

INDEPENDENT THINKING AND HARD
WORKING, OR CARING AND WELL
BEHAVED? SHORT- AND LONG-TERM
IMPACTS OF GENDER-IDENTITY NORMS

Núria Rodríguez-Planas

City University of New York (CUNY), Queens College

Anna Sanz-de-Galdeano

University of Alicante and IZA

Anastasia Terskaya

University of Alicante

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GENDER CONVERGENCE

- Men's and women's lives have converged considerably in the past century in the US, as in many other developed countries.
- Gender gaps have decreased (and sometimes reversed) in:
 - In education
 - In LFP
 - In wages
 - **And** in risky behaviors
- One relevant explanation for this convergence: the evolution of gender identity.

GENDER IDENTITY

- Identity: a person's self-image and his/her sense of belonging to a social category (Akerlof and Kranton, 2000, 2002 and 2005)
- Two social categories, "men" and "women"
- Norms as to how individuals should behave depend on their social category, so deviating from such norms decreases utility

GENDER IDENTITY

- Women: traditionally thought of as *“generally weak, careful, obedient, socially responsible and sensible, well-behaved, and anxious about and responsive to others’ opinion”*. Men: *“independent, daring, and fearless, inherently curious, and holders of relaxed attitudes”* (Sznitman, 2007)
- Women: childrearing, caretakers, domestic tasks. Men: breadwinners, hard work, independent thinking, persistency, strength, willingness to take risks

MAIN IDEA AND ADDED VALUE

- More gender-equal norms may reduce the gender gap in risky behaviors (traditionally more prevalent among men) by:
 - Reducing men's engagement (as the identity loss of doing so is smaller) and/or...
 - Increasing women's engagement (as the identity loss of doing so is smaller)
- We study the causal effect of gender-identity norms on the gender gap in risky behaviors from adolescence into early adulthood
- We estimate the impact of gender-identity norms on the gender gap in labor market outcomes in adulthood
- Our work delivers a broader picture of the role played by gender identity norms, showing that: their effects start early on, they expand beyond family and labor-market outcomes, and there are relevant impacts for males too!

EMPIRICAL EVIDENCE ON THE EFFECTS OF GENDER IDENTITY

- Positive effects of source country LFP (Fernandez and Fogli, 2006; Blau et al., 2013), education (Blau et al., 2013) and fertility (Fernandez and Fogli, 2006 and 2009; Blau et al., 2013) on these outcomes for second-generation immigrant women living in the US.
- Effects of the source country gender gaps in wages (Antecol 2001), LFP (Antecol 2000) and smoking (Rodríguez-Planas and Sanz-de-Galdeano, 2017) on the same gaps for immigrants living in the same host country.
- Olivetti, Patacchini and Zenou (2018): higher female LFP if grademates' mothers in high school worked more hours.

EMPIRICAL EVIDENCE ON THE EFFECTS OF GENDER IDENTITY

- Papers using more direct measures of gender identity norms:
 - Fortin (2005): gender identity norms (as measured by statements such as “being a housewife is just as fulfilling as working for pay” and “when jobs are scarce, men should have more right to a job than women”) are strong predictors of women’s labor market outcomes across 25 OECD countries
 - Pope and Sydnor (2010): the gender gap in high achievement on test scores is larger in US states where there is more agreement with statements such as “women are better suited for the home” and “math is for boys”
 - Bertrand, Kamenika and Pan (2015): the social norm “a man should earn more than his wife” affects the distribution of relative income within households, women’s labor supply and their income conditional on working, the patterns of marriage and divorce, and the division of home production

MAIN RESULTS

Using idiosyncratic variation in the proportion of mothers of high-school grademates with non-traditional gender identity across adjacent grades within schools, we find:

- Strong evidence that the relaxation of traditional gender norms reduces the gender gap in risky behaviors in the short and medium term
- Evidence of convergence in the labor market (in annual earnings and welfare dependency) in early adulthood

ADD HEALTH

- The National Longitudinal Study of Adolescent to Adult Health (Add Health) is a **school-based longitudinal survey** of the US population of 7th-12th graders during school year 1994/1995.
- Waves: I (94/95), III (00/01), IV (06/07)
- Within each school and grade, a subsample of approx. 17 females and 17 males was randomly selected. Then, minority students were oversampled.
- Focus on youths attending high school in Wave I (grades 9-12). Average ages: 17 (W1), 23 (W3) and 29 (W4).

MEASURE OF GENDER IDENTITY NORMS

- At the grade level, we measure gender identity norms as:
 - The proportion of non-traditional mothers who think that to “*think for herself or himself*” or “*work hard*” is the most important thing for **both** a girl **and** a boy to learn (vs. to “*be well-behaved*”, “*be popular*” or “*help others*”)
 - Traditionally masculine vs. traditionally feminine skills.

