Children, Household Specialization and Relationship Quality

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(Job Market Paper)

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Having children changes people's lives

- Children increase responsibilities ⇒ Parents reorganize how they use time:

  - ▶ Mothers reduce labor market time [Kleven et al., 2019; Goldin, 2021]

  - ▶ Parents spend more time in home production [Aguilar-Gomez et al., 2019; Siminski and Yetsenga, 2022]

  - ▶ Reduction in leisure and sleep times [Aguiar and Hurst, 2007; Costa-Font and Flèche, 2020]

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Relationship Quality and Children

- **Relationship Quality:** Proxy non-material gains from being in a couple
  - ▶ Incorporated in models of couple formation, dissolution and fertility decisions [Browning et al., 2014; Chiappori, 2020; Greenwood et al., 2017]
  - ▶ With limited empirical guidance [Weiss and Willis, 1997; Chiappori et al., 2018]

- Particularly relevant in the context of children:

  - Influences investments in child education

  - Associated with couple dissolution, affecting children
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What is the impact of having a child on couples' relationship quality?

- Introduce a novel measure of relationship quality (RQ)
- Study the causal effect of children on RQ
  - Perform a dynamic difference-in-differences estimation around first child birth

First child birth significantly and persistently reduces RQ

Impact both mothers and fathers

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- Document changes in labor market and housework times after birth
- Compute the share out of household total done by women
  - ▶ Divide couples depending on baseline division
- Study impact of childbirth on RQ by couple type

- Women increase housework and reduce labor time
- Gender-based specialization after birth, regardless of baseline arrangement
- Larger time rearrangement = Larger decrease in RQ

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▷ Introduce and test empirical proxy of match quality of couples

Empirical measurement of match quality [Amato and Booth, 2001; Busby et al., 1995; Carlson and VanOrman, 2017]

▷ Develop one-dimensional measure integrating multiple aspects of match quality and overcoming past data limitations

Consequences of having children [Blau and Kahn, 2017; Bertrand, 2020; Goldin, 2021; Kleven et al., 2019; Ahammer et al., 2023; Clark et al., 2008; Lillard and Waite, 1993; Svarer and Verner, 2008]

▷ Document impact on RQ of both mothers and fathers, with consequential impact on children

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Data and Empirical Strategy

Dataset and sample

- **Dataset:** Understanding Society, UK longitudinal household survey
  + Relationship history since 1991 (British Household Panel Survey)

- **Population of interest:**
  Individuals in a couple that become parents

- **Sample:** Summary Statistics

  Individuals cohabiting with their partners that had their 1st child in 2009-2021 observed at least once before and after birth

6

Measure of Relationship Quality

Partner Questionnaire to both cohabiting partners **individually**:

(a) Subjective assessments	(b) Couple time use

How often do you… ?
  consider splitting
  regret getting married
  quarrel
  get on each others nerves
	How often do you… ?
	  work together on a project
	  stimulating exchange of ideas
	  calmly discuss something
	  kiss partner

What is the… ?
  degree of happiness w/ couple
	Do you and your partner… ?
	  engage in outside interests

Factor analysis to construct RQ

- One-dimensional measure
- Explains 40.61% of the variation in the items

Factor Loadings

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What is the… ? degree of happiness w/ couple	*Do you and your partner… ?* engage in outside interests

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Factor Loadings

Distribution of RQ

Compare

Standardized and higher values indicate better relationships

(a) Before birth

Mean: 0.415
SD: 0.828

(b) After birth

Mean: -0.075
SD: 0.979

Validation of the measure

- **Informativeness**: Provides meaningful information about match quality
  - ▶ RQ predicts of marital transitions, particularly couple dissolution

- **Interpersonal comparability**: Commonality in the concept captured
  - ▶ High correlation in partners' RQ

- **Smooth evolution** over the life-cycle and with relationship tenure

- Association with partners' **observable characteristics**

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Empirical Strategy

We want to estimate the impact of first child birth on RQ

- Dynamic DiD: Two-Way Fixed Effects specification

$$y_{i,t} = \alpha_i + \mu_t + \sum \mathbb{1}\{j = t - G_i\}\delta_j + u_{i,t}$$

  ▶ $t - G_i$: time since i's first child was born (*event time*)

- Estimated using Callaway and Sant'Anna [2021] method

- δ_j provide the Average Treatment Effect on the Treated (ATT) under the following assumptions:

  A1. **No anticipation** - *RQ before birth does not depend on when individuals will have their first child in the future*

  A2. **Conditional parallel trends** - *In absence of treatment, RQ would have evolved in parallel for all parents, regardless of the year of birth (adoption cohort)*

  A3. *(for aggregation)* **Homogeneous effects across treatment cohorts**

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Impact of first child birth on Relationship Quality

First child birth significantly and persistently reduces RQ
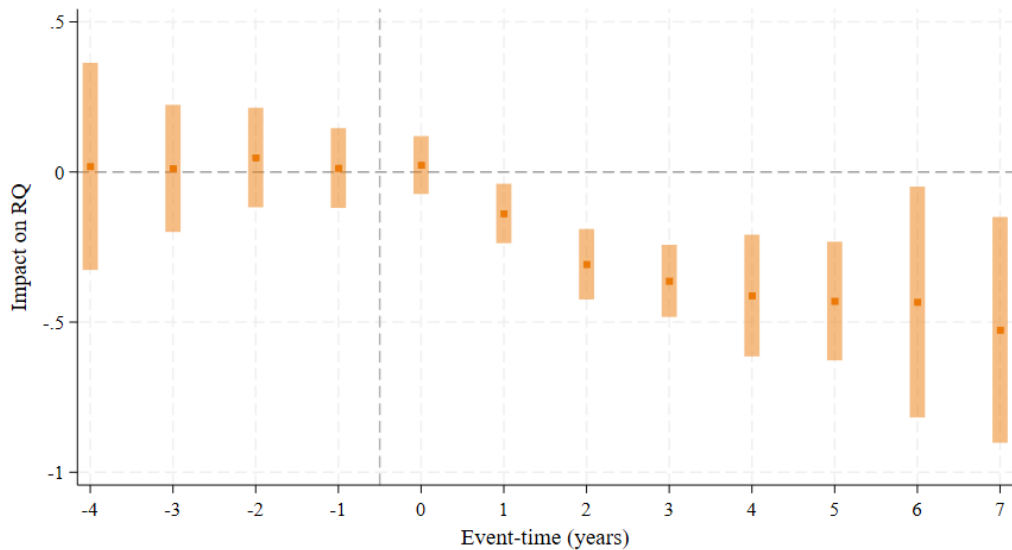
The results are not driven by…

- changes in time use items only or in item valuation after birth

- parents of more than one child

- attrition due to couple dissolution

- timing of birth, in terms of age and relationship tenure

More

How relevant is this finding?

Back-of-the-envelope calculations on divorce

	Dependent variable: Couple dissolution		
	(1)	(2)	(3)
RQ	-0.0106***	-0.00833***	-0.00698*
	(0.002)	(0.002)	(0.003)
Controls		✓	✓
Individual FE			✓
R-squared	0.007	0.054	0.050
Observations	17228	15555	15555

- Around 2% of the existing couples dissolve yearly in our sample

- 1/2 standard deviation decrease in RQ associated with a **17.5% higher probability of separation**

How relevant is this finding?

General happiness and RQ
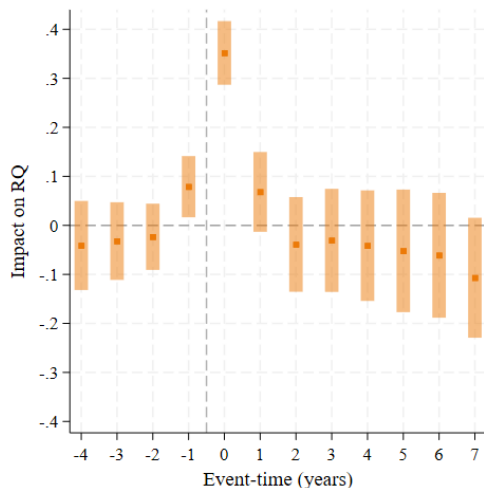
- *"Have you recently been feeling reasonably happy, all things considered?"*

- Very different from RQ:
  - ▶ Adapt to life events over time
  - ▶ Benefits of children balance out drawbacks in RQ

Other shocks: Unemployment

How relevant is this finding?

