



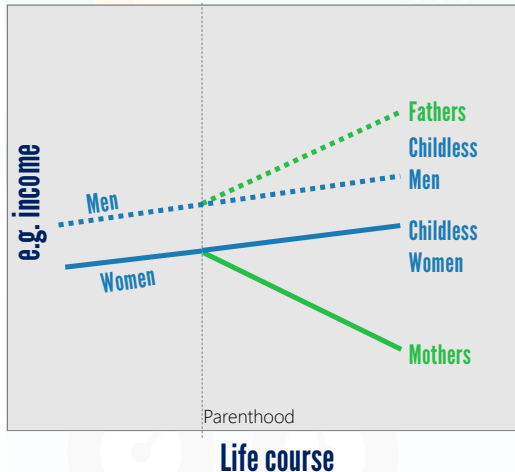
# PARENTHOOD AND PHYSICAL ACTIVITY IN GERMANY – A LONGITUDINAL PERSPECTIVE

Michael Kühhirt (Universität zu Köln & GU Frankfurt)  
[michael.kuehhirt@uni-koeln.de](mailto:michael.kuehhirt@uni-koeln.de)

Nadine Reibling (Universität Siegen & BZgA)

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# MOTIVATION: Parenthood and Social Inequality



Previous research has identified the transition to parenthood as critical event for the formation and development of social inequality in life domains such as

- Family (e.g. division of domestic labour),
- Labour market (e.g. income),
- Health (e.g. mental wellbeing).

(e.g. Evertsson & Boye 2016, Arránz Becker et al. 2017)

# MOTIVATION: Research on Parenthood and Health

## Mortality and Health in Older Age

- Disadvantages for childless persons and persons with many children

(e.g. Hank 2010)

## Physical Health and Mental Wellbeing

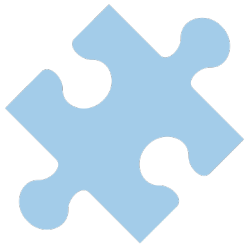
- Role of social context (e.g. social background, family structure)
- Lack of life course perspective that differentiates between children in different age groups

(e.g. Arránz Becker et al. 2017)

## Health Behaviour

- Potential mechanism of parenthood → health
  - Mostly cross-sectional studies or short observation periods
- Lack of life course perspective and control for selection effects

(e.g. Reczek et al. 2014)



**1**  
**How does parenthood influence (weekly) physical activity of women and men?**

**2**  
**Does this effect change over time?**

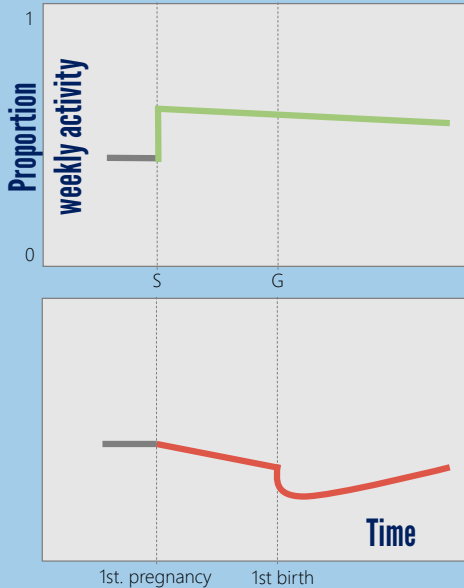
# SOCIAL CONTROL

Thesis: Parenthood connected with societal expectations of being a role model, which work through peers, family members and other social contacts (e.g. Umberson 1987).

# ROLE CONFLICT

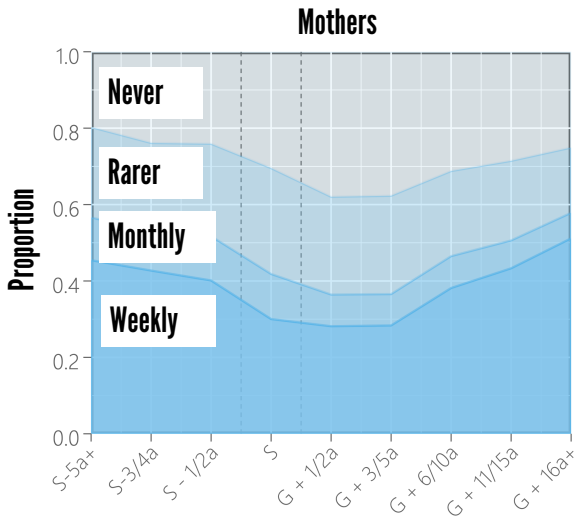
Thesis: Transition to parenthood leads to higher workload, which is connected with constraints on time and energy and an increase in stress (e.g. Goode 1960).

