorer health.
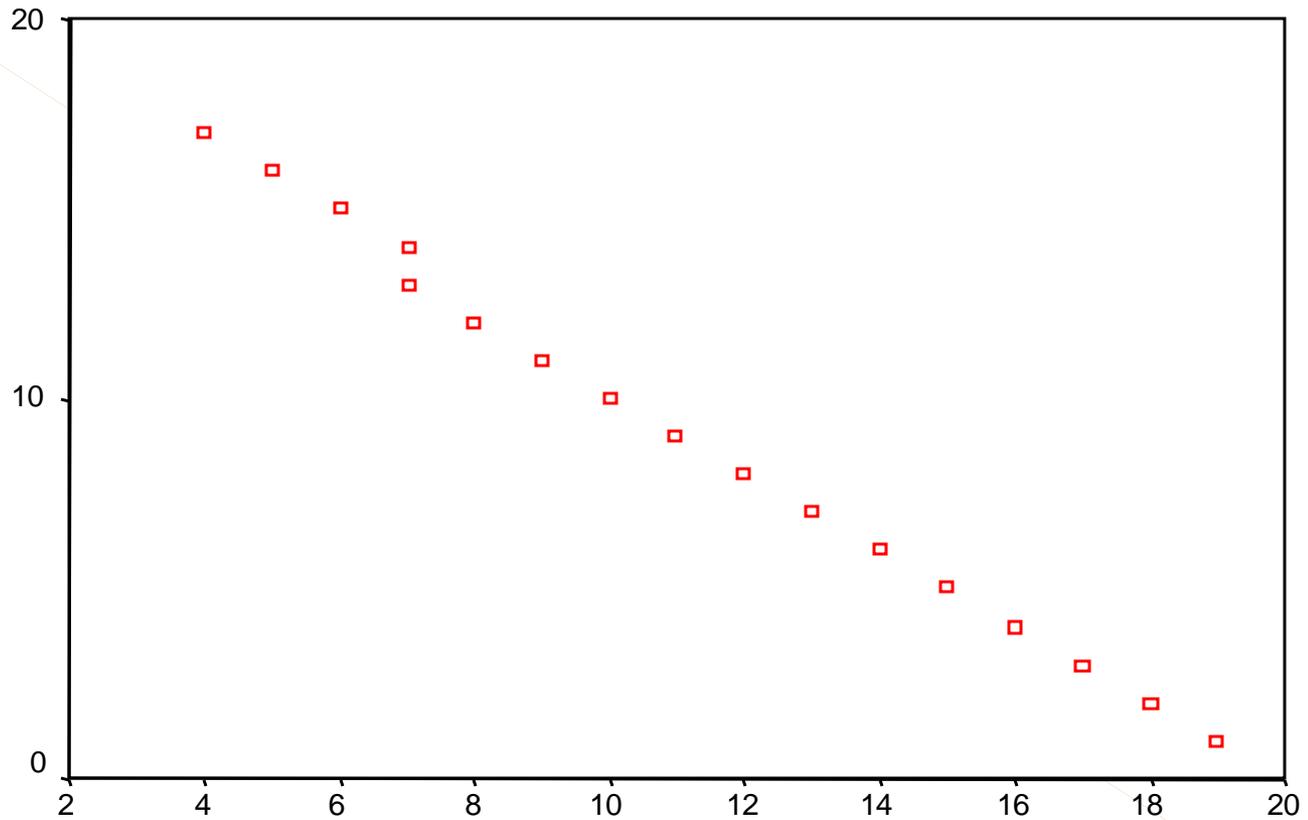
This is consistent with both

a) unemployment causing ill health

and

b) ill health causing unemployment

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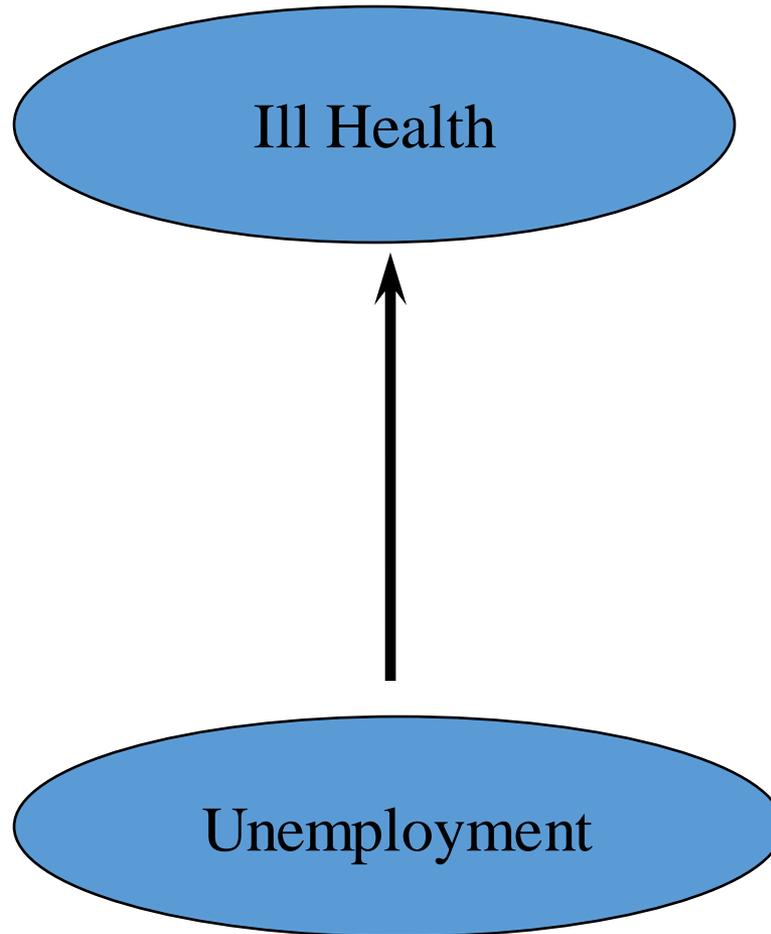Research on Aging

