

# **CULTURAL AND ECONOMIC INFLUENCES ON NATIONAL WORKPLACE INJURY RATES IN YOUNG PEOPLE**

**DR CHIN-KIAT TANG**





WHY?



YOUNG WORKERS HAVE HIGHEST INJURY RATES.

YOUNG WORKERS HAVE A LONG FUTURE WORKING LIFE.

LOTS OF RESEARCH ON MICRO LEVEL FACTORS, LITTLE ON  
MACRO LEVEL FACTORS.





CULTURAL FACTORS

SOCIAL NORMS

ATTITUDES

BELIEFS

(LUND AND AARO, 2004)

ECONOMIC DEVELOPMENT

(ÇOLAK AND PALAZ, 2017)

INJURY RATES  
IN ALL WORKERS

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graph LR; A[CULTURAL FACTORS  
SOCIAL NORMS  
ATTITUDES  
BELIEFS  
(LUND AND AARO, 2004)] --> C[INJURY RATES  
IN ALL WORKERS]; B[ECONOMIC DEVELOPMENT  
(ÇOLAK AND PALAZ, 2017)] --> C;
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The diagram illustrates two factors influencing injury rates in all workers. On the left, a list of cultural factors (Cultural Factors, Social Norms, Attitudes, Beliefs) is cited from Lund and Aaro (2004). Below this, Economic Development is cited from Çolak and Palaz (2017). Two white arrows originate from these two groups of text and point towards the right, where the outcome 'INJURY RATES IN ALL WORKERS' is displayed.



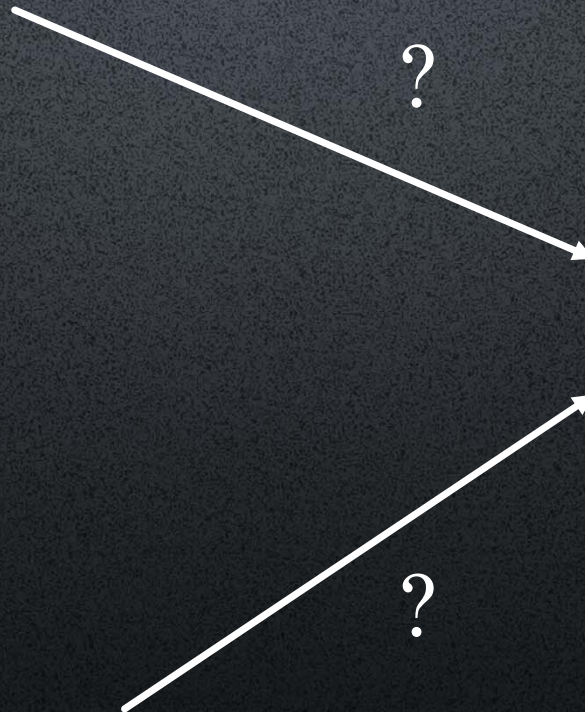
# RESEARCH QUESTIONS:

CULTURAL VALUES

SOCIETAL ATTITUDES



NATIONAL ECONOMY



INJURY RATES IN  
YOUNG WORKERS



# METHODOLOGY:

- DATA SOURCES:
  - WHO DATABASE - NON-FATAL WORKPLACE INJURIES AMONG WORKERS AGED <18 YEARS AND 18 - 24 YEARS FROM 1995 TO 2007.
  - WORLD VALUES SURVEY - PREVALENCE OF THE CULTURAL ATTITUDES TO YOUNG PEOPLE.
  - INDEX MUNDI DATABASE.
- STATA 14 STATISTICAL SOFTWARE PACKAGE.



## DEPENDENT VARIABLE:

- INCIDENCE OF NON-FATAL WORKPLACE INJURIES AMONG YOUNG WORKERS (PER 100,000 WORKERS IN THE AGE CATEGORY)

## INDEPENDENT VARIABLES:

- ATTITUDES TO YOUNG PEOPLE'S INDEPENDENCE
  - HARD WORK
  - FEELING OF RESPONSIBILITY
- COUNTRY OF RESIDENCE (10 COUNTRIES: FINLAND, FRANCE, GERMANY, ITALY, THE NETHERLANDS, NORWAY, SPAIN, SWEDEN, SWITZERLAND, THE UK)
- WORKERS' AGE CATEGORY: < 18 YEARS AND 18 – 24 YEARS
- YEARS 1995 – 2007
- COUNTRY'S GDP PER CAPITA (PURCHASING POWER PARITY)
- COUNTRY'S UNEMPLOYMENT LEVEL



## COUNTRY VARIABLE:

- FINLAND, THE NETHERLANDS, NORWAY, THE UK
- GERMANY AND SWITZERLAND
- ITALY
- FRANCE AND SPAIN
- SWEDEN

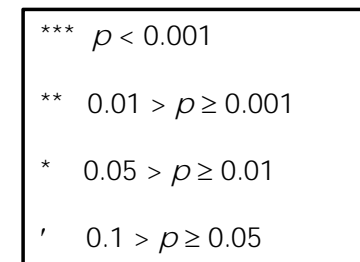


GENERALISED STRUCTURAL EQUATION MODEL (GSEM) –  
CHARACTERISE DIRECT AND INDIRECT EFFECTS OF MULTIPLE  
VARIABLES ON EACH OTHER AND ON THE DEPENDENT  
VARIABLE.