## THEORETICAL EXPECTATIONS



# Physical Activity

(Self reports with 4 answer categories)

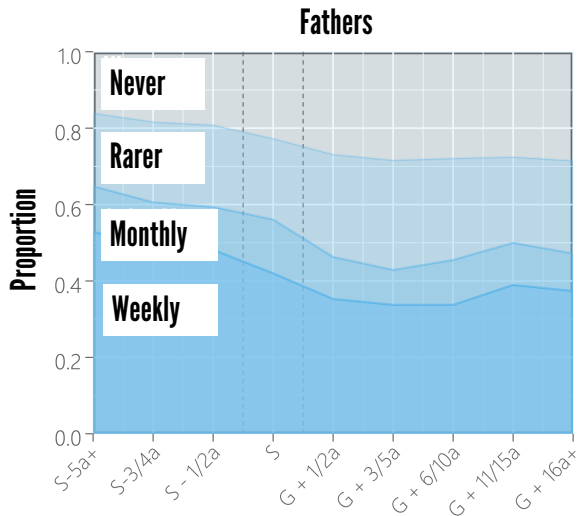


## DATA: Socio-economic Panel

- 5 749 initially childless women living in Germany 1985-2019
- Birth cohorts 1960/91
- On average 7.3 observations per woman
- At least 2 observations before first birth
- Monthly birth histories
- Further information: age, survey year, education (Abitur yes/no), family structure

# Physical Activity

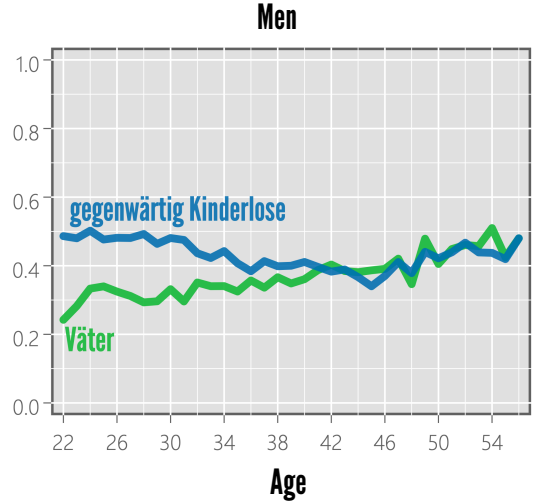
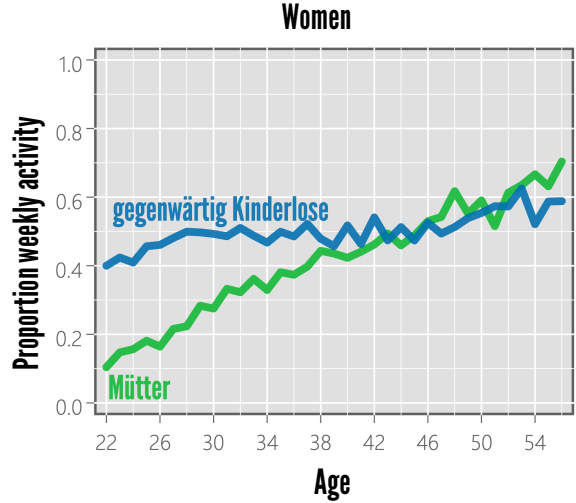
(Self reports with 4 answer categories)



## DATA: Socio-economic Panel

- 5 257 initially childless men living in Germany 1985-2019
- Birth cohorts 1960/91
- On average 7.9 observations per man
- At least 2 observations before first birth
- Monthly birth histories
- Further information: age, survey year, education (Abitur yes/no), family structure

# WEEKLY ACTIVITY: DIFFERENCES BETWEEN PARENTS AND CHILDLESS PERSONS BY AGE





# WHAT IF...? THE CAUSAL EFFECT OF PARENTHOOD

Defined as difference,  $\Delta$ , in the proportion of weekly activity,  $P[A_w = 1]$ , between parents,  $E = 1$ , and that proportion if the same people had not become parents,  $E = 0$ :

