

Part I: Introduction to empirical research methods and applications

Part I

- Type of empirical methods
- Validity types
- Data types (data collection, measurement)
- Exploratory data analysis
- Visualization
- Ethical principles

- In other words...
 - Why do we care about data analysis?

References for this part

- Hoyle, R. H., Harris, M. J., & Judd, C. M. (2002). Research methods in social relations. Thomson Learning.
- The Visual Display of Quantitative Information (2nd Edition). E. Tufte. Graphics Press, 2001.
- Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2011). False-positive psychology undisclosed flexibility in data collection and analysis allows presenting anything as significant. *Psychological science*.

Empirical research methods

- Type of empirical methods
 - Purely descriptive studies
 - Studies of correlations
 - Studies claiming a causal relationship
 - Experimental vs. non-experimental research
 - An intervention is implemented (hopefully using random assignment) to cause a hypothesized change to an outcome variable
 - Observational data without experimental intervention by the researcher
- Let's see examples/applications...Are these true?...

Applications

>> Promedio de hijos por mujer en edad fértil según grupo de edad. Censo 2002 y 2012

Fecundidad: estudio de la frecuencia de los nacimientos de hijos vivos, en relación a las mujeres en edad fértil, esto es, con edades entre 15 y 49 años.



Grupo de edad	Promedio de hijos por mujer en edad fértil	
	Censo 2002	Censo 2012
Total País	1,59	1,45
15 a 19 años	0,20	0,37
20 a 24 años	0,64	0,65
25 a 29 años	1,21	1,07
30 a 34 años	1,82	1,56
35 a 39 años	2,27	2,02
40 a 44 años	2,57	2,32
45 a 49 años	2,77	2,47
Promedio de hijos por mujer para grupo de edad de 50 años o más		
50 años o más	3,70	3,20

Applications cont'd

LAS ESTADÍSTICAS LO DEMUESTRAN

Si quiere que su hijo sea un buen futbolista, que no nazca en diciembre

Las estadísticas dejan claro que los niños que nacen los primeros meses del año tienen más opciones de acabar siendo buenos futbolistas



Applications cont'd

LATERCERA

Nacional

Crecen delitos cometidos en la vía pública entre las 6 y 8 horas

Diputados y un experto en seguridad atribuyen índice a la oscuridad generada por no cambiar el horario de verano.

Victor Rivera, Santiago / 21/06/2015 - 04:31

314      48 [uri http://fw.to/CnNV0ba](http://fw.to/CnNV0ba) -A +A



“De acuerdo a los datos entregados por Carabineros, en 2014 se produjeron 1.418 de estos delitos en el período consultado, en tanto, este año se han registrado 1.750 de estos ilícitos. En consecuencia, hubo un aumento de un 23,4%”.

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Applications cont'd

- Example (specifically from 5:00-7:00)

Gendarmería se defiende tras críticas por el otorgamiento masivo de libertad condicional a presos

por EL MOSTRADOR | 2 mayo 2016



What do you think? Who is right?

"La postulación al mencionado beneficio es un derecho del interno, sin embargo, la decisión es tomada por la Comisión de Libertad Condicional de cada Corte de Apelaciones a lo largo del país", señaló la institución por medio de un comunicado.

Gendarmería de Chile respondió ante la entrega de más 1500 libertades condicionales a lo largo de todo el país.

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Applications cont'd

Fútbol | Tenis | Tuerca | Polideportes

Ex propietario encontró al "culpable" del descenso de Fulham: Michael Jackson

Según Mohamed Al Fayed, el retiro de la estatua del fallecido cantante del estadio provocó que el equipo perdiera la categoría en Inglaterra.

por EFE - 08/05/2014 - 07:09

Me gusta 15 | Twittear 7 | Compartir 0 | LinkedIn 0 | + 22

La estatua de Michael Jackson fue retirada por el actual propietario de Fulham.

PRECIO LANZAMIENTO TURBO DIESEL DESDE: \$12.590.000

PA POR UN PEONATO NA 2015

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Applications cont'd

The New York Times

Ebola Victim's Journey From Liberian War to Fight for Life in U.S.

New York City Steps Up Preparations to Be Ready for Ebola Cases

Offering Help and Ebola Epidemic Un

University of Phoenix

Did you know? Only 1% of Americans hold degree. Join a distinguished

Well

FAMILY

Helmets Do Little to Help Moderate Infant Skull Flattening, Study Finds

By CATHERINE SAINT LOUIS MAY 1, 2014 9:37 PM 104 Comments

EMAIL | SHARE | TWEEET | SAVE | MORE

Pediatricians have long urged parents to put newborns to sleep on their backs to help prevent sudden infant death syndrome. While the practice undoubtedly has saved lives, it also has increased the numbers of babies with flattened skulls.