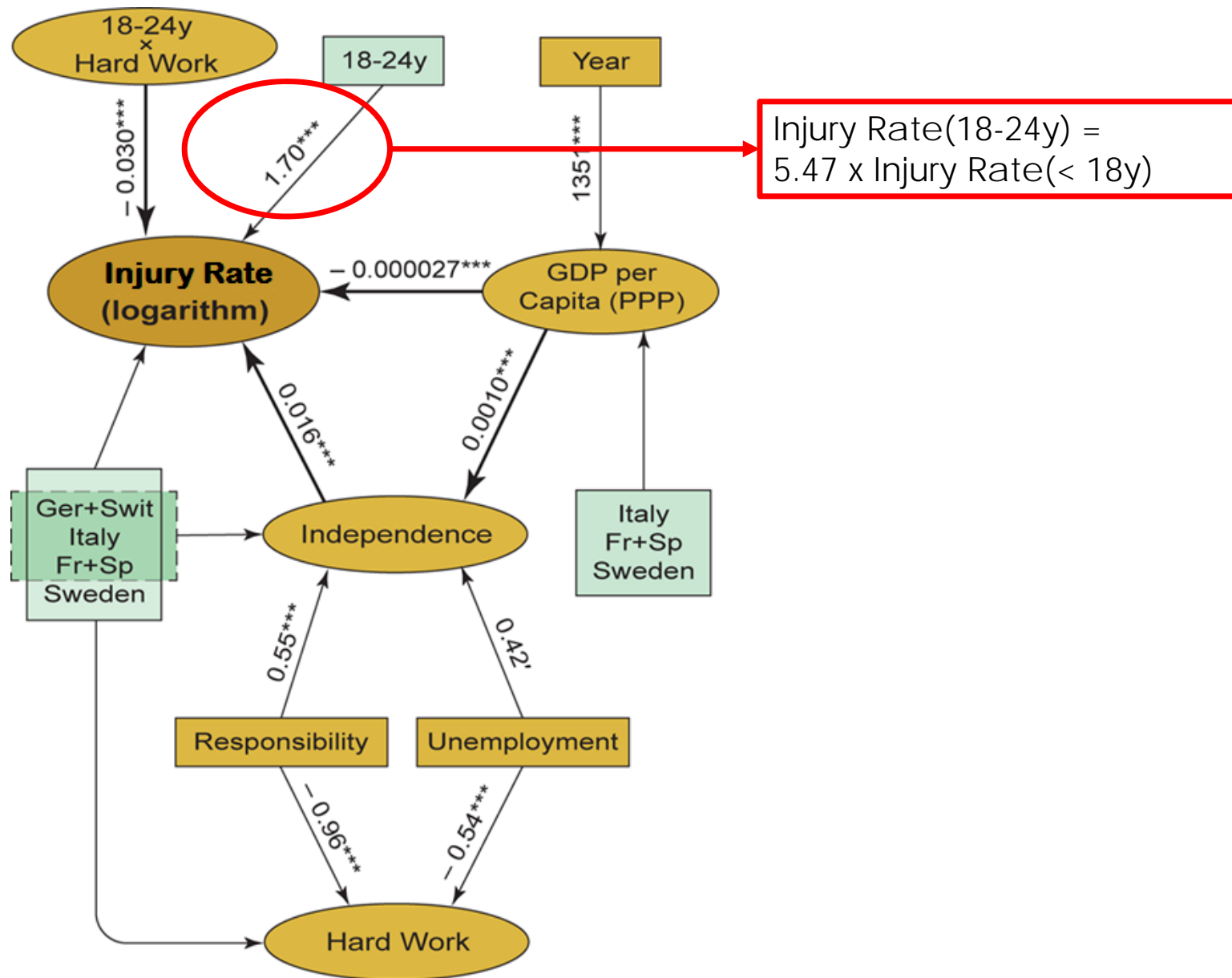
MODEL FIT –

LINEAR REGRESSION MODEL WITH MULTIPLE INDEPENDENT  
VARIABLES, USING STANDARDISED RESIDUALS.