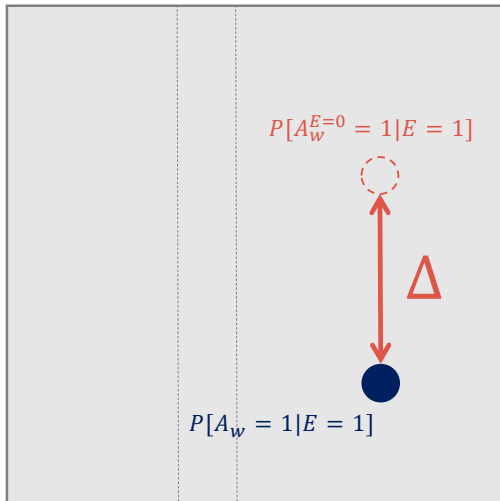
$$\Delta = P[A_w^{E=1} = 1 | E = 1] - P[A_w^{E=0} = 1 | E = 1]$$

$$P[A_w^{E=0} = 1 | E = 1]$$

 $\Delta$ 

$$P[A_w^{E=1} = 1 | E = 1]$$

# WHAT IF...? THE CAUSAL EFFECT OF PARENTHOOD



Defined as difference,  $\Delta$ , in the proportion of weekly activity,  $P[A_w = 1]$ , between parents,  $E = 1$ , and that **proportion if the same people had not become parents**,  $E = 0$ :

$$\Delta = P[A_w = 1 | E = 1] - P[A_w^{E=0} = 1 | E = 1]$$

The first proportion is observable as the factual proportion of parents.

The second proportion is **counterfactual** and therefore **not observable**. So the **difference,  $\Delta$** , of interest cannot be calculated directly.

But we can make assumptions about where  $P[A_w^{E=0} = 1 | E = 1]$  could be located and estimate  $\Delta$  on the basis of these assumptions.

Depending on the assumptions,  $\Delta$  can be positive, negative, more or less pronounced or even zero.

# ANALYTICAL STRATEGY

## Group difference

Assumption: No (unmeasured) differences between childless persons and parents w/o parenthood

$$P[A_W = 1|e, z] = \beta_0 + \boxed{\beta_1 e_t} + \beta_k z_k$$
$$\rightarrow \Delta = \beta_1$$

## Difference in differences

Assumption: Parallel trends for childless persons and parents w/o parenthood

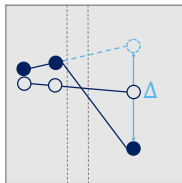
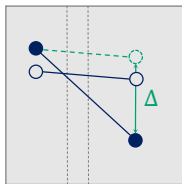
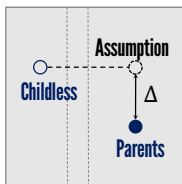
$$P[A_W = 1|e, z] = \delta_0 + \boxed{\delta_1 e_t + \delta_2 e} + \delta_k z_k$$
$$\rightarrow \Delta = \delta_1$$

## Difference in trends

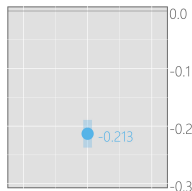
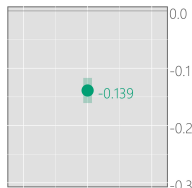
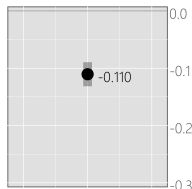
Assumption: Continuation of pre-birth trends w/o parenthood

$$P[A_W = 1|e, z] = \theta_0 + \boxed{\theta_1 e_t + \theta_2 e + \theta_3 e \times a} + \theta_k z_k$$
$$\rightarrow \Delta = \theta_1$$

# DIFFERENCE



# ESTIMATE $\Delta_{\text{women}}$



Difference in proportion weekly activity

# ANALYTICAL STRATEGY

## Group difference

Assumption: No (unmeasured) differences between childless persons and parents w/o parenthood

$$P[A_W = 1|e, z] = \beta_0 + \boxed{\beta_1 e_t} + \beta_k z_k$$
$$\rightarrow \Delta = \beta_1$$

## Difference in differences

Assumption: Parallel trends for childless persons and parents w/o parenthood

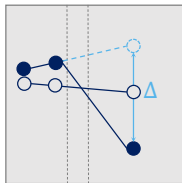
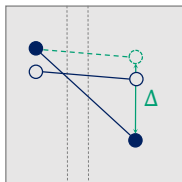
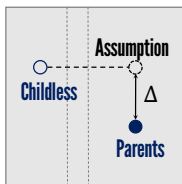
$$P[A_W = 1|e, z] = \delta_0 + \boxed{\delta_1 e_t + \delta_2 e} + \delta_k z_k$$
$$\rightarrow \Delta = \delta_1$$