Roughly one baby in five under the age of 6 months develops a skull deformation caused by lying in a supine position. Now a study has found that a common remedy for the problem, an expensive custom-made helmet worn by infants, in most cases produces no more improvement in skull shape than doing nothing at all.

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Well

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What do we expect?

- Conduct empirical research or systematic observation, to support/challenge theories and hypotheses

- We would like to achieve:

A causes B for population X under condition Y.

- Examples:

- Contact with members of other ethnic groups decreases prejudice in equal status settings
- The social class of one's parents has a strong effect on one's aspirations in our society
- Crowded classrooms in urban areas adversely affect educational achievement

Some criteria to evaluate the validity of the hypotheses

- Construct validity: Whether variables accurately reflect or measure the construct of interest
- Internal validity: Whether conclusions can be drawn about the causal effects
- External validity: Whether results are generalizable to the populations and settings of interest



Example...

Based on Hoyle, R. H., Harris, M. J., & Judd, C. M. (2002)

Maximizing validity

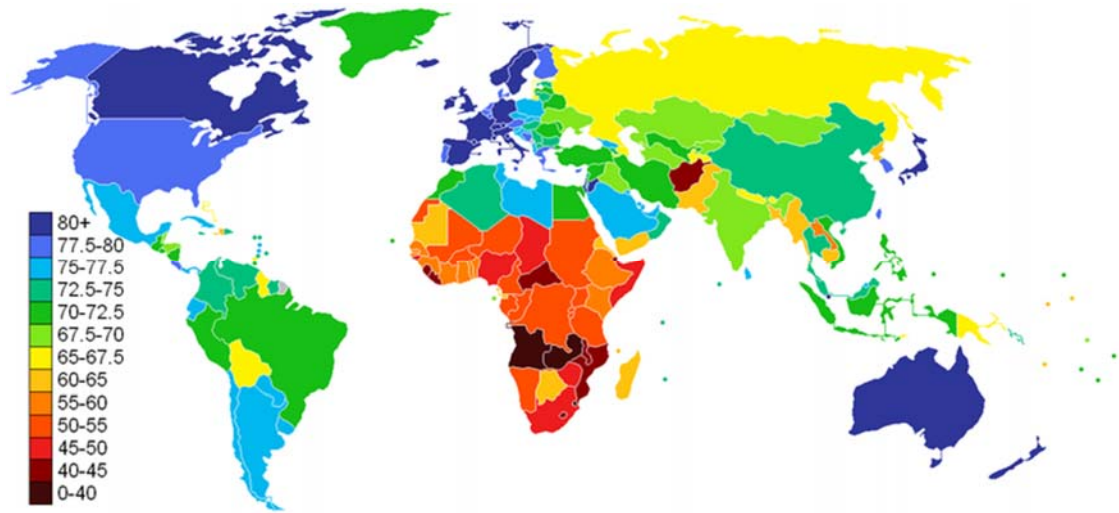
- **Construct validity**
 - Incorporate additional variables that measure the same construct (i.e. measure in different ways and check for similar results)
- **Internal validity**
 - Randomized experiments and quasi-experiments. We will talk a lot about this
 - Does it matter to show the path of causality instead of association?
Yes. (e.g. watching violence on TV and aggressiveness in children)
- **External validity**
 - Precision
 - Random sampling

Question: Is random sampling the same as random assignment?

Types of data: Organization

- **Cross-sectional data**
 - Subjects (people, households, firms, countries, etc.) are observed at a point in time (or time is not considered)
 - Example: Experiments (treatment vs. control)
- **Time series**
 - Observation over time (e.g. trends and seasonality)
 - Daily, weekly, quarterly, etc.
 - Example: exchange rate and stock prices
- **Panel**
 - Subjects are observed over time (combines features from cross-sectional and time series)
 - Example: EPS (Chile)