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If we had a cross-sectional survey that asked how long people had been unemployed and also their level of health, generally, we would find a negative relationship.

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This is consistent with
a) unemployment causing ill health

HOWEVER………….
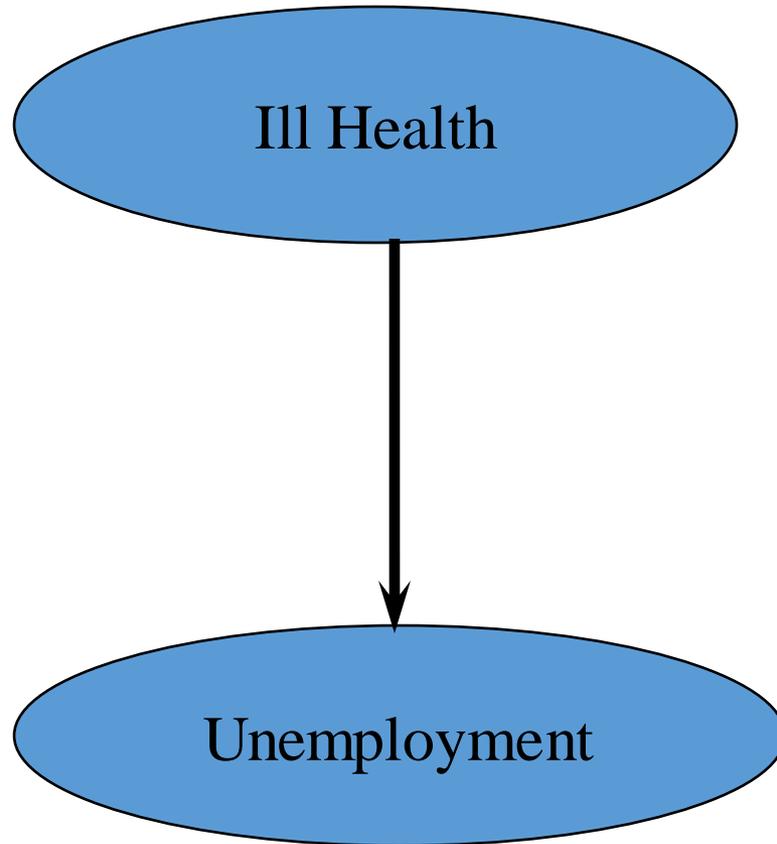
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If ill health causes unemployment…

then people with comparatively modest levels of ill health will tend to recover more quickly and return to work.

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consistent with
b) ill health causing unemployment

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With the increasing duration of unemployment those with less severe ill health will be progressively under represented while those with more severe ill health will be over represented.

This is known as a 'sample selection bias' and could therefore explain the cross-sectional picture of declining ill health with duration of unemployment.