## Difference in trends

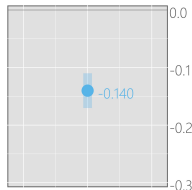
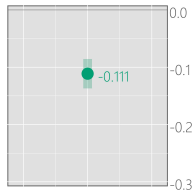
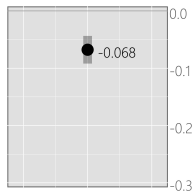
Assumption: Continuation of pre-birth trends w/o parenthood

$$P[A_W = 1|e, z] = \theta_0 + \boxed{\theta_1 e_t + \theta_2 e + \theta_3 e \times a} + \theta_k z_k$$
$$\rightarrow \Delta = \theta_1$$

# DIFFERENCE

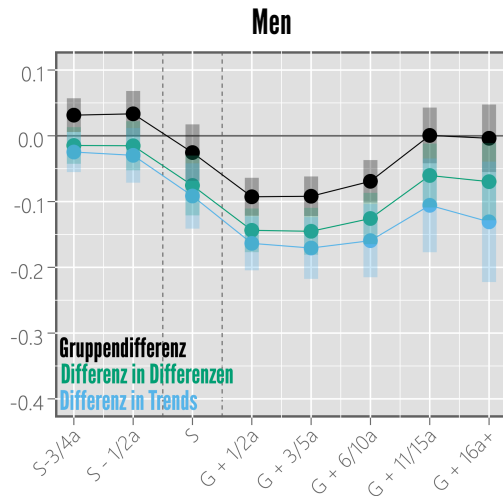
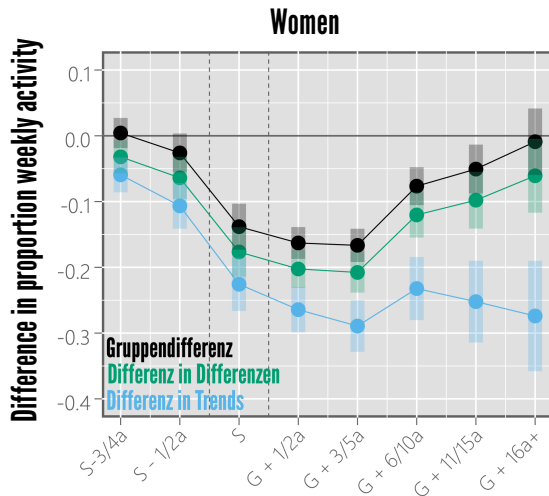


# ESTIMATE $\Delta_{men}$



Difference in proportion weekly activity

# EFFECT OF PARENTHOOD OVER TIME

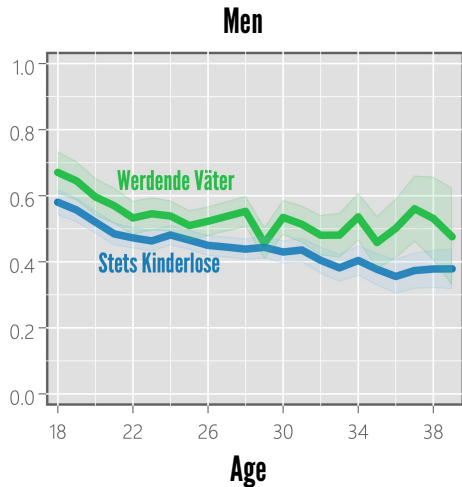


Reference: Observations of always childless persons and to-be parents more than 4 yrs before 1st pregnancy

# TRENDS BEFORE FIRST PREGNANCY

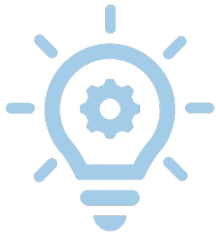


→ Rather consult **Difference in Trends**



→ Rather consult **Difference in Differences**



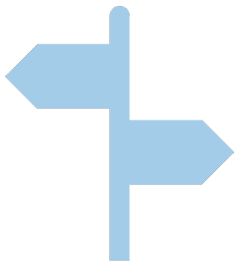


**a** Parenthood markedly and lastingly reduces the probability of weekly physical activity, especially for women.

**b** Constraints from **role conflict** outweigh mechanisms of social control (at least regarding physical activity).

**c** Transition to parenthood contributes significantly to inequality in health behaviour.

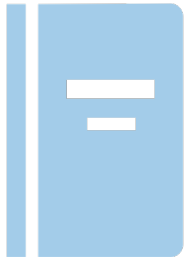
**d** Measures to alleviate role conflict may not only matter for the labour market, but may also have implications for parents' health.