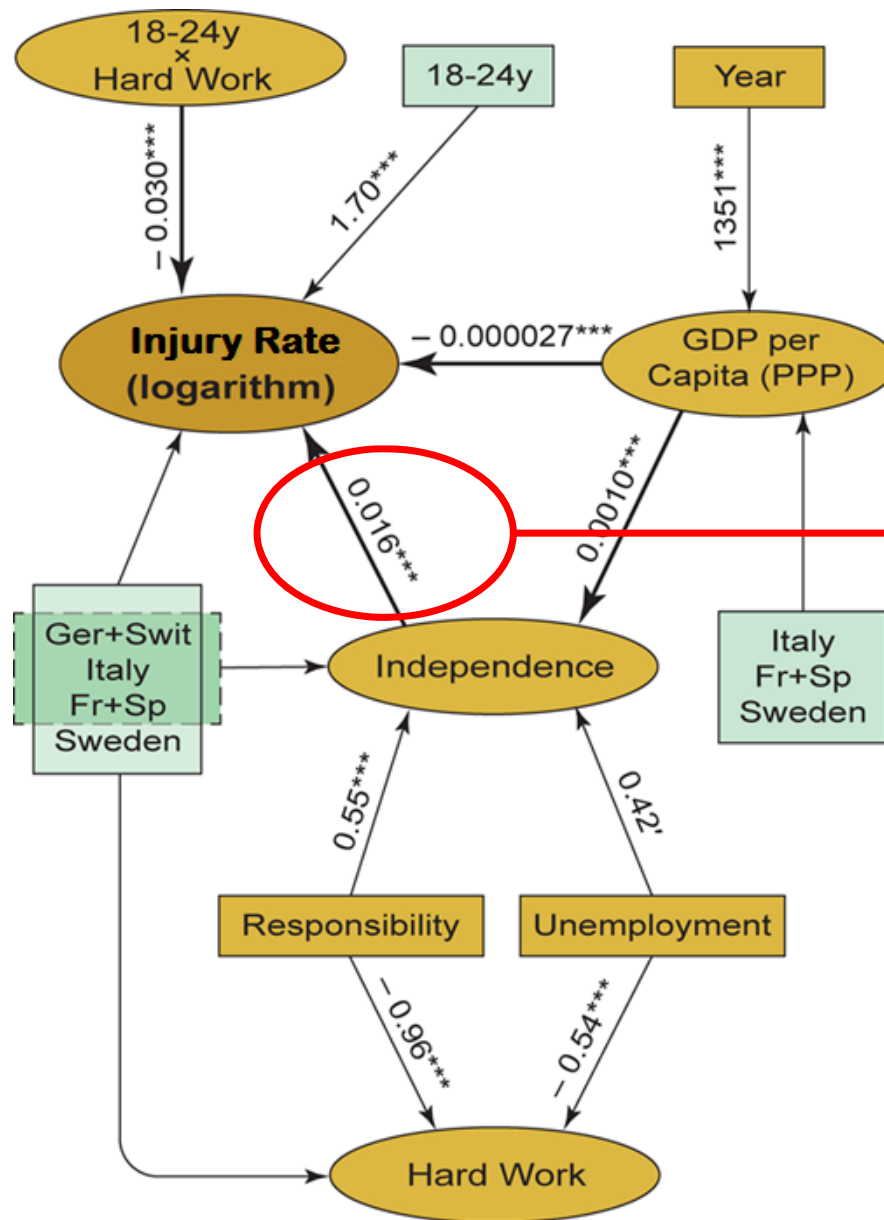






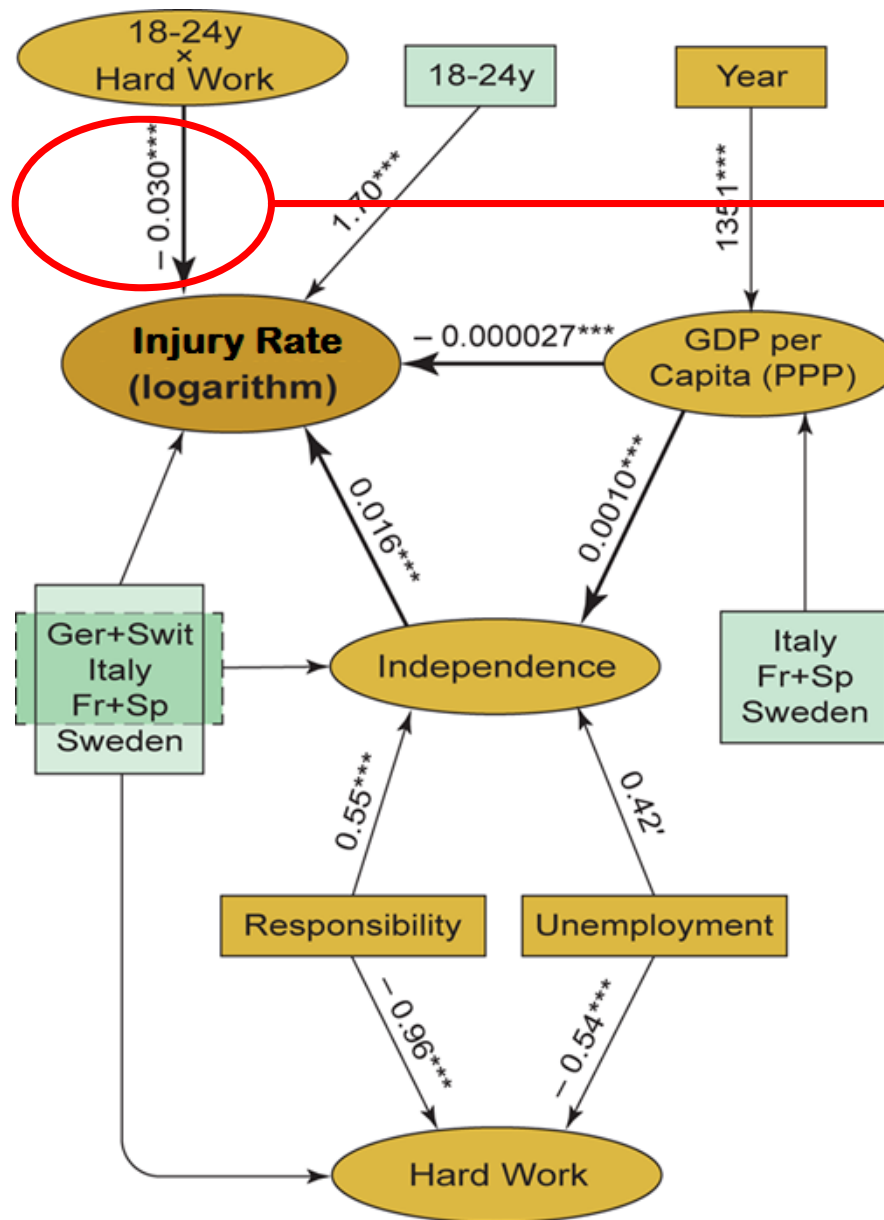






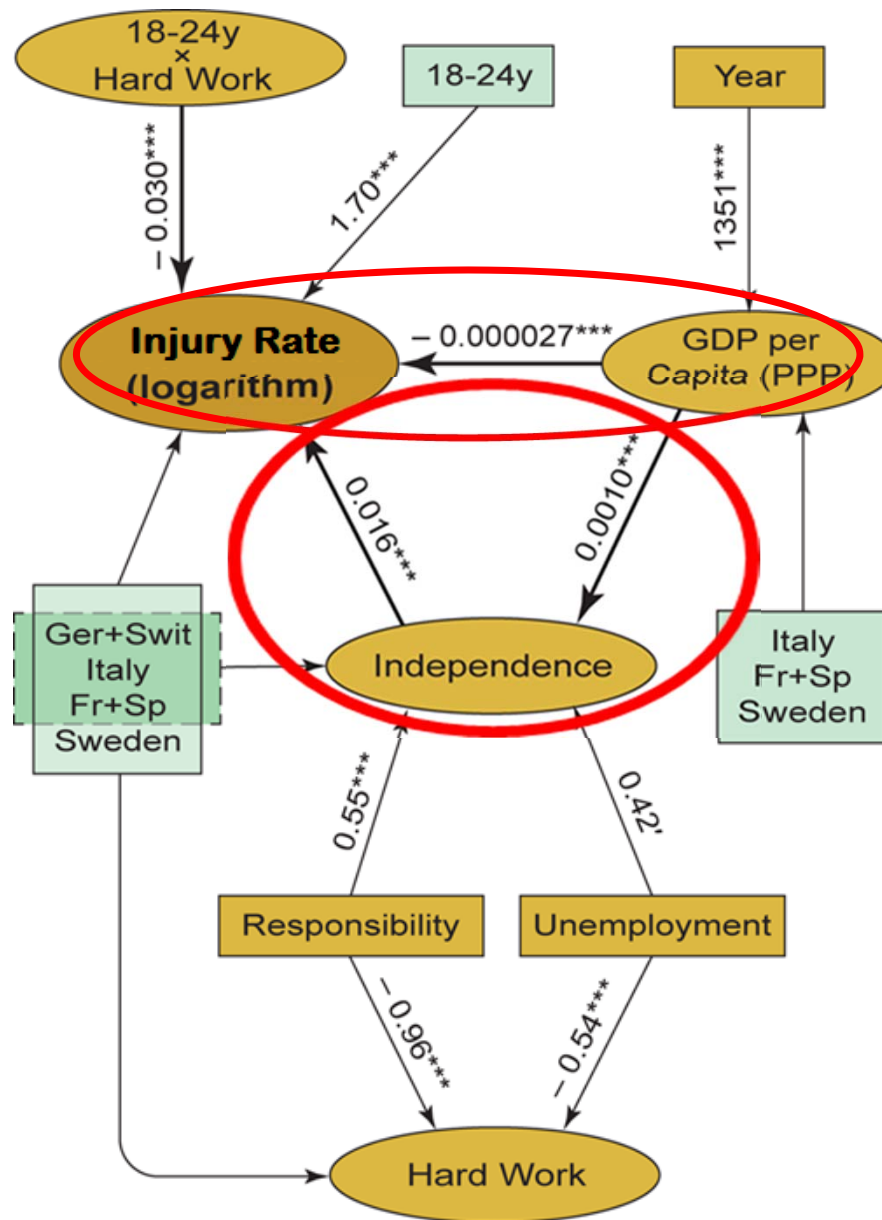
For every 10% of people who believe young people should be independent, Injury Rate increases by 16%





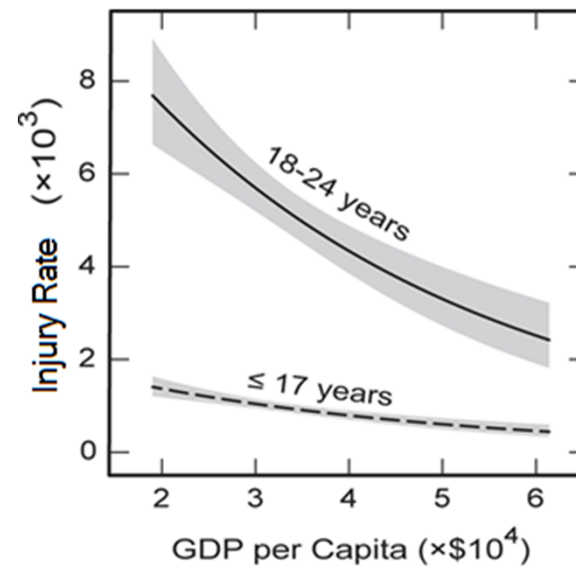
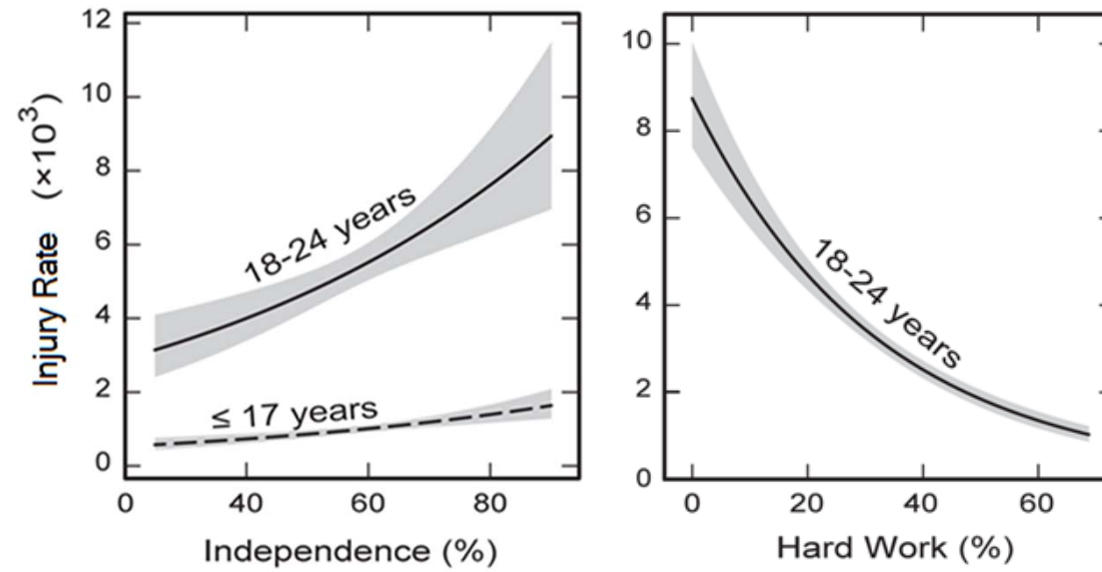
Increasing prevalence of the expectation that young people should be hard-working by 1% results in decreasing Injury Rate in the 18-24 years age category by 3.0%