Similar impact on mothers and fathers

- *Child penalty*: Impact mothers' outcomes only
  - ► Labor market
  - ► Housework time
  - ► Mental health
- Fathers' RQ decreases to a similar magnitude as mothers'
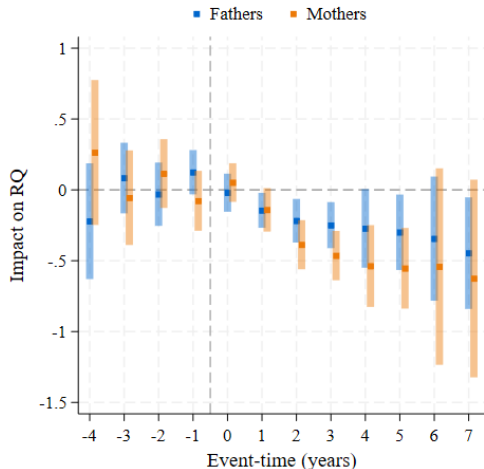
Mechanism: Changes in Household Specialization

How parents use their time changes after birth

(a) Paid market work hours

(b) Unpaid housework hours
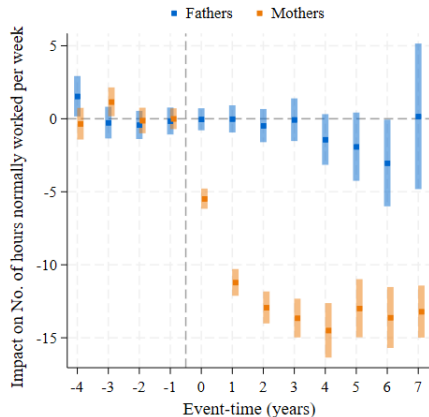
Baseline: Men 32 hours, women 27 hours
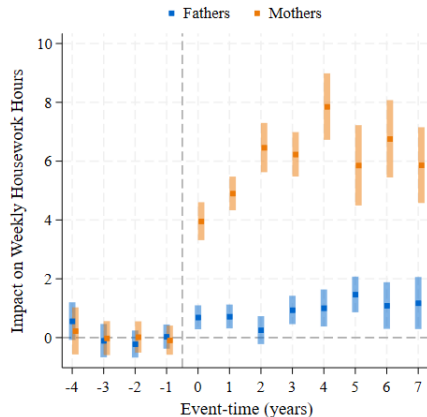
Baseline: Men 5 hours, women 8 hours

Characterize couples based on pre-birth roles

Compute share out of household total done by women for each type of work l:

$$\textit{female share}_l = \frac{\text{woman's hours}_l}{\text{man's hours}_l + \text{woman's hours}_l} \quad ; \quad l \in \{\text{market, house}\}$$

Classify couples by split of work times before first child birth:

- **Traditional:** Women specialize in housework and men in labor market work

- **Unbalanced:** Women take a larger share of both types of work

- **Egalitarian:** No specialization, 50-50 split of both work types

- **Counter-traditional:** Men take a larger share of housework

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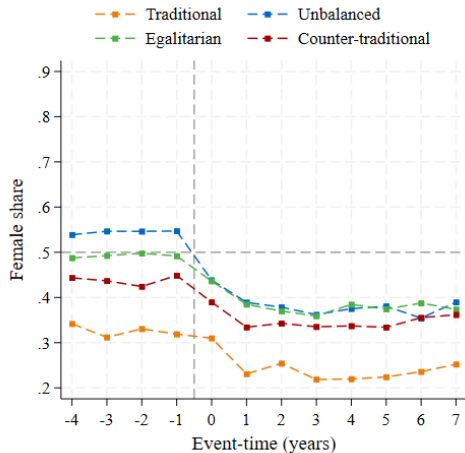Classify couples by split of work times before first child birth:

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  - *female share*$_{\text{market}} \leq 0.45$ and *female share*$_{\text{house}} \geq 0.55$

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Compute share out of household total done by women for each type of work l:

$$\text{female share}_l = \frac{\text{woman's hours}_l}{\text{man's hours}_l + \text{woman's hours}_l} \quad ; \quad l \in \{\text{market, house}\}$$

Classify couples by split of work times before first child birth:

- **Traditional**: Women specialize in housework and men in labor market work

- **Unbalanced**: Women take a larger share of both types of work

- **Egalitarian**: No specialization, 50-50 split of both work types
  - $0.45 \leq \text{female share}_{\text{market}} \leq 0.55$ and $0.45 \leq \text{female share}_{\text{house}} \leq 0.55$

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- **Counter-traditional**: Men take a larger share of housework
  - *female share*$_{house} \leq 0.45$

Gender-based specialization after childbirth
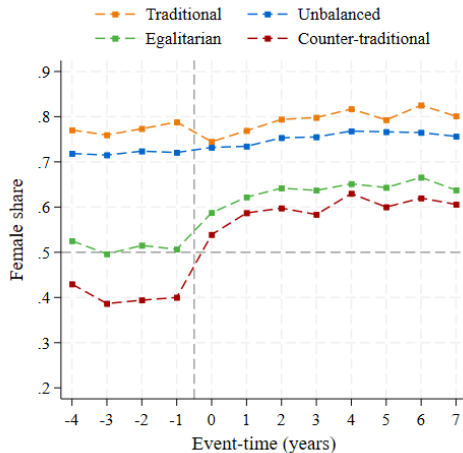
(a) Paid market work hours

(b) Unpaid housework hours

Who experiences the largest changes?

- Traditional: Roles **sustained**

- Unbalanced: Predominant role in **labor** market transferred **to fathers**
  - ▶ Women reduce total time contribution

- Egalitarian: Adopt gender-based **specialization**

- Counter-traditional: Predominant role at **home** transferred **to mothers**

Not behaving according to revealed comparative advantages pre-birth

→ Frictions in the labor market or identity considerations
[Akerlof and Kranton, 2000; Ichino et al., 2019]

→ Become prevalent after parenthood and unanticipated
[Kuziemko et al., 2018]

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[Kuziemko et al., 2018]

Couples experiencing largest changes suffer the most

	Traditional	Unbalanced	Egalitarian	Counter-traditional
Baseline RQ	0.345	0.424	0.568	0.459
	(0.993)	(0.749)	(0.633)	(0.784)
ATT	-0.107	-0.0992	-0.175*	-0.243**
	(0.180)	(0.086)	(0.069)	(0.075)
Observations	273	876	611	856

- Larger changes in housework associated with larger decreases in RQ
- More equal distribution of overall time mitigates the impact

Percentage of baseline   Plot   Controls   Baseline housework

Conclusions

1. **Having a child reduces Relationship Quality significantly and persistently**

   ▶ Similar decrease for mothers and fathers

2. **Parents change how they use their time after birth**

   ▶ Gender-based household specialization

   ▶ Larger reallocation of paid and unpaid work → Larger RQ decrease

Implications: Policies effectively inducing more equitable divisions of responsibilities may mitigate the negative impact on RQ

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- *Future research:*
  - ▶ How does RQ influence fertility decisions?
  - ▶ Can we disentangle the impact of parental divorce and low RQ on children?

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Appendix

Models of couple formation and dissolution

Two types of gains from being in a couple [Becker, 1991]:

– material: being in a couple financially beneficial (economies of scale, risk sharing)
– non-material: more subjective and match specific

Theoretical treatments of non-material component, or match quality:

1. Stochastic component, non-persistent shocks at each period [Chiappori and Weiss, 2006, 2007; Gemici and Laufer, 2011; Bruze et al., 2015; Voena, 2015; Greenwood et al., 2017; Low et al., 2018]

2. Deterministic but unobserved, noisy signal updated each period [Brien et al., 2006; Blasutto et al., 2020; Antler et al., 2022; Blasutto, 2024]

⇒ Limited empirical guidance on how match quality determines couple decisions

Empirical studies of match quality

- In Economics:
  - ▶ observed partner characteristics [Eckstein et al., 2019; Low, 2021; Weiss and Willis, 1997]
  - ▶ well-being, happiness and conflict [Bertrand et al., 2015; Chiappori et al., 2018]
  - → *Incorporate relationship-specific information*

- In Psychology:
  - ▶ propose and test measures of marital satisfaction and stress [Spanier, 1976; Busby et al., 1995; Norton, 1983; Funk and Rogge, 2007; Joel et al., 2020]
  - → *Comprehensive measure parsimoniously summarizing*