- **Project for further research:**
  - Role of cultural and institutional contexts
  - Qualitative country comparison  
(up to 7 countries, most-similar/different-systems)
  - Additional health behaviours  
(Tobacco and alcohol consumption, diet, sleep)
- **Further analyses (in the appendix)**
  - ‚No activity‘ as dependent variable
  - Linear vs. quadratic trend prior to first birth
  - Group differences (education, birth cohort)



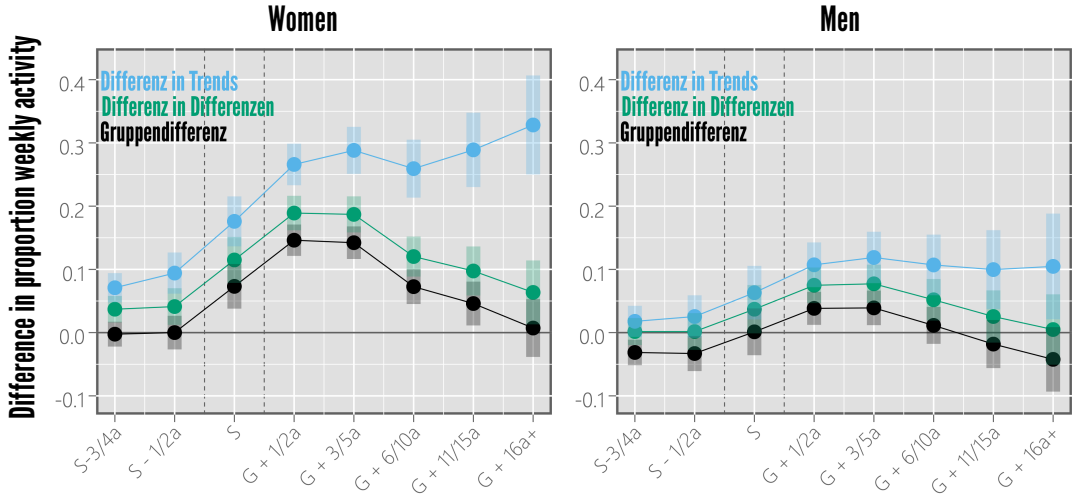
**THANK YOU  
FOR YOUR ATTENTION**



- Arránz Becker, O., Loter, K., & Becker, S. (2017). Familie und Gesundheit: Ein methodenkritischer Blick auf die aktuelle Forschung. In P. Kriwy & M. Jungbauer-Gans (Hg.), Handbuch Gesundheitssoziologie (S. 1-25). Wiesbaden: Springer.
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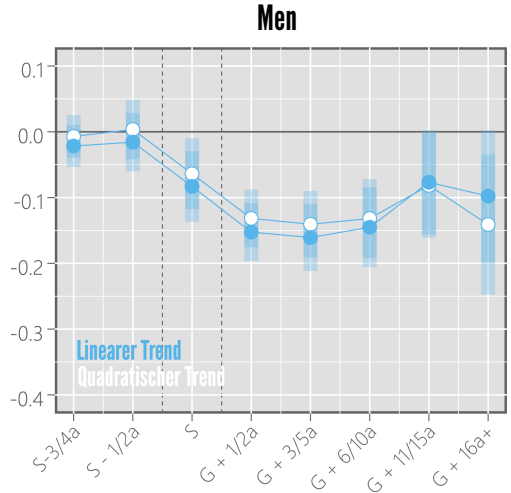
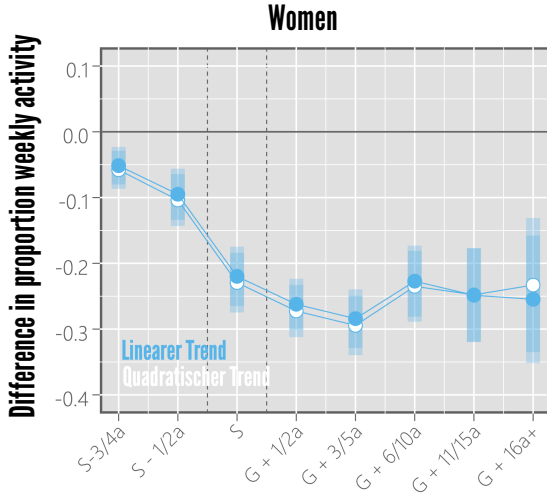
# FURTHER ANALYSES