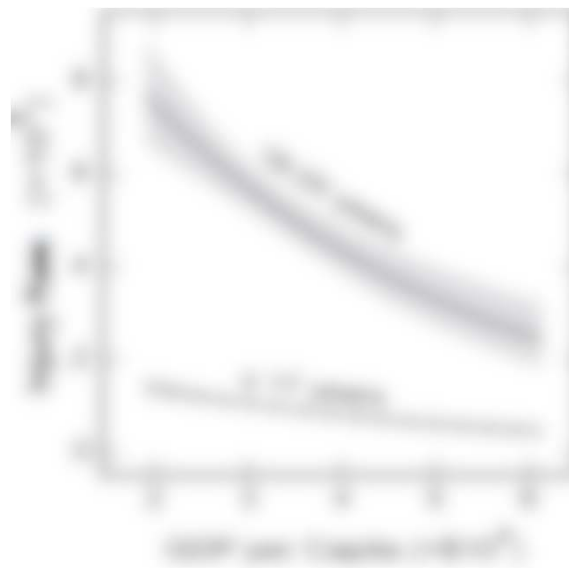
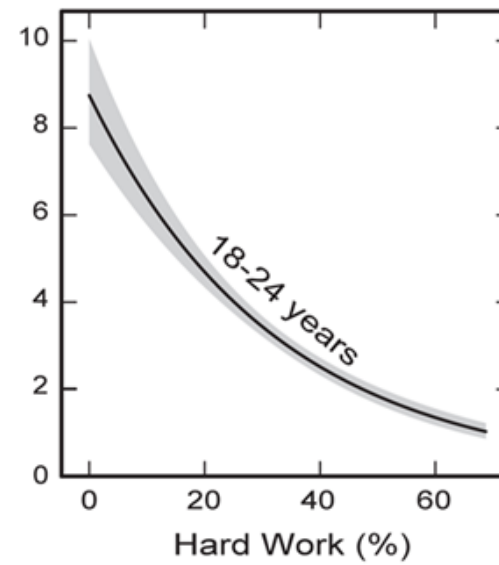
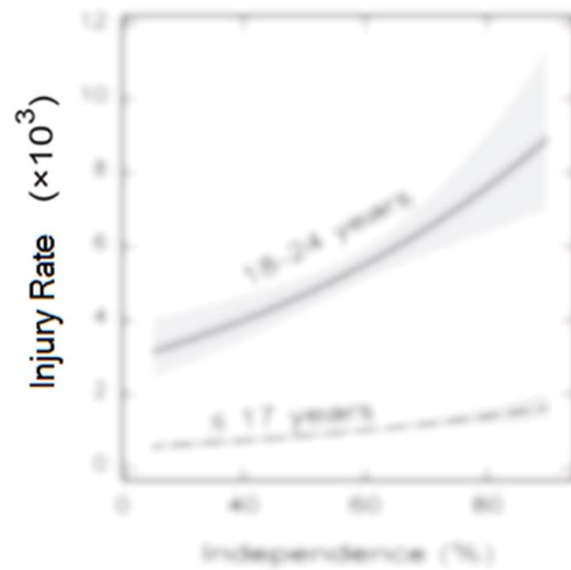


Increasing GDP per capita by \$1000 decreases Injury Rate by 1.1%



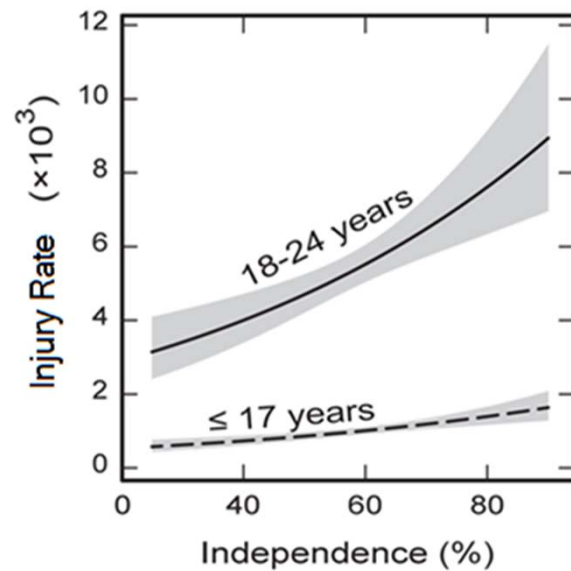




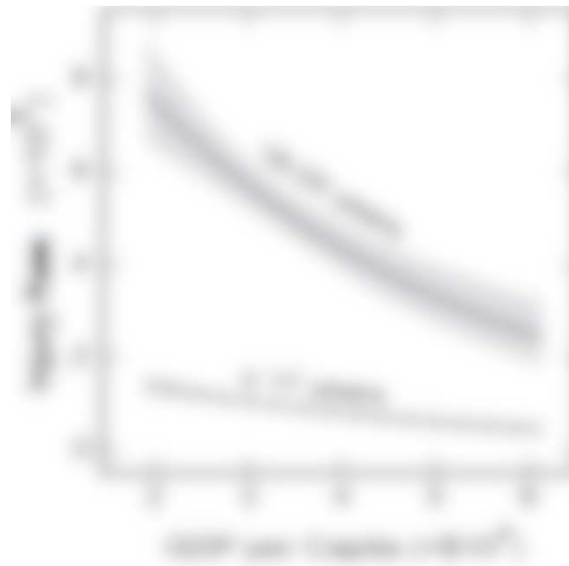


Increased prevalence of the cultural expectation that young people should be hard working is associated with reduced workplace injury.

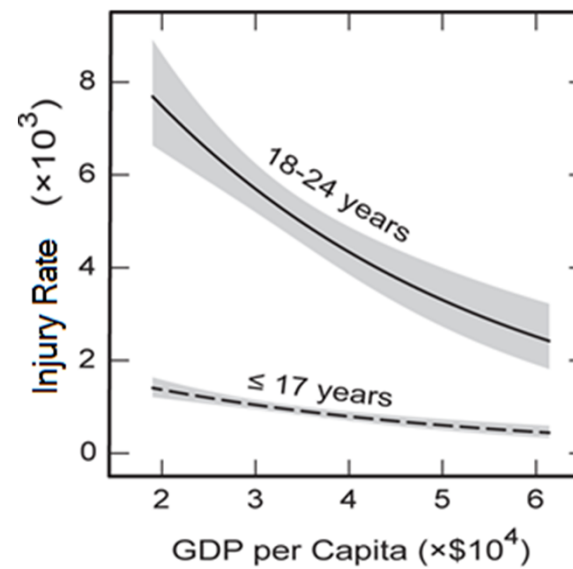
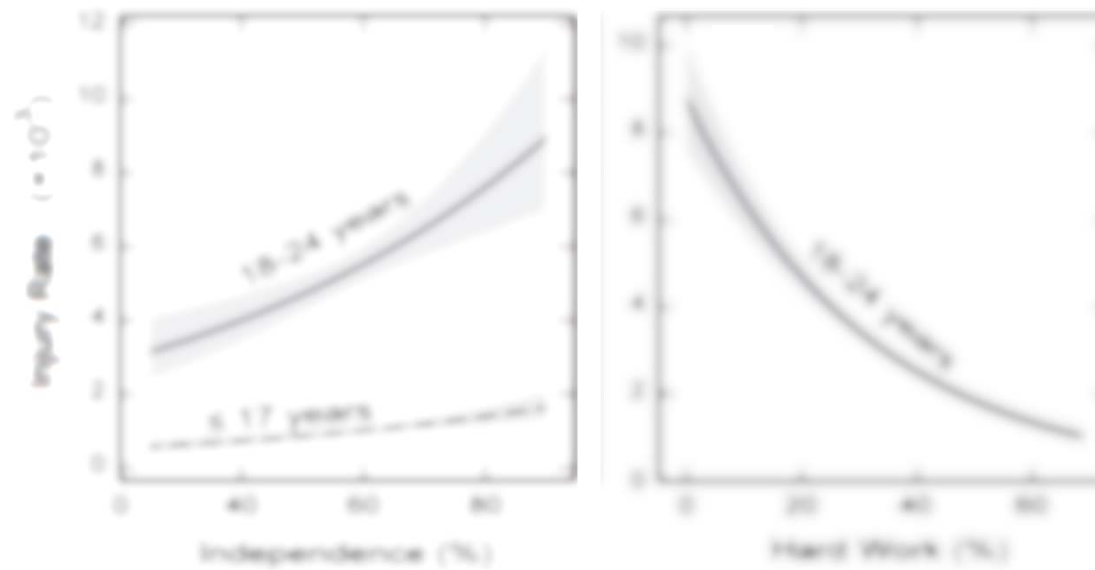




Increased prevalence of the cultural expectation that young people should be independent is associated with an increase in rate of workplace injuries.