- Other disciplines associate match quality with
  - ▶ marital transitions, childbirth, health, financial resources, happiness, etc. [Perelli-Harris and Blom, 2022; Carlson and VanOrman, 2017; Rijken and Liefbroer, 2009; Fernandes-Pires et al., 2023; Halliday Hardie and Lucas, 2010; Meadows and Arber, 2015]
  - → *Overcome data shortcomings: longitudinal, own responses, present values*

Summary statistics the period before birth

	(1) Fathers	(2) Mothers		(3) Couples
Age	32.00 (6.323)	28.38 (6.058)	Tenure	4.186 (3.311)
College educated (%)	33.77 (47.30)	36.34 (48.11)	Married (%)	42.56 (49.20)
Active in labor mkt (%)	86.97 (33.65)	84.25 (36.42)	Female share of paid work	0.472 (0.210)
Employed (%)	82.48 (37.98)	78.09 (41.35)	Monthly household income	4045.0 (2988.5)
Weekly work hours	31.43 (17.04)	27.34 (16.11)	Female share of housework	0.630 (0.204)
Gross monthly income	2213.5 (1620.7)	1569.2 (1220.5)		
Weekly housework hours	5.157 (4.044)	8.583 (6.258)		
RQ	0.351 (0.860)	0.385 (0.895)		
Observations	2714	3260	Observations	4124

3

Summary statistics of never parents

	(1) Parents	(2) Childless*		(3) Parents	(4) Childless*
Age	32.08 (7.719)	40.10 (12.72)	Tenure	6.600 (4.357)	11.32 (11.38)
College educated (%)	30.91 (45.03)	33.61 (46.94)	Married (%)	44.72 (45.91)	41.16 (48.08)
Active in labor mkt (%)	75.23 (34.08)	84.63 (33.41)	Female sh. paid work	0.393 (0.224)	0.469 (0.266)
Employed (%)	68.56 (37.50)	79.95 (37.21)	Monthly hh income	3852.6 (2240.4)	4546.5 (2703.9)
Weekly work hours	23.17 (15.41)	27.66 (16.23)	Female sh. housework	0.672 (0.170)	0.649 (0.239)
Gross monthly income	1833.2 (1355.0)	1975.6 (1511.2)			
Weekly housework hours	9.662 (7.301)	9.096 (8.275)			
RQ	0.00597 (0.869)	0.0995 (0.963)			
Observations	9573	7578	Observations	6871	6469

*Individuals never having cohabiting own children, observed before age 45

Factor loadings of RQ

(a) Subjective assessment		(b) Couple time use	
How often do you… ?		*How often do you… ?*	
consider splitting	0.647	work together on a project	0.653
regret getting married	0.701	stimulating exchange of ideas	0.707
quarrel	0.618	calmly discuss something	0.526
get on each others nerves	0.674	kiss partner	0.510
What is the… ?		*Do you and your partner… ?*	
degree of happiness w/ couple	0.633	engage in outside interests	0.672

- Factor loadings are the correlation coefficient between an item and the factor

- RQ (factor 1) has **eigenvalue 4.06**, the next factor 1.46, the rest are below 1

- RQ explains **40.61%** of the variation

Factor loadings of RQ

Legend: ● Baseline ☐ Men △ Women ◇ Subjective RQ ✕ Time RQ

Item	Factor Score (Baseline)
Consider splitting	0.647
Regret getting married	0.701
Quarrel	0.618
Get on each other's nerves	0.674
Degree of happiness	0.633
Work together on a project	0.653
Stimulating exchange of ideas	0.707
Calmly discuss something	0.526
Kiss	0.511
Engage in outside interests	0.672

X-axis: Factor Scores (.45, .5, .55, .6, .65, .7, .75, .8, .85)
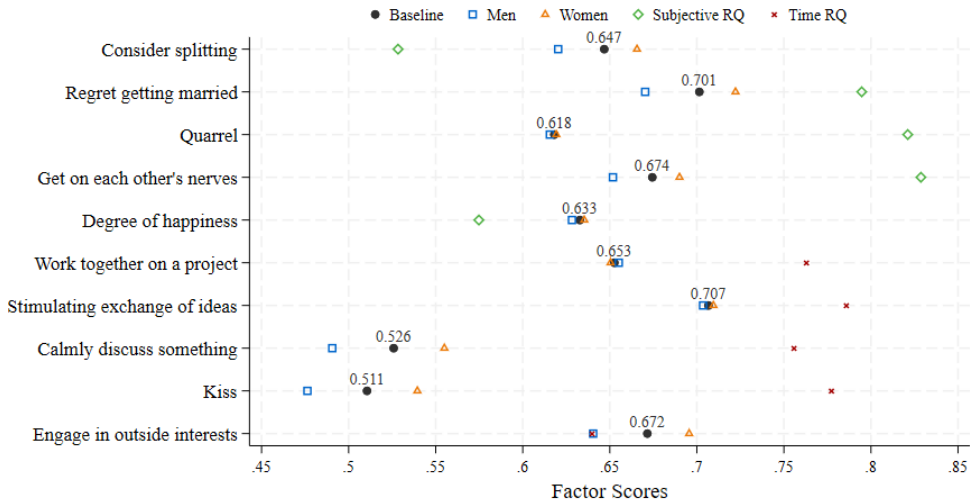
RQ measure: Life- and relationship-cycle profiles

$$y_{i,t} = \phi_i + \lambda_t + \sum_a \mathbb{1}\{a = \text{age}_{i,t}\}\alpha_a + \sum_d \mathbb{1}\{d = \text{tenure}_{i,t}\}\gamma_d + u_{i,t}$$

(a) Life-cycle: α_a
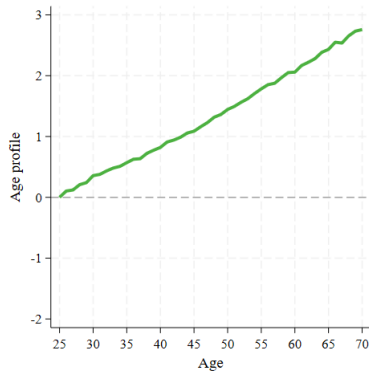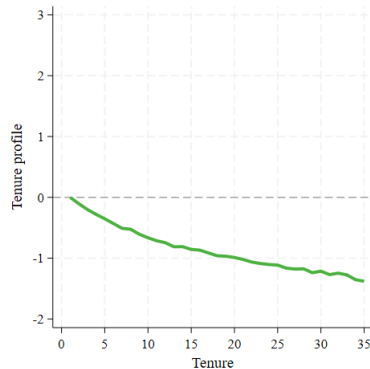
(b) Relationship cycle: γ_d

RQ measure: Life- and relationship-cycle profiles

(a) Life-cycle: α_a
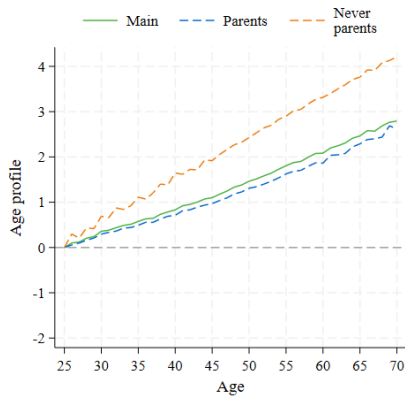
(b) Relationship cycle: γ_d
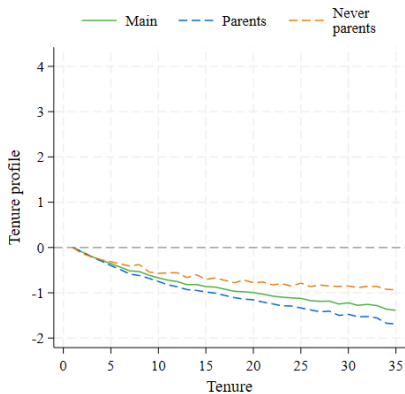
	(1)	(2)
Women	-0.109***	
	(0.007)	
College	0.111***	-0.016
	(0.012)	(0.033)
Employed	0.066***	0.008
	(0.014)	(0.010)
Log Income	0.014**	0.000
	(0.004)	(0.003)
Married	0.257***	0.062**
	(0.018)	(0.020)
Children	-0.248***	-0.078***
	(0.015)	(0.013)
Urban	-0.058***	-0.010
	(0.013)	(0.021)
Age $\times$ Tenure $\times$ Wave	✓	✓
Individual FE		✓
R-squared	0.046	0.074
Observations	106826	106826