CORRELATION OF OUR MEASURE WITH OTHER VARIABLES RELATED TO GENDER NORMS

		At the Individual Level:		At the County Level:	
Works	0.0645*** (0.00707)	Talks to child about moral issue of sex	-0.0695*** (0.00824)	FLFP	0.000803** (0.000405)
Hours worked	2.185*** (0.325)	Talks to child about negative social impact of sex	-0.0685*** (0.00777)	FLF opportunity index	0.000913*** (0.000191)
Completed college	0.112*** (0.00776)	Only male works in the couple	-0.0450*** (0.00814)	Child/Woman ratio (age 15-24)	-0.0131*** (0.00164)
Works outside home	0.0698*** (0.00739)	Better educated than the spouse	0.0181** (0.00922)	Child/Woman ratio (age 25-34)	-0.00963*** (0.00362)
				Child/Woman ratio (age 45+)	-0.00374 (0.00570)

THE MODEL

We estimate:

$$Y_{igs,w} = \beta_0 + \beta_1 \text{Female}_{igs} + \beta_2 \text{NonTraditionalMothers}_{-igs,1} + \beta_3 (\text{NonTraditionalMothers}_{-igs,1} * \text{Female}_{igs}) + X'_{igs,1} \alpha + G'_{gs,1} \phi + \delta_g + \rho_s + \pi_s(\text{Grade}_g) + \epsilon_{igs,w}$$

- i denotes individuals, g denotes grades, s denotes schools, w denotes the survey wave
- $\text{NonTraditionalMothers}_{-igs,1}$ is the proportion of students in grade g and school s whose mothers gender-identity is non-traditional
- $X'_{igs,1}$ is a vector of individual characteristics
- $G'_{gs,1}$ is a vector of characteristics of a grade g in school s
- Grade and school fixed effects are denoted by δ_g and ρ_s
- $\pi_s(\text{Grade}_g)$ are school-specific time trends.

CONTROL VARIABLES

- In our main specification we control for:
 - Individual background characteristics: age, race, verbal ability (PPVT), residential building quality, parental age, parental education and family structure
 - School/grade characteristics: grade size, average age, share of minorities, share of females, average PPVT

BACK TO THE MODEL

$$Y_{igs,w} = \beta_0 + \beta_1 \text{Female}_{igs} + \beta_2 \text{NonTraditionalMothers}_{-igs,1} + \beta_3 (\text{NonTraditionalMothers}_{-igs,1} * \text{Female}_{igs}) + X'_{igs,1} \alpha + G'_{gs,1} \phi + \delta_g + \rho_s + \pi_s(\text{Grade}_g) + \epsilon_{igs,w}$$

- The main coefficient of interest is β_3 .
- β_3 captures the effect of an increase in the proportion of non-traditional mothers on the gender gap in Y
- If β_3 is positive \Rightarrow a higher proportion of non-traditional mothers is associated with higher engagement in risky behavior Y among girls relative to boys \Rightarrow smaller male-female gender gap
- β_2 captures the effect for boys; $\beta_2 + \beta_3$ captures the effect for girls

IDENTIFICATION

- Including school fixed effects controls for selection of individuals into schools schools
- Grade fixed effects are included too
- To control for time-varying unobserved factors that are also correlated with the changes in grade composition within schools, we include school trends.
- Hence, identification is based on the deviation in the proportion of grade-mates' non-traditional mothers across grades from its school long-term trend.

IDENTIFICATION

- Our estimation strategy requires:
 - Enough variation across grades within schools in maternal gender-identity norms.
 - This variation should be “as good as random” to make causal statements.

VARIATION IN COHORT COMPOSITION MEASURE

Raw grade variables				
	Mean	SD	Min	Max
% of non-traditional mothers	0.682	0.134	0.235	1.000
Residuals after removing grade and school fixed effects				
	Mean	SD	Min	Max
% of non-traditional mothers	-0.000	0.081	-0.404	0.284
Residuals after removing grade fixed effects, school fixed effects and school trends				
	Mean	SD	Min	Max
% of non-traditional mothers	-0.000	0.068	-0.224	0.328
Observations	8181			

VALIDITY: “AS GOOD AS RANDOM” VARIATION?

- First, being in one grade or another is mostly beyond one's control
- Second, there should be no systematic differences in the variation of grade-mates mothers' gender-identity across grades.
- Our conjecture is that after removing grade and school fixed effects, as well as school trends, such systematic differences should no longer be relevant

VALIDITY: “AS GOOD AS RANDOM” VARIATION?