Increased GDP is associated with decreased injury rate.

## STUDY LIMITATIONS

- POSSIBLE DIFFERENCES IN REPORTING SYSTEMS.
- UNMEASURED CULTURAL / ECONOMIC / SOCIETAL FACTORS.
- ECOLOGICAL FALLACY.
- ANALYSIS BASED ON WHO INJURY DATABASE FROM 1995 TO 2007.



# RECOMMENDATIONS:

- REDUCE EFFECTS OF CULTURAL PERCEPTIONS THAT YOUNG PEOPLE SHOULD BE INDEPENDENT.
- EDUCATION AND HEALTH AND SAFETY PROGRAMS TO PROMOTE PSYCHOLOGICAL HEALTH OF YOUNG WORKERS.
- EARLY INVOLVEMENT OF YOUNG PEOPLE IN WORK EXPERIENCE, ADEQUATE TRAINING, AND PROMOTION OF THE SOCIETAL EXPECTATION THAT YOUNG PEOPLE SHOULD BE HARD-WORKING.





## CONCLUSION

CULTURAL VALUES  
SOCIETAL ATTITUDES



NATIONAL ECONOMY

INJURY RATES IN  
YOUNG WORKERS

PREVENTION OF INJURIES IN YOUNG WORKERS IS IMPORTANT.

CONSIDER MACRO LEVEL FACTORS.

WIDE SCOPE FOR FUTURE RELATED RESEARCH.



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# ACKNOWLEDGEMENTS

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*RESEARCH & DATA ANALYSIS CENTRE*

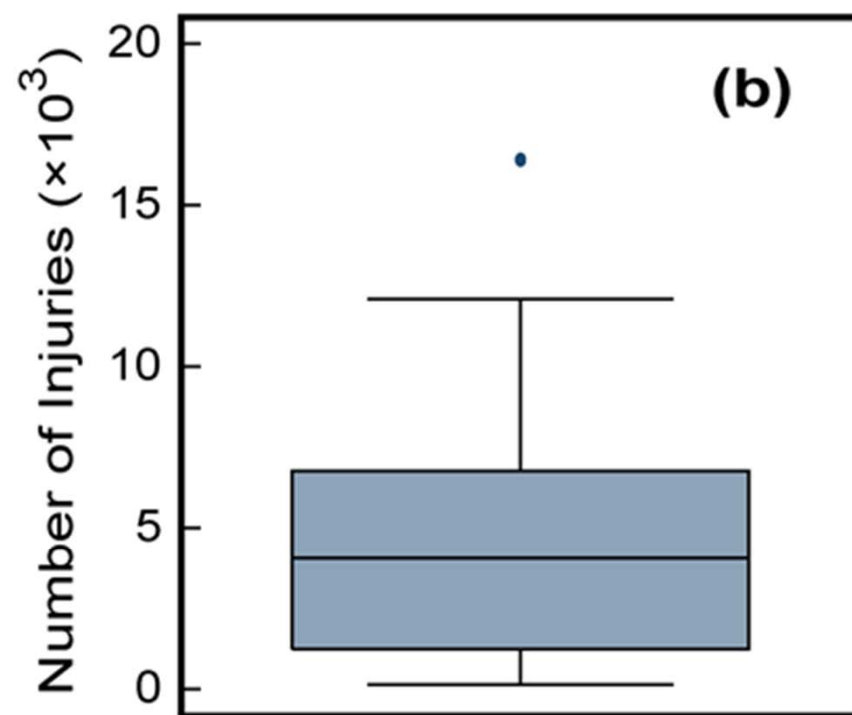
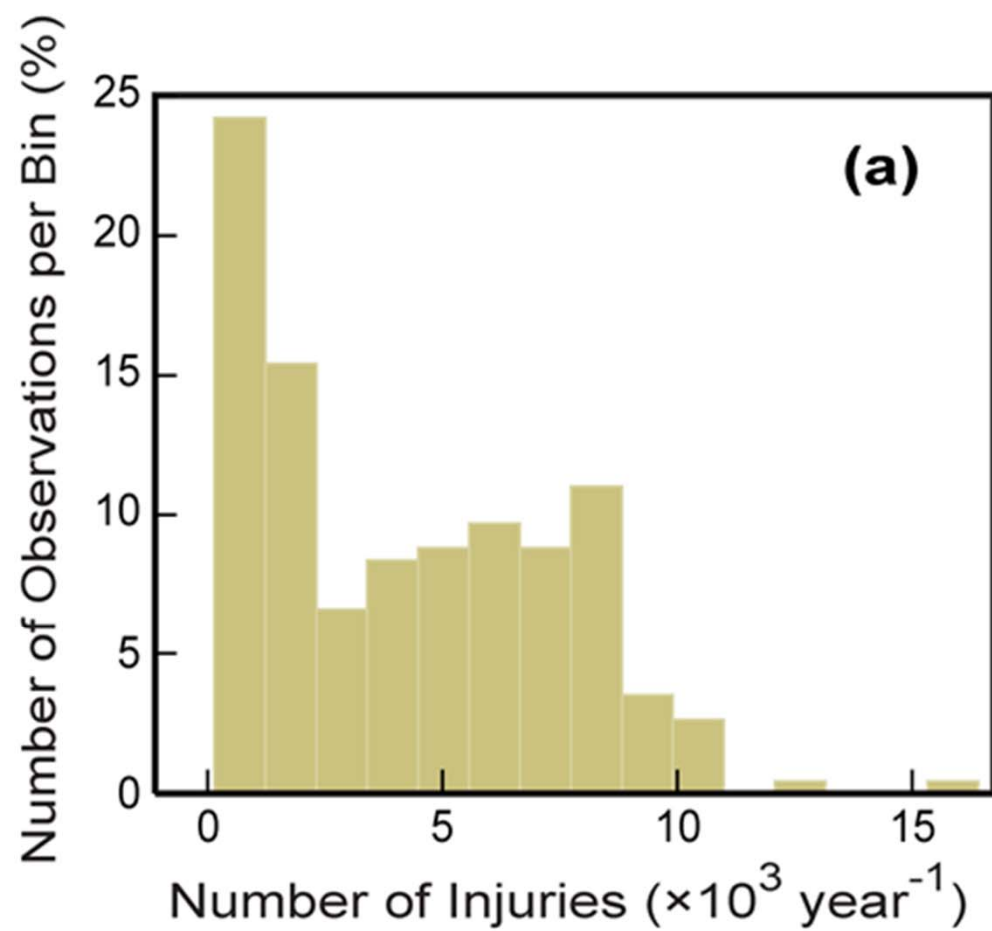
DR. EUGEN MATTES