Distribution of RQ for never parents

Mean values (sd):

Before 0.041 (0.94)
After -0.036 (0.99)
Never parents 0.102 (0.99)
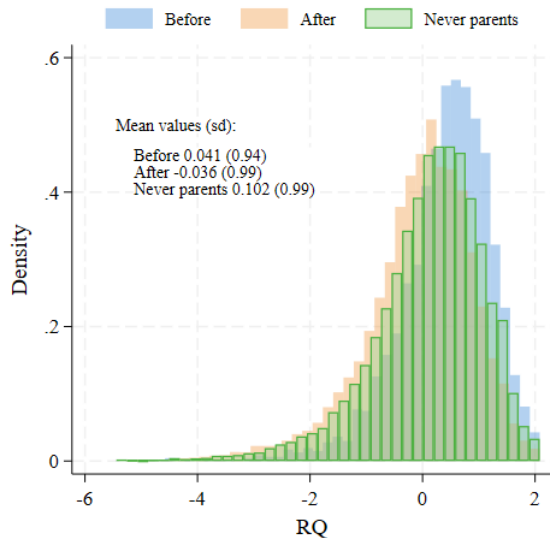
Validity: Informativeness
Behavior Prediction

(a) Marital transitions
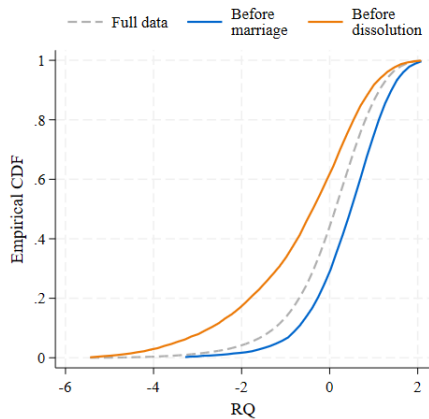
(b) Fertility decisions
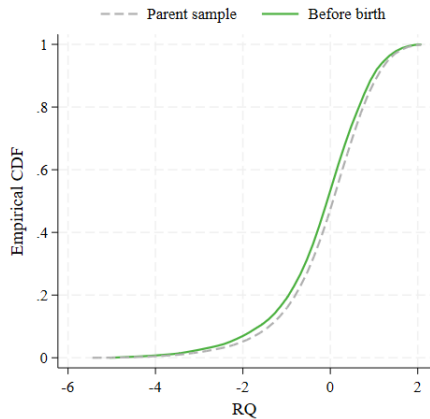
Validity: Informativeness

Behavior Prediction

	Separation		Marriage	
	(1)	(2)	(3)	(4)
Lagged RQ	-0.00876***	-0.00634***	0.00309***	-0.000371
	(0.001)	(0.001)	(0.001)	(0.001)
Controls		✓		✓
Individual FE	✓	✓	✓	✓
R-squared	0.003	0.029	0.000	0.025
Observations	93854	84586	93854	84586

Validity: Interpersonal comparability

Within Couple Correlation

	Woman RQ	
	(1)	(2)
Man RQ	0.608***	0.593***
	(0.008)	(0.008)
Controls		✓
Age $\times$ Tenure $\times$ Wave		✓
Observations	37380	36851
R^2	0.3139	0.3237

Validity: Interpersonal comparability

Rank-Rank Correlation
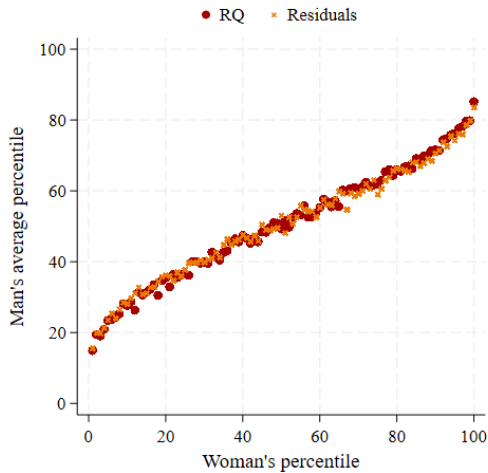
- **Issue:** The usual specification carries out *forbidden* comparisons: uses already treated as controls

- **Proposed method:**
  1. Compute cohort ATT estimates using only not-yet treated as controls in pairwise comparisons:

  $$ATT(g, t) = \mathbb{E}[Y_{i,t} - Y_{i,g-1}|G_i = g] - \mathbb{E}[Y_{i,t} - Y_{i,g-1}|g' > t \geq g]$$

  $\rightarrow$ *Controls:* cohorts g' that were treated after the period t

  2. Aggregate ATTs at the event-time level using as weights the share of each cohort at every event-time

15

Illustration of comparisons - Consider 3 individuals:
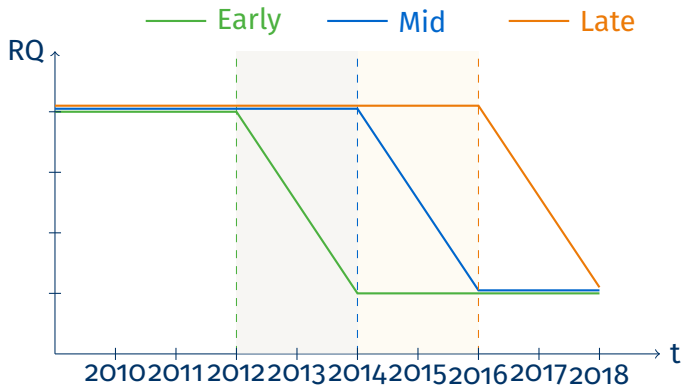
Controls for	2013-2014	2015-2016	2017-2018
early	●●	●	○
mid	-	●	○
late	-	-	○

A1. No anticipation - *RQ does not predict when individuals have their first child*

Formally: If a unit is untreated in period t, its outcome does not depend on when it will be treated in the future

$$Y_{i,t}(g) = Y_{i,t}(\infty) \text{ for all } i \text{ and } t < g$$

- First child birth is not preceded by changes in RQ

A2. Conditional parallel trends - *In absence of treatment, RQ would have evolved in parallel for all cohorts g*

<u>Formally:</u> All adoption groups would have evolved in parallel in absence of treatment. For all $t \neq t'$ and $g \neq g'$:

$$\mathbb{E}[Y_{i,t}(\infty) - Y_{i,t'}(\infty)|G_i = g] = \mathbb{E}[Y_{i,t}(\infty) - Y_{i,t'}(\infty)|G_i = g']$$

- Compare individuals that already had children with individuals that did not have children yet

A1. No anticipation - Checks

No large variation in pre-birth year-to-year changes
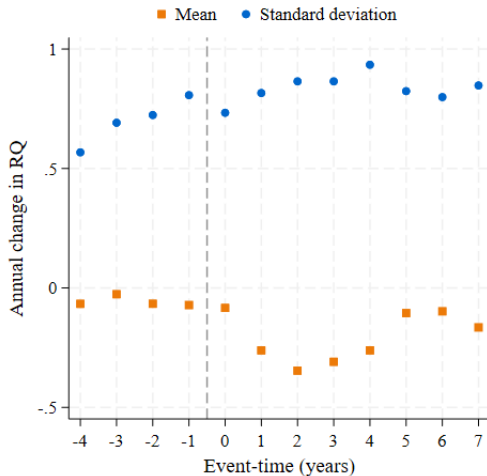
A2. Conditional parallel trends - Checks

No differences with delayed fertility
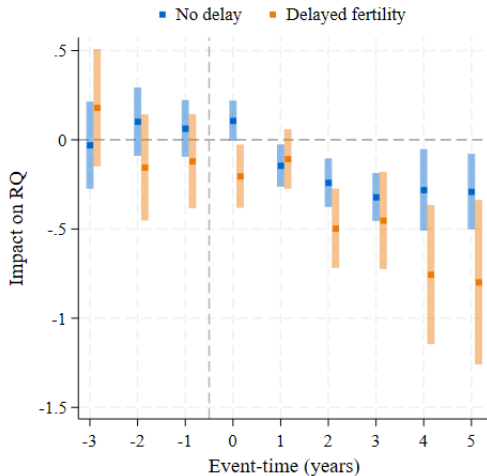
A3. Homogeneous treatment effects - Checks