Applications

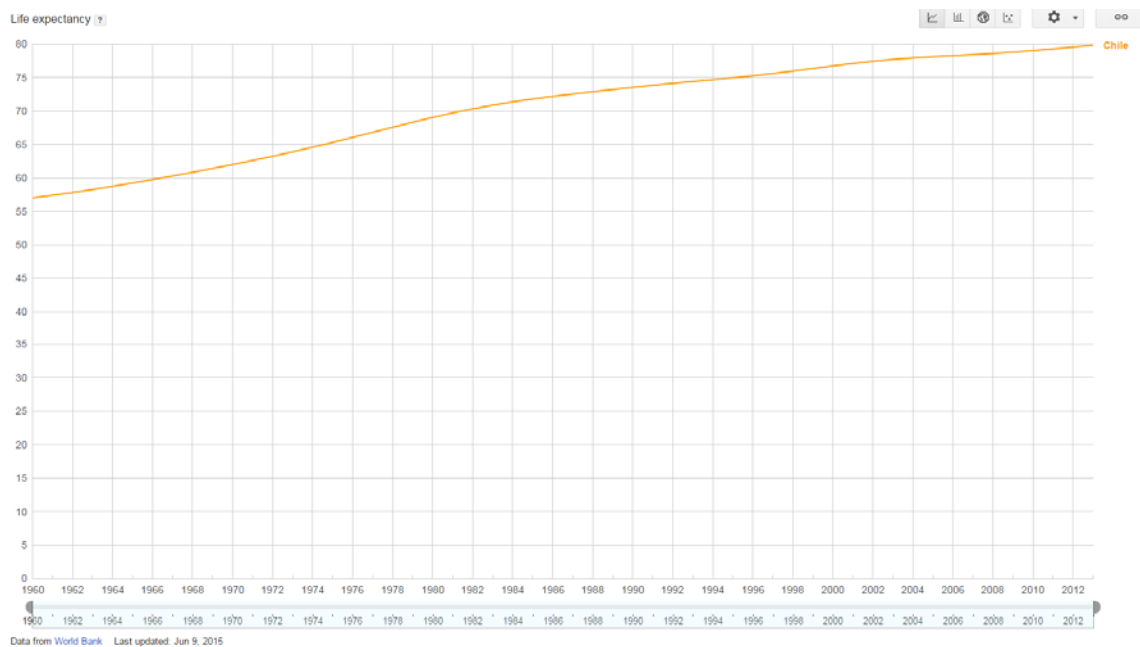


<http://coolsciencenews.blogspot.com/2011/11/us-ranks-28th-in-life-expectancy.html>

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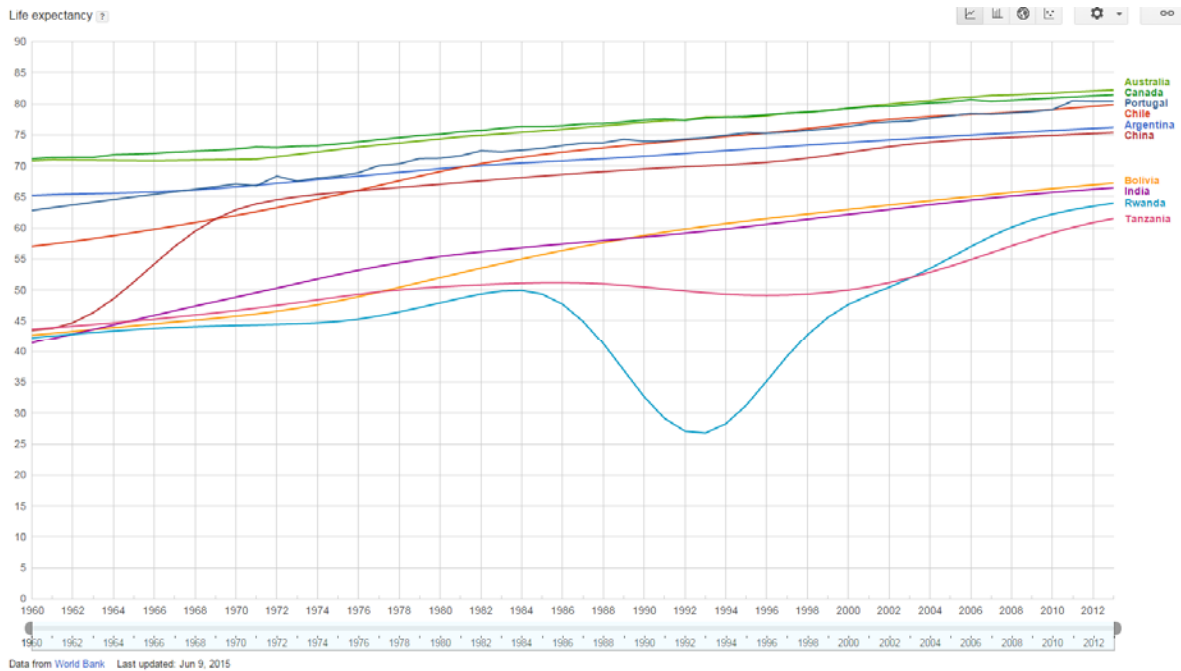
Applications (cont'd)



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Applications (cont'd)



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Types of data: Modes of measurement

• Qualitative data

- Interviews
- Focus groups
- Mental models

¿Advantages and disadvantages? ¿How can we use this type of data for quantitative purpose?

• Quantitative data

- Direct questioning (telephone / face-to-face / online survey)
- Observation (e.g. video taping)
- Experiments
- Administrative data

¿What are some of the threats of conducting surveys?

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