*FAFOEM*

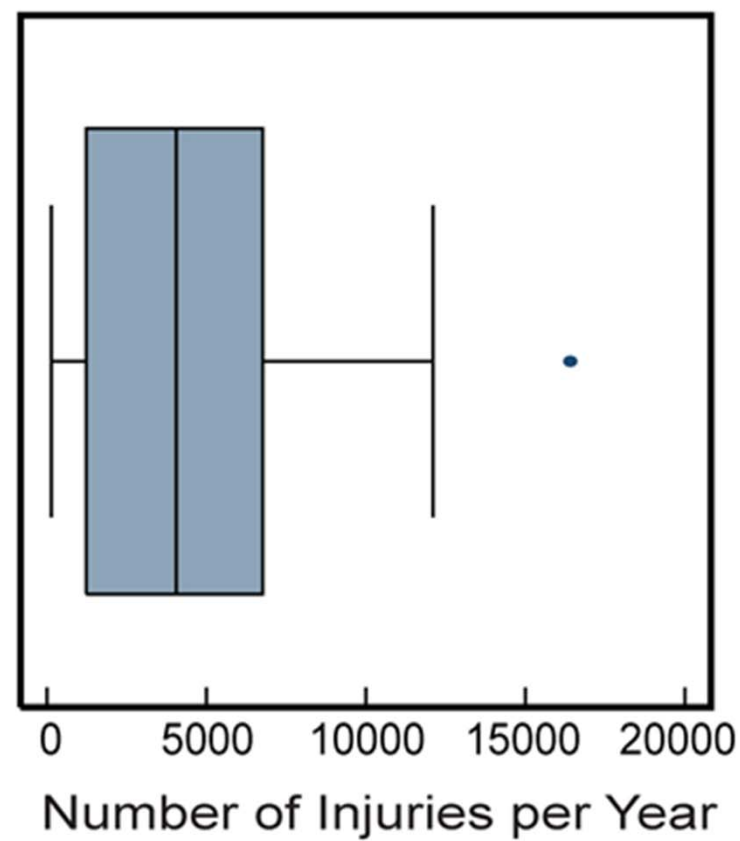
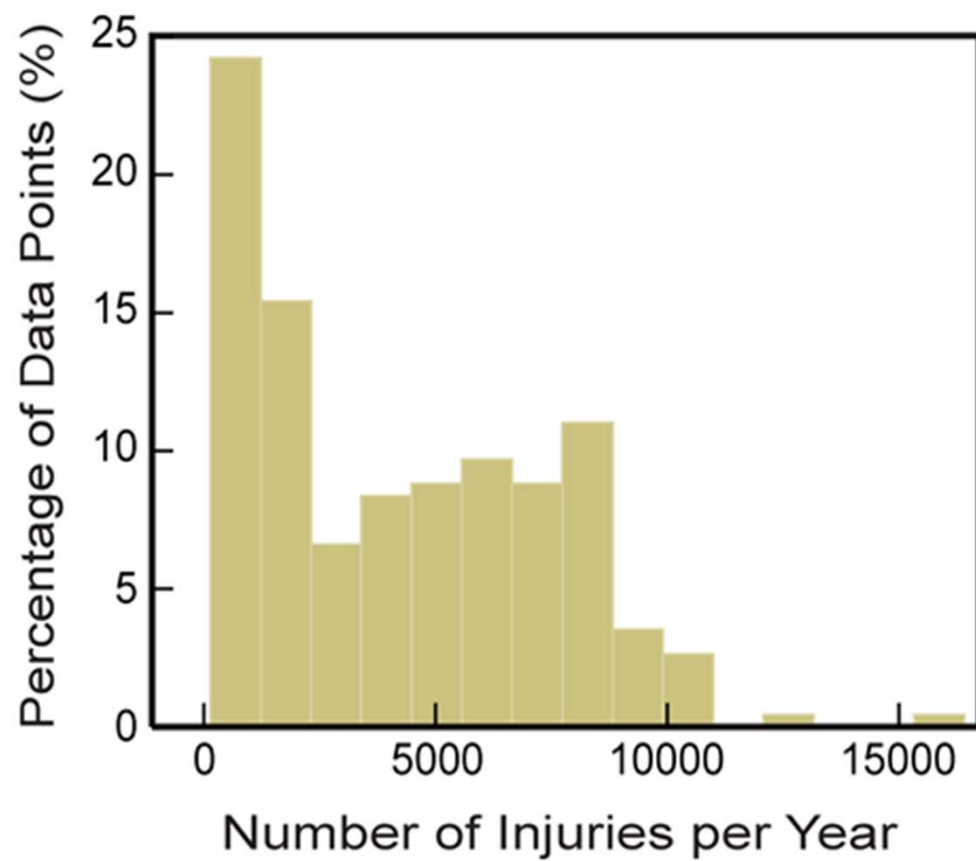




**THANK YOU**









$$\text{LN}[\text{INJURY NUMBER}(18-24\text{Y})] = \text{LN}[\text{INJURY NUMBER}(< 18\text{Y})] + 1.70$$

INJURY NUMBER WILL INCREASE  $\text{EXP}\{1.7\} = 5.47$  TIMES:

$$\text{INJURY NUMBER}(18-24\text{Y}) = 5.47 \times \text{INJURY NUMBER}(< 18\text{Y}).$$



$$\ln[\text{INJURY NUMBER}] + 0.016$$

INJURY NUMBER WILL INCREASE  $\exp\{0.016\} = 1.016$  TIMES

INJURY NUMBER INCREASES BY 1.6%



REGRESSION COEFFICIENT FOR DIRECT EFFECT IS **-0.000027**

REGRESSION COEFFICIENT FOR INDIRECT EFFECT IS  **$0.0010 \times 0.016 = 0.000016$**

TOTAL EFFECT OF GDP ON LOGARITHM OF INJURY NUMBER IS THE SUM OF THE DIRECT AND INDIRECT EFFECTS

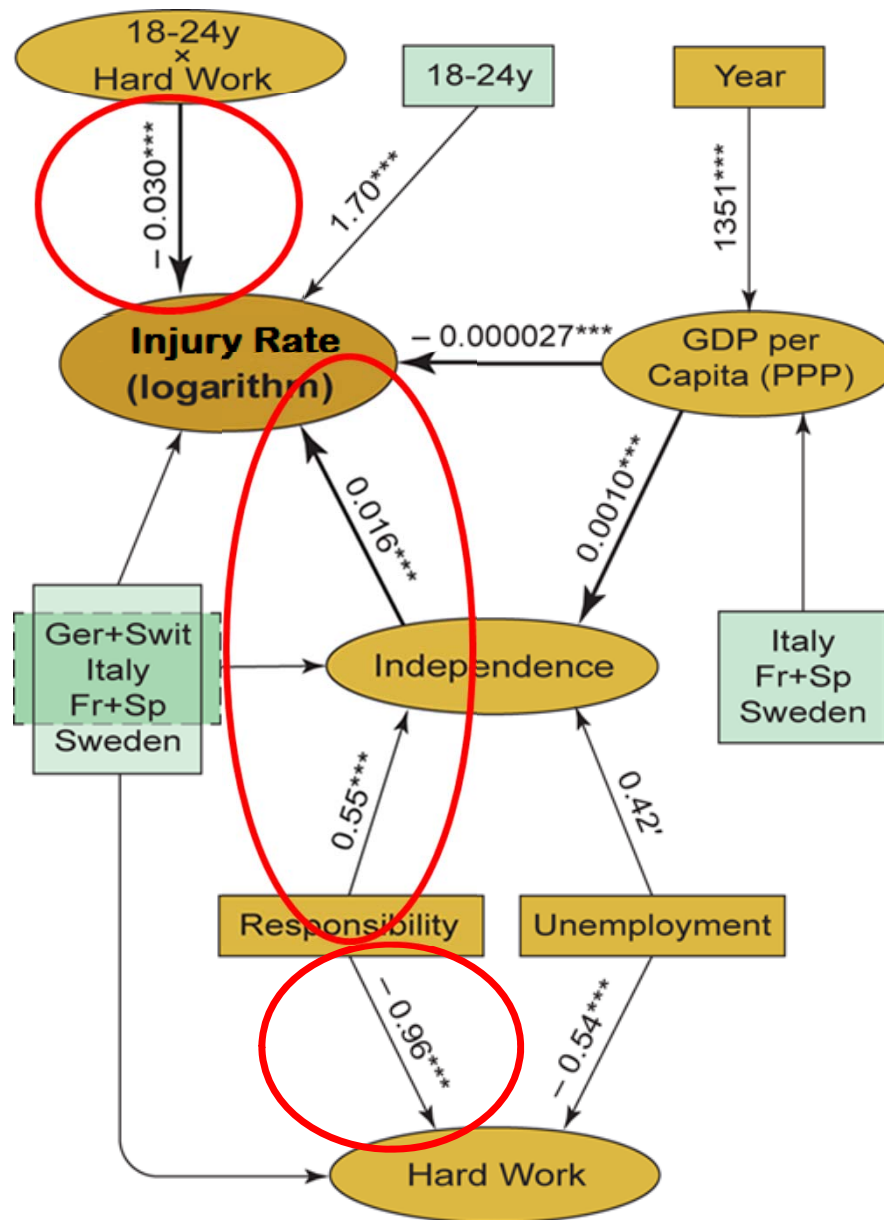
$$\mathbf{0.000016 - 0.000027 = -0.000011}$$