No differences across cohorts
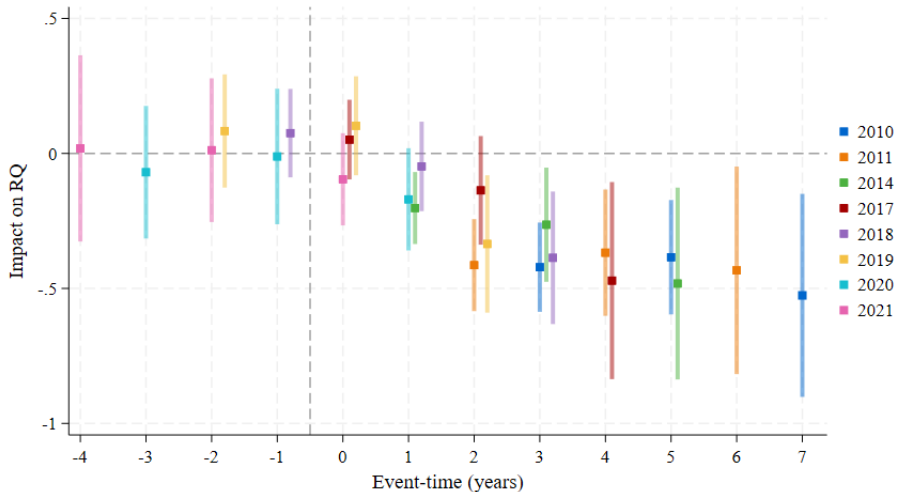
1. Time invariance of RQ: by item block

(a) Subjective assessment
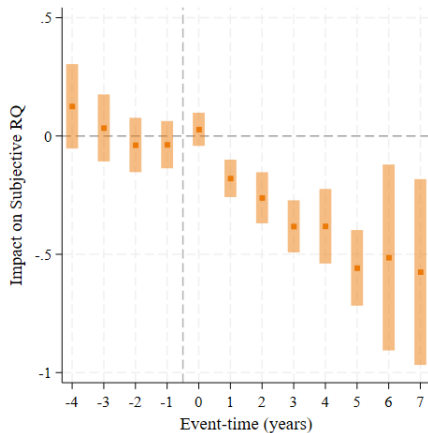
(b) Couple time use
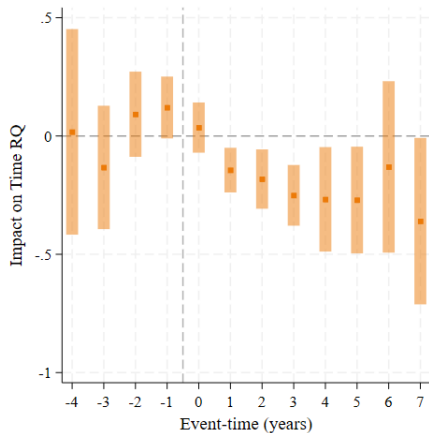
Factor Loadings   Distribution   By item: subjective assessment   By item: time use

1. Time invariance of RQ: using parent scores
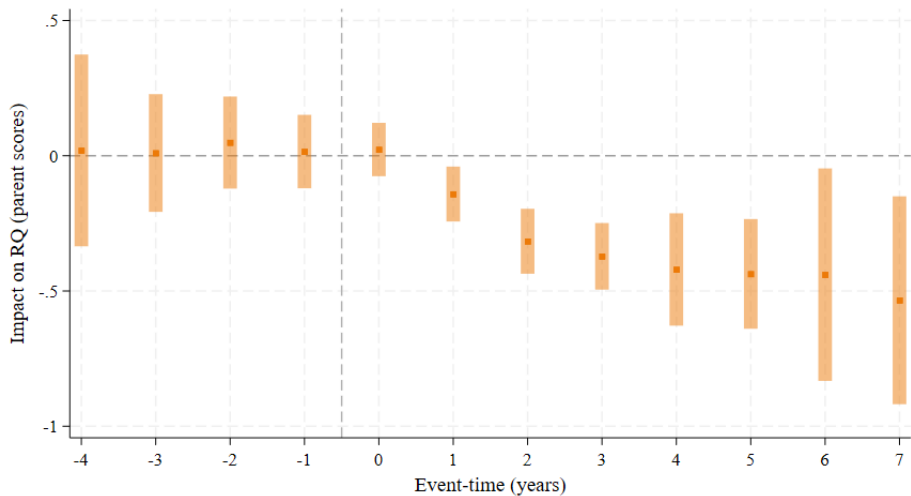
2. Subsequent fertility
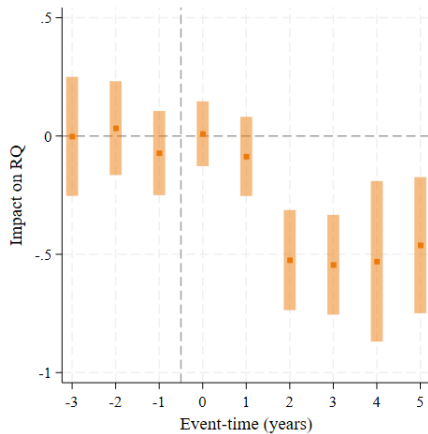
(a) One child

(b) More than one child
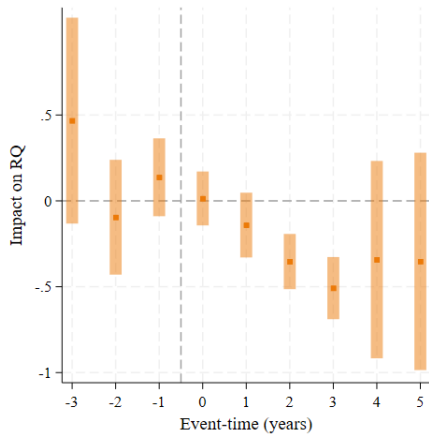
2. Subsequent fertility

Individuals observed at the end of their fertility cycle

	(1) One child	(2) More than one
ATT	-0.360***	-0.212*
	(0.102)	(0.101)
Observations	693	1041

3. Selected sample

(a) Divorce
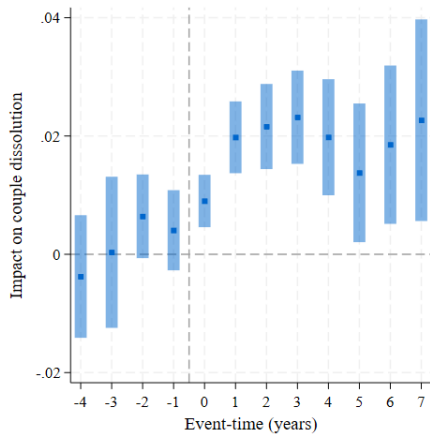
(b) Non-separating couples
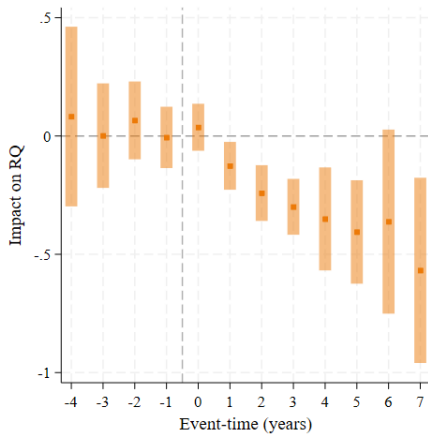
4. Timing of birth: Average RQ by age and tenure bin
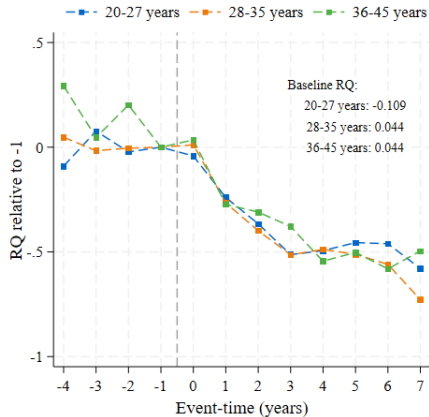
(a) Age bins