# EFFECT OF PARENTHOOD OVER TIME (NO ACTIVITY)



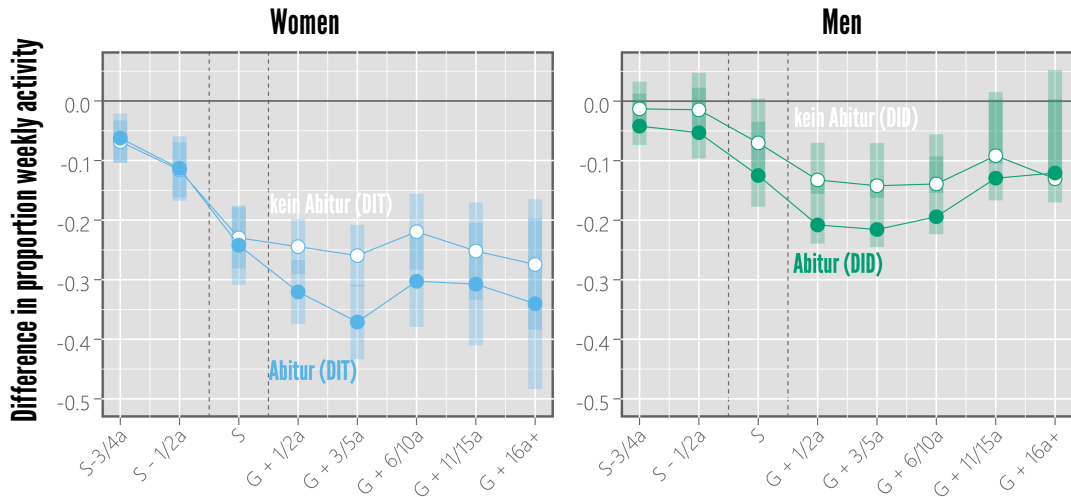
Reference: Observations of always childless persons and to-be parents more than 4 yrs before 1st pregnancy

# EFFECT OF PARENTHOOD OVER TIME (ALT. ASSUMPTIONS REG. TREND)



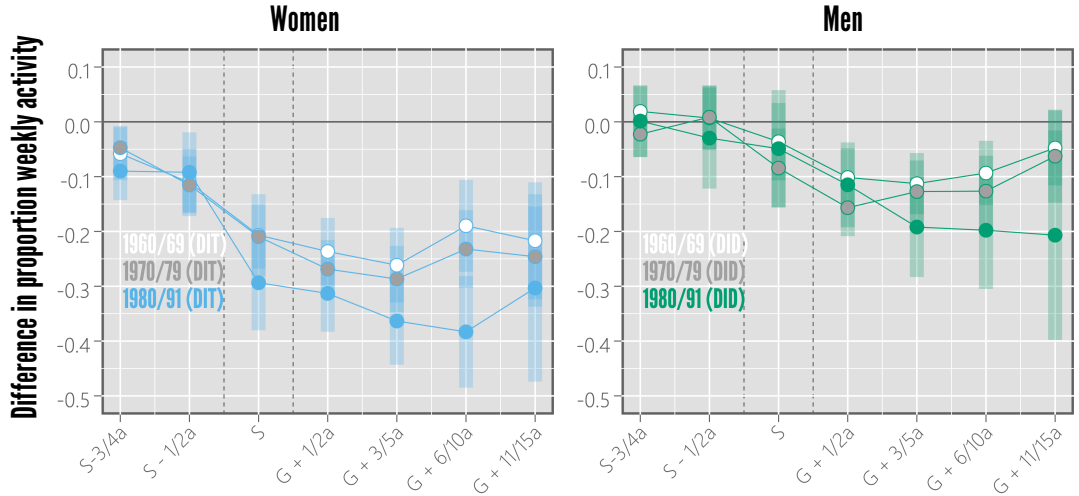
Reference: Observations of always childless persons and to-be parents more than 4 yrs before 1st pregnancy

# EFFECT OF PARENTHOOD OVER TIME (BY EDUCATION)



Reference: Observations of always childless persons and to-be parents more than 4 yrs before 1st pregnancy

# EFFECT OF PARENTHOOD OVER TIME (BY BIRTH COHORT)



Reference: Observations of always childless persons and to-be parents more than 4 yrs before 1st pregnancy