INCREASING GDP BY \$1 RESULTS IN DECREASED LN(INJURY NUMBER) BY **0.000011**

INJURY NUMBER VARIABLE DECREASES BY  **$1.1 \times 10^{-3} \%$**

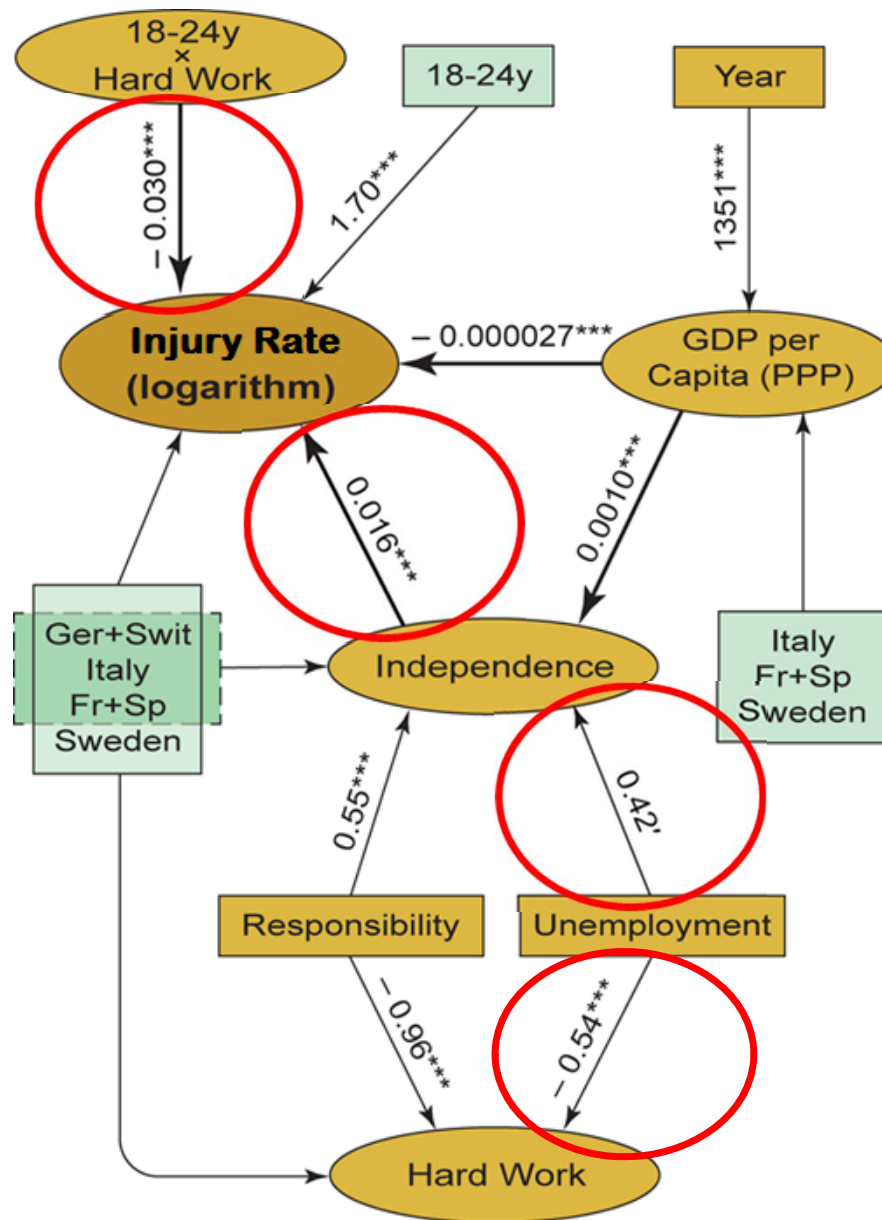
INCREASING GDP BY \$1000 RESULTS IN DECREASE OF NUMBER OF NON-FATAL WORKPLACE INJURIES BY **1.1%**