(b) Tenure bins
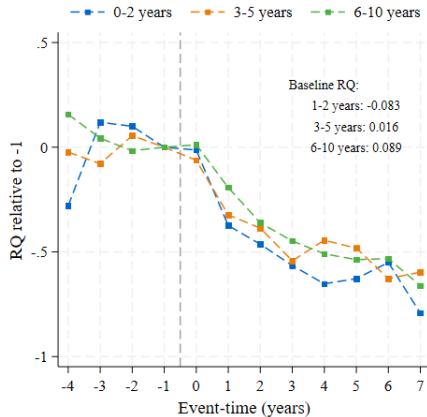
4. Timing of birth: Control for baseline
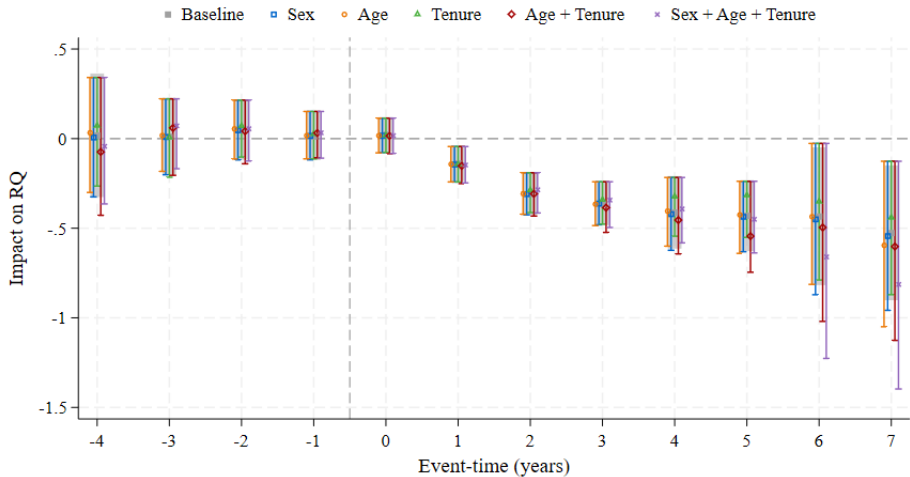
$$y_{i,t} = \sum_{j \neq -1} \mathbb{1}\{j = t - G_i\}\delta_j + \sum_a \mathbb{1}\{a = \text{age}_{i,t}\}\alpha_a + \sum_d \mathbb{1}\{d = \text{tenure}_{i,t}\}\gamma_d + \sum_w \mathbb{1}\{w = \text{period}_t\}\psi_w + v_{i,t}$$
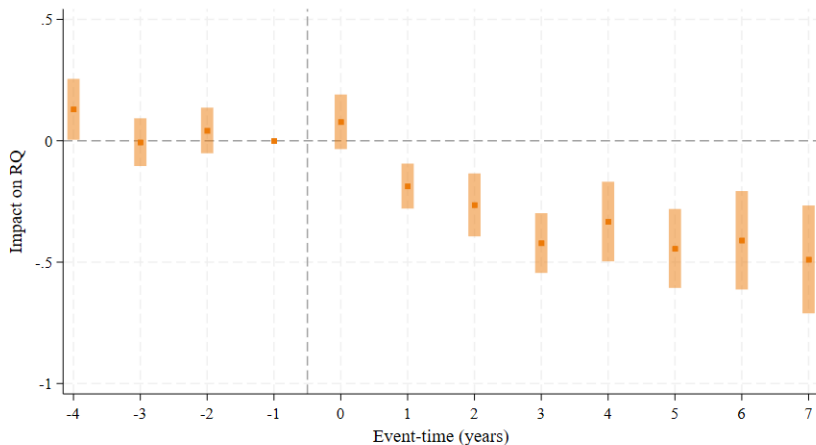
Robustness: First born boys vs. girls

Robustness: Psychology measures
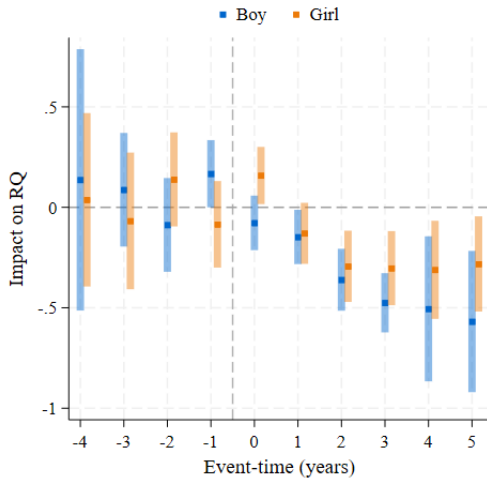
(a) Satisfaction RDAS
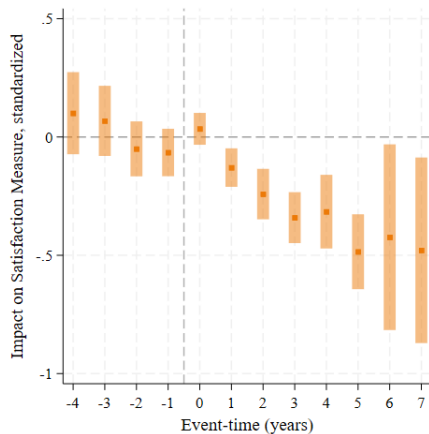
(b) Cohesion RDAS
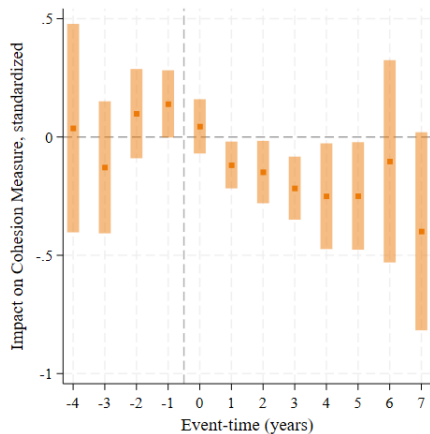
Distribution of Subjective and Time RQ

(a) Subjective RQ

(b) Time RQ

Mean values (sd):
Before 0.231 (0.86)
After -0.087 (1.01)

Mean values (sd):
Before 0.458 (0.82)
After -0.036 (0.91)
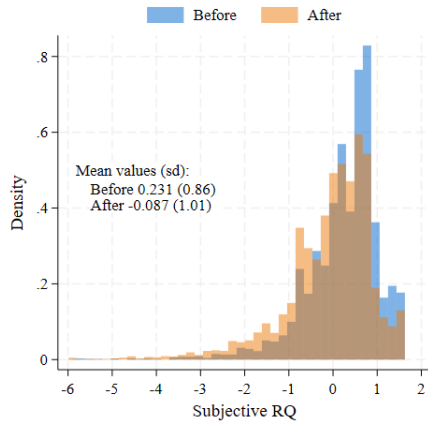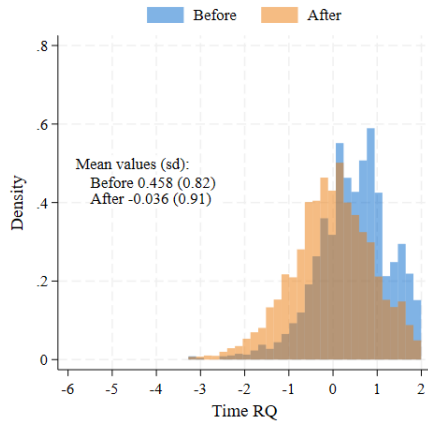
Impact per item: Subjective assessment
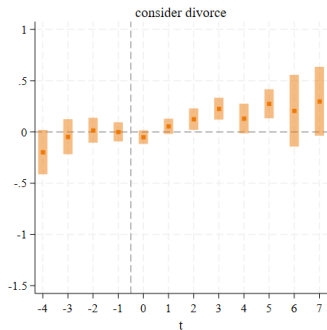
(a) consider splitting   (b) regret getting married   (c) quarrel
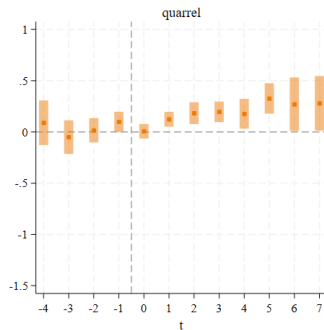
Impact per item: Subjective assessment