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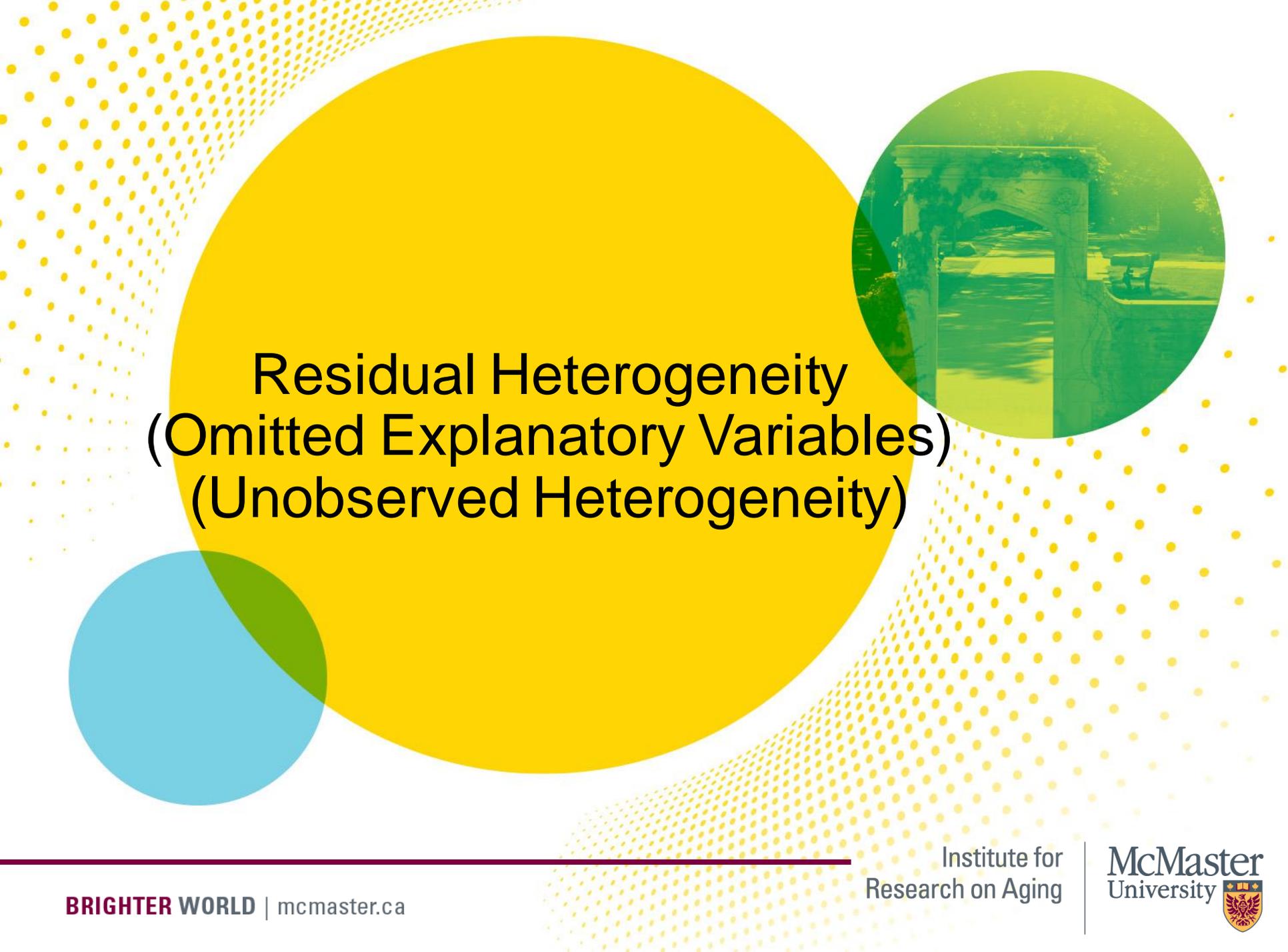Research on Aging

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It is not possible to untangle this conundrum with cross-sectional data.

Longitudinal data are required!

State Dependence

- Previous behaviour affects current behaviour

- History of depression affects your current depressive symptoms

- Work in May – more likely to be in work in June.

- Married this year more likely to be married next year.

- Own your own house this quarter etc. etc.

- Travel to work by car this week etc. etc.

- PANEL LONGITUDINAL STUDY IS REQUIRED

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Residual Heterogeneity
(Omitted Explanatory Variables)
(Unobserved Heterogeneity)

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The possibility of substantial variation between similar individuals due to unmeasured and possibly unmeasureable variables are known as 'residual heterogeneity'.

There is no way of accounting for omitted explanatory variables in cross-sectional analysis.

As long as we make the assumption that (at least some of) these effects are enduring there are techniques for accounting for omitted explanatory variables if we have data at more than one time point.

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Residual Heterogeneity
(Omitted Explanatory Variables)
(Unobserved Heterogeneity)

- Longitudinal studies are an improvement on cross-sectional

- Longitudinal studies will improve control for residual heterogeneity

- Longitudinal data analysis models will help to provide a measure of the residual heterogeneity

Conclusions

- For some research cross-sectional data are ok.

- Many studies will have value added by using panel data (better estimates; age/cohort/period/ effects; state dependence; residual heterogeneity).

- For some studies panel data are essential (e.g. Studying change).

- For some studies cohort studies are essential to understand the association between risk factor and disease

OVERALL MESSAGE

When one uses data from longitudinal studies such as CLSA
- Think about the design of the study
- Think about unit of sampling and sampling methods
- Think about unit of analysis
- Think about sample size
- Think about measurement issues and Quality of Data
- Think about attrition related biases
- Think about generalizability of the data
- Think about nature of missing data
- Think about unequal follow-ups
- Think about relevance of study and your results
- Think about whether you are trying to study changes at the population level or changes at the individual level

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