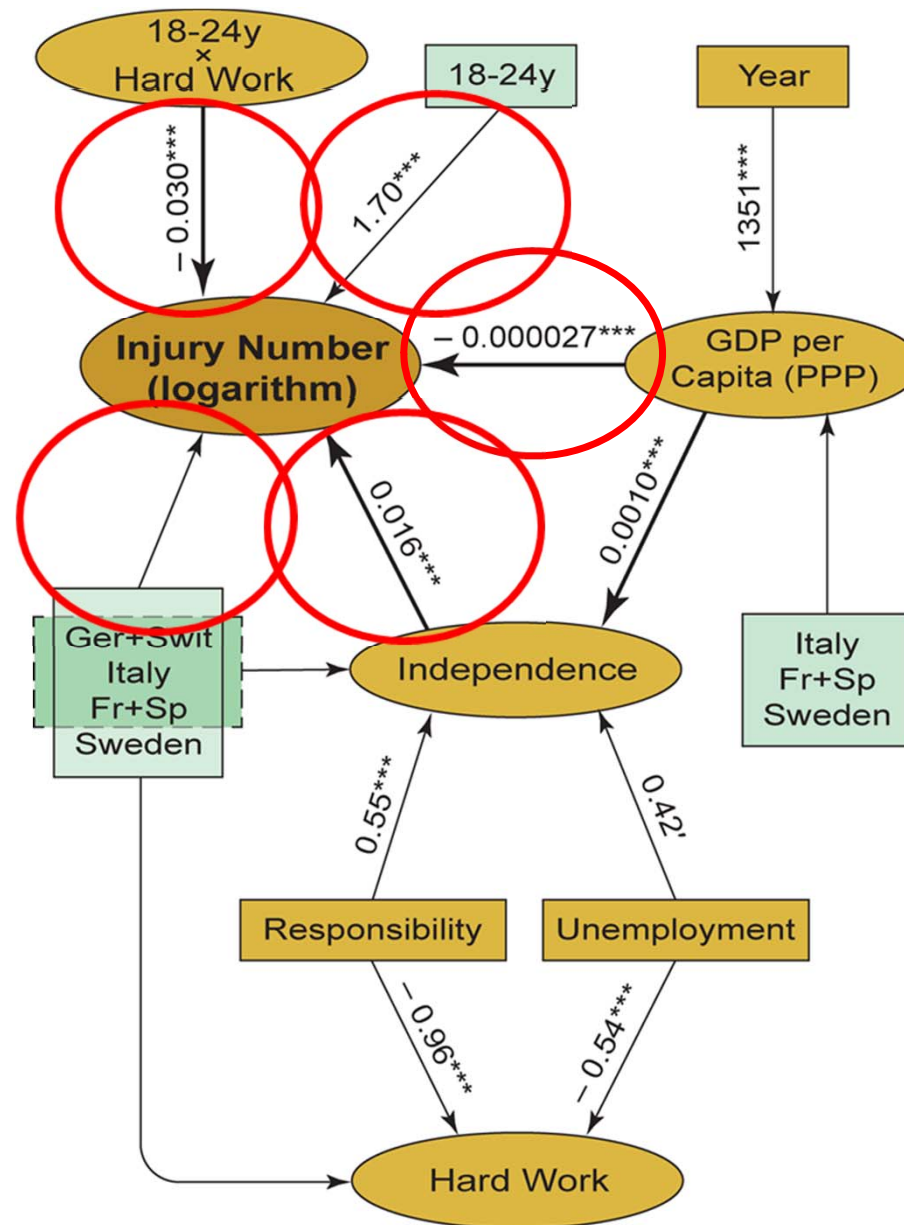
Increased Injury Number

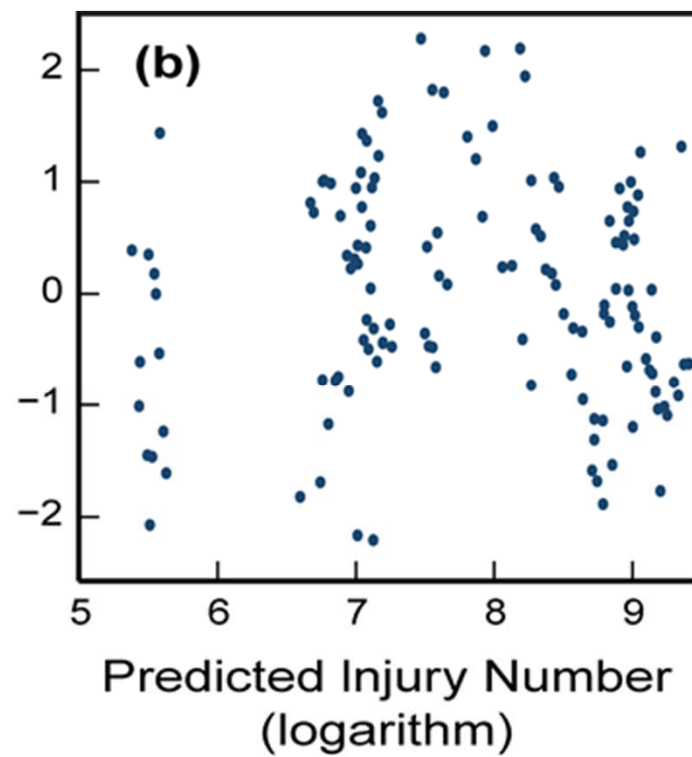
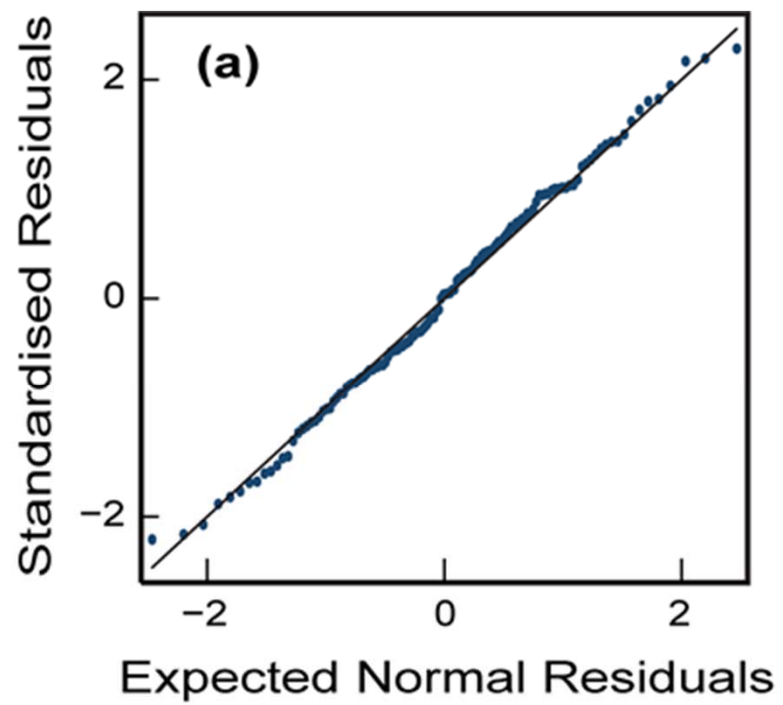




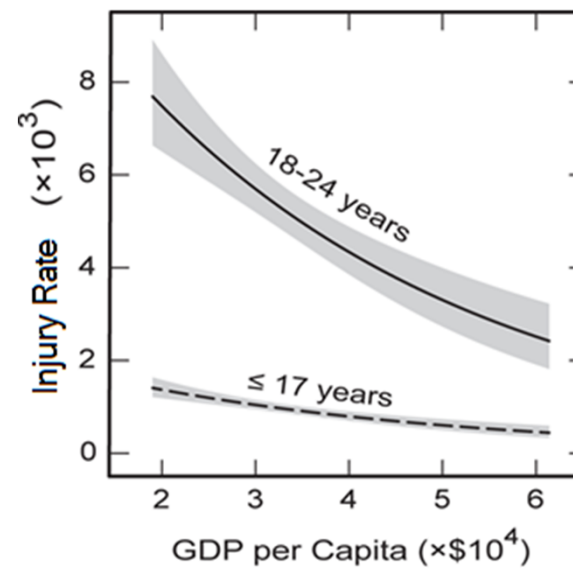
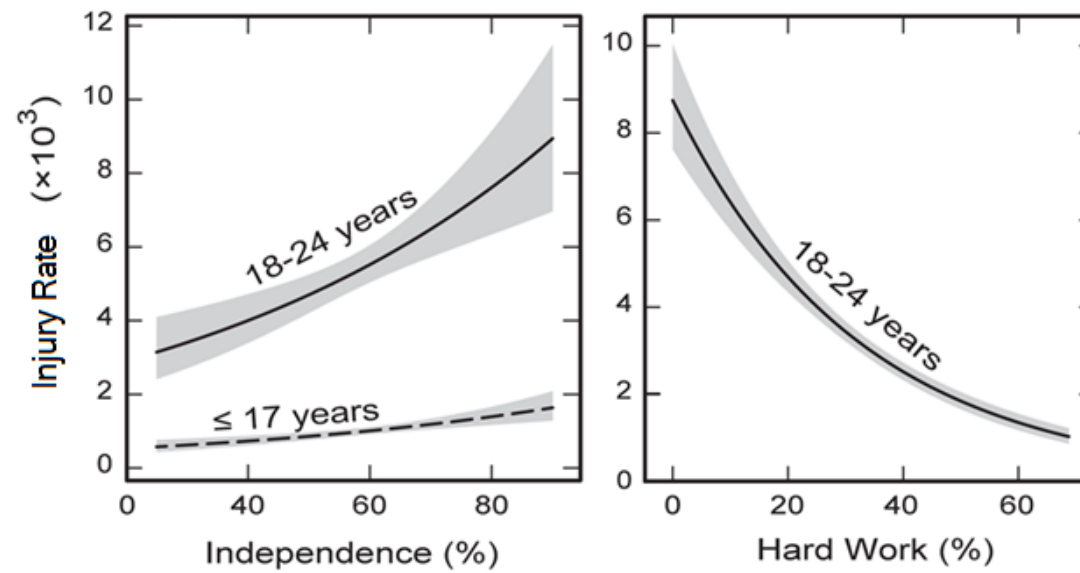
Increased Injury Number











## CONCLUSIONS:

- 18-24 YEARS AGE CATEGORY FOUND TO HAVE AN INCREASED INCIDENCE OF WORKPLACE INJURIES.
- EXPECTATIONS THAT CHILDREN SHOULD FEEL RESPONSIBILITY AND BE INDEPENDENT ASSOCIATED WITH INCREASED NUMBERS OF WORKPLACE INJURIES.
- EXPECTATION THAT CHILDREN SHOULD BE HARD WORKING ASSOCIATED WITH REDUCED NUMBERS OF WORKPLACE INJURIES IN THE 18-24 YEARS AGE CATEGORY.
- INCREASED GDP ASSOCIATED WITH REDUCED NUMBERS OF WORKPLACE INJURIES
- INCREASED UNEMPLOYMENT ASSOCIATED WITH INCREASED NUMBERS OF WORKPLACE INJURIES.



## STUDY LIMITATIONS

- DISTRIBUTION OF THE TRANSFORMED VARIABLE WAS NOT ENTIRELY NORMAL.
- MODEL FIT WAS BASED ONLY ON DIRECT EFFECTS OF NUMERICAL VARIABLES.
- LACK OF SIGNIFICANT DIFFERENCES BETWEEN COUNTRIES DID NOT FULLY ELIMINATE POSSIBILITY OF DIFFERENT REPORTING SYSTEMS.
- OTHER POSSIBLE INFLUENCING CULTURAL ATTITUDES AND SOCIETAL DIFFERENCES.
- ECOLOGICAL FALLACY.
- ANALYSIS BASED ON WHO INJURY DATABASE FROM 1995 TO 2007.