(a) get on each other's nerves
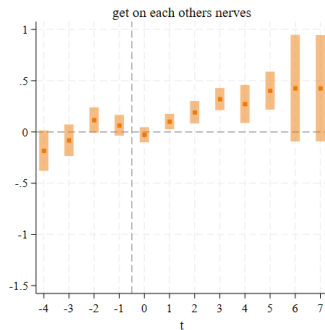
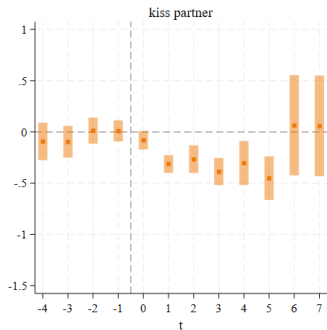## (b) degree of happiness

Impact per item: Couple time use
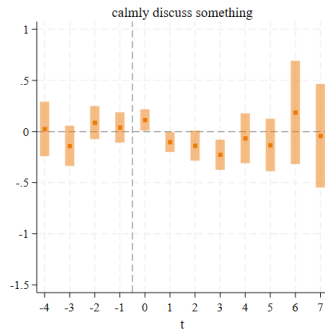
(a) kiss

kiss partner
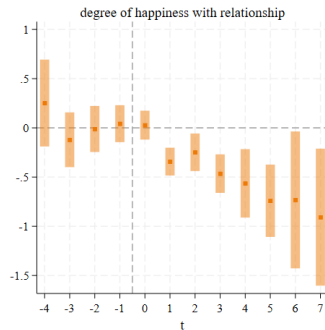
(b) outside interests

engage in outside interests

(c) exchange ideas
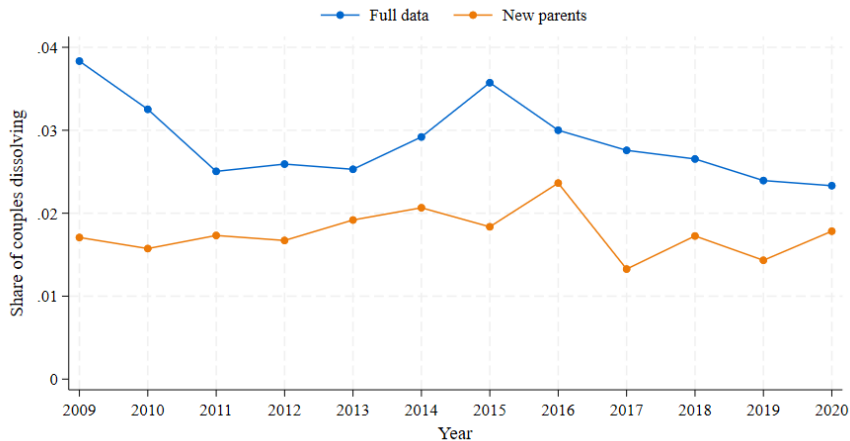

stimulating exchange of ideas

Impact per item: Couple time use
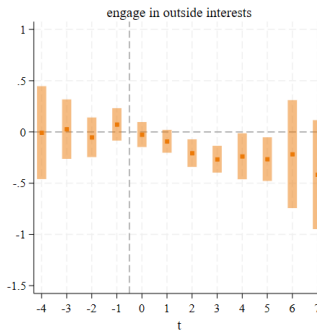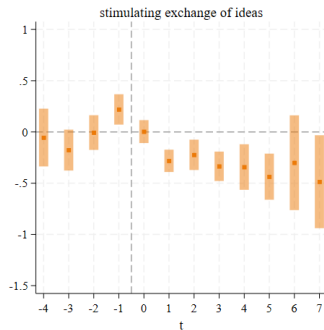
(a) work together on a project   (b) calmly discuss something
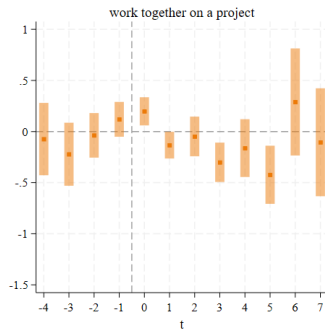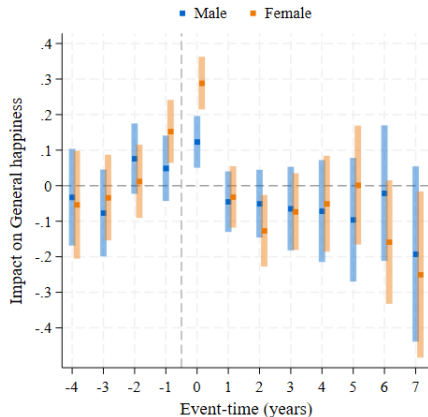
RQ and couple dissolution

- On average, 1.44% of the married couples in fertility ages (20-45) living in England and Wales divorce every year in 2009-2021 [Office for National Statistics, 2022]

General happiness: "Have you recently been feeling reasonably happy, all things considered?"

(a) Impact by sex

(b) Life-cycle profile
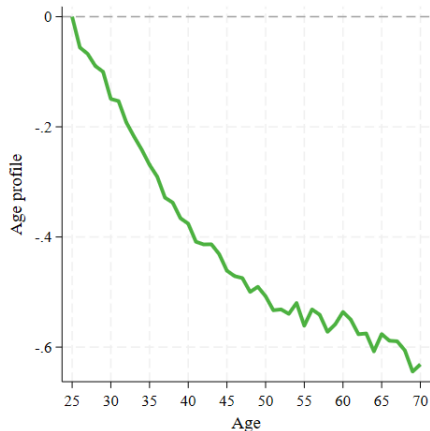
General happiness and RQ

Association in sample of never parents

	Dependent variable: General Happiness		
	(1)	(2)	(3)
RQ	0.222***	0.206***	0.185***
	(0.011)	(0.012)	(0.019)
Controls		✓	✓
Individual FE			✓
R-squared	0.047	0.069	0.033
Observations	18231	14953	14953

Timing around unemployment event
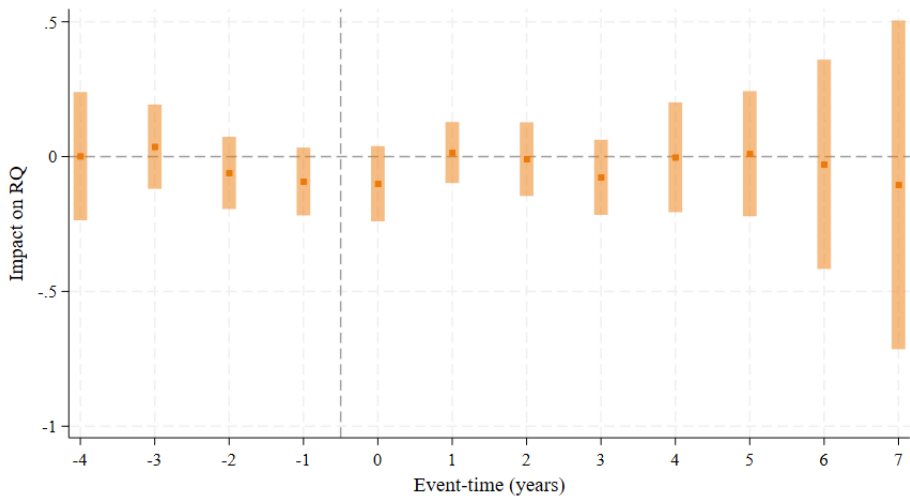
Gender differences in impact on RQ

RQ difference = Wife RQ - Husband RQ
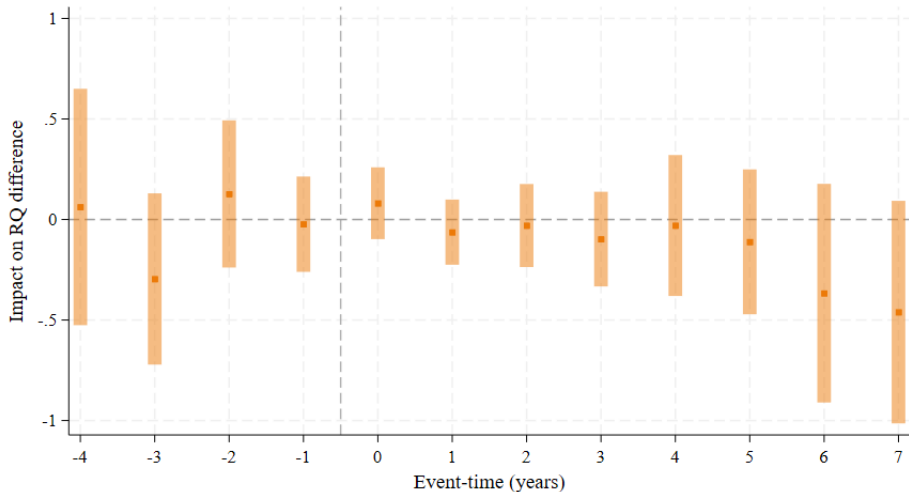
Summary statistics by couple type, before birth

|	Traditional	Unbalanced	Egalitarian	Counter-tradit.
Age	30.31	31.34	31.31	31.33
	(5.746)	(5.139)	(4.870)	(5.383)
College educated (%)	32.75	41.00	46.15	45.80
	(46.98)	(49.21)	(49.90)	(49.87)
Active in labor mkt (%)	92.03	95.65	99.83	94.74
	(27.01)	(20.40)	(4.181)	(22.35)
Employed (%)	87.66	94.23	98.95	92.92
	(32.84)	(23.33)	(10.20)	(25.67)
RQ	0.258	0.165	0.520	0.391
	(1.006)	(0.736)	(0.585)	(0.853)
Tenure	4.539	4.824	4.679	4.749
	(3.267)	(3.085)	(2.816)	(2.995)
Married (%)	65.73	70.36	65.68	68.23
	(46.99)	(45.09)	(47.28)	(46.25)
Monthly household income	3866.9	4220.8	4631.9	4500.1
	(2290.6)	(2253.4)	(2266.8)	(2425.8)
Observations	458	1058	572	551

Household specialization: Changes in time use
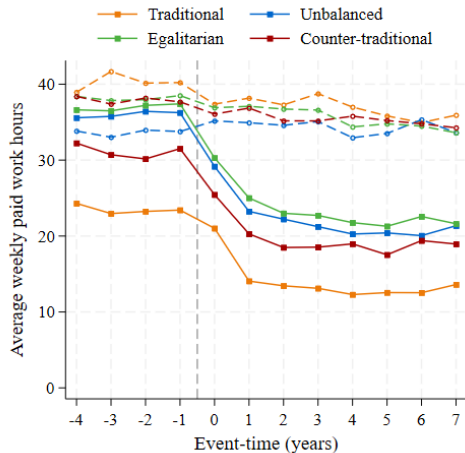
(a) Paid work hours

(b) Unpaid housework hours
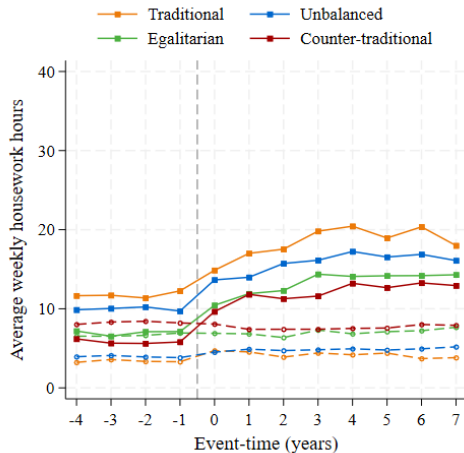
$$y_{i,t} = \alpha_i + \mu_t + \delta D_{i,t} + u_{i,t}$$

- $D_{i,t} = 1$ if i has already had the first child in period t
- Estimated through Callaway and Sant'Anna [2021] separately by couple type
- *Assume:* Treatment effect homogeneity with time relative to event
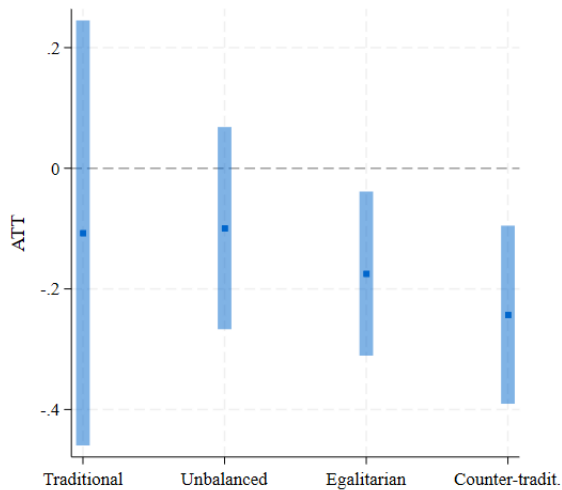 - ▶ Not plausible in this context

Coefficient as a percentage of the pre-birth mean

|	Traditional	Unbalanced	Egalitarian	Counter-traditional
Baseline RQ	0.345 (0.993)	0.424 (0.749)	0.568 (0.633)	0.459 (0.784)
ATT	-0.107 (0.180)	-0.0992 (0.086)	-0.175* (0.069)	-0.243** (0.075)
Percentage	31.01	23.40	30.81	52.94
Observations	273	876	611	856

Coefficient plot

Controlling for observables

Education, labor force activity, employment, household income, marital status

	Traditional	Unbalanced	Egalitarian	Counter-traditional
Baseline RQ	0.345 (0.993)	0.424 (0.749)	0.568 (0.633)	0.459 (0.784)
ATT	0.314 (0.191)	-0.0750 (0.092)	-0.862* (0.337)	-0.546*** (0.149)
Observations	273	876	611	856

Coefficient as a percentage of the pre-birth mean

Controlling for baseline...

■ housework share   ■ labor market work share   ■ both
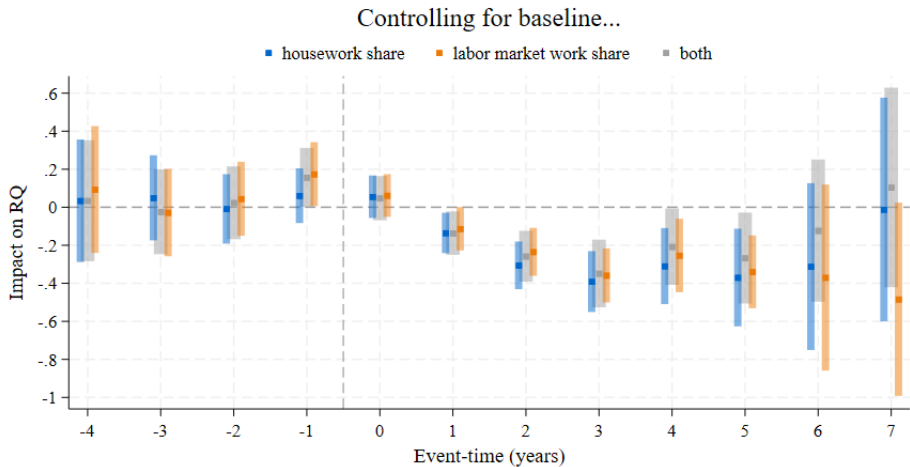
References:

Aguiar, M. and Hurst, E. (2007). Measuring trends in leisure: The allocation of time over five decades. *The Quarterly Journal of Economics*, 122(3):969–1006.

Aguilar-Gomez, S., Arceo-Gomez, E., and De la Cruz Toledo, E. (2019). Inside the black box of child penalties: Unpaid work and household structure. *Available at SSRN 3497089*.

Ahammer, A., Glogowsky, U., Halla, M., and Hener, T. (2023). The parenthood penalty in mental health: Evidence from Austria and Denmark.

Akerlof, G. A. and Kranton, R. E. (2000). Economics and identity. *The Quarterly Journal of Economics*, 115(3):715–753.

Alon, T., Doepke, M., Olmstead-Rumsey, J., and Tertilt, M. (2020). The impact of COVID-19 on gender equality. Technical report, National Bureau of Economic Research.

Amato, P. R. and Booth, A. (2001). The legacy of parents' marital discord: consequences for children's marital quality. *Journal of personality and social psychology*, 81(4):627.

Antler, Y., Bird, D., and Fershtman, D. (2022). *Learning in the marriage market: The economics of dating*. Centre for Economic Policy Research.

Avdic, D. and Karimi, A. (2018). Modern family? paternity leave and marital stability. *American Economic Journal: Applied Economics*, 10(4):283–307.

Becker, G. S. (1991). *A treatise on the family: Enlarged edition*. Harvard university press.

Bertrand, M. (2020). Gender in the twenty-first century. In *AEA Papers and Proceedings*, volume 110, pages 1–24. American Economic Association 2014 Broadway, Suite 305, Nashville, TN 37203.

Bertrand, M., Kamenica, E., and Pan, J. (2015). Gender identity and relative income within households. *The Quarterly Journal of Economics*, 130(2):571–614.