- We run Monte Carlo simulations as in Lavy and Schlosser (2011).
 - Randomly generate a “non-traditional mother” dummy and compute placebo proportions of non-traditional mothers for each school and grade
 - Compute simulated within-school standard deviations of the proportion of non-traditional mothers
 - Repeat this procedure 1000 times
- Compute empirical 90 percent CI for each within school SD using simulated data. More than 90% of schools have an actual SD that falls within this interval

BALANCE TESTS

- Regress main background characteristics on the proportion of non-traditional mothers and school and grade fixed effects

Variable	% of non-trad. mothers	% of non-trad. mothers*Female	Variable	% of non-trad. mothers	% of non-trad. mothers*Female
White	-0.039 (0.057)	0.082 (0.061)	Log family income	-0.048 (0.108)	0.174 (0.109)
Black	0.053 (0.045)	-0.037 (0.054)	Number of siblings	0.061 (0.274)	-0.448 (0.343)
Hispanic	-0.012 (0.052)	-0.049 (0.049)	Mother born in the US	-0.030 (0.061)	0.091 (0.064)
PVT	-4.823* (2.757)	2.075 (2.673)	Mother smokes	-0.010 (0.101)	-0.068 (0.118)
High quality residential building	-0.063 (0.111)	0.087 (0.115)	Father smokes	0.020 (0.101)	-0.146 (0.148)
Both parents live in hh	0.141 (0.101)	-0.121 (0.095)	Mother is a college graduate	0.058 (0.070)	-0.010 (0.074)
Parental age	1.160 (1.399)	0.071 (1.584)	Father is a college graduate	0.038 (0.079)	0.027 (0.088)

Note: OLS coefficient estimates and their associated standard errors clustered by school in parentheses.

All regressions include school and grade fixed effects and a female dummy. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

MAIN OUTCOMES

- Risky-behavior indicators based on computer-assisted self interviews (CASI):
 - Regular smoker (Waves I, III, IV)
 - Got drunk during past 12 months (Waves I, III, IV)
 - Ever tried marijuana (Waves I, III, IV)
 - Ever tried other illegal drugs (Waves I, III, IV)
 - Ever expelled from school (Waves I, III)
 - Had sex before 16 (Wave III)

- Socioeconomic outcomes measured at wave IV:
 - Ever worked for pay full time
 - Welfare recipient
 - Individual earnings

MULTIPLE OUTCOMES PROBLEM

- Since we are analyzing many outcomes, Type I error is more likely.
 - We construct a **summary index** as in Kling, Liebman and Katz (2007) among others.
 - We group outcomes into meaningful categories by survey waves (Heckman et al., 2010)
 - The summary index is defined as an equally weighted average of z-scores of its components. If one index contains adverse and beneficial outcomes, we switch the signs of adverse outcomes
 - To obtain results for each specific outcome we **adjust p-values** for multiple hypotheses testing using Romano and Wolf's (2005) procedure.

DESCRIPTIVE STATISTICS

Wave I	Female	Male	Diff.
Regular smoker	0.217 (0.412)	0.218 (0.413)	-0.002 (0.009)
Got drunk during the past year	0.361 (0.480)	0.398 (0.490)	-0.038*** (0.011)
Ever tried marijuana	0.329 (0.470)	0.373 (0.484)	-0.044*** (0.011)
Ever tried other illegal drugs	0.139 (0.346)	0.147 (0.354)	-0.008 (0.008)
Expelled from school	0.024 (0.153)	0.068 (0.252)	-0.044*** (0.005)
Observations	4404	3777	

DESCRIPTIVE STATISTICS

Wave III	Female	Male	Diff.
Regular smoker	0.290 (0.454)	0.323 (0.468)	-0.034*** (0.010)
Got drunk during the past year	0.488 (0.500)	0.601 (0.490)	-0.113*** (0.011)
Ever tried marijuana	0.551 (0.497)	0.635 (0.481)	-0.084*** (0.011)
Ever tried other illegal drugs	0.260 (0.439)	0.336 (0.472)	-0.076*** (0.010)
Expelled from school	0.046 (0.210)	0.133 (0.340)	-0.087*** (0.006)
Had sex before 16	0.305 (0.460)	0.277 (0.448)	0.028*** (0.010)
Observations	4404	3777	

DESCRIPTIVE STATISTICS

Wave IV	Female	Male	Diff.
Regular smoker	0.255 (0.436)	0.315 (0.465)	-0.060*** (0.010)
Got drunk during the past year	0.411 (0.492)	0.569 (0.495)	-0.157*** (0.011)
Ever tried marijuana	0.617 (0.486)	0.717 (0.450)	-0.101*** (0.010)
Ever tried other illegal drugs	0.317 (0.465)	0.438 (0.496)	-0.121*** (0.011)
Ever worked for pay full time	0.953 (0.212)	0.967 (0.178)	-0.014*** (0.004)
Personal income (1000 US dollars)	30.764 (37.117)	43.566 (41.453)	-12.801*** (0.890)
Welfare recipient	0.259 (0.438)	0.164 (0.371)	0.095*** (0.009)
Observations	4404	3777	

RESULTS FOR SUMMARY INDICES

TABLE: The Effect of Mothers of Grademates' Gender-Identity Norms on the Gender Gap. Summary Indices

	Risky W1	Risky W3	Risky W4	Labor W4
% non-traditional mothers	-0.300*	-0.328**	-0.162	-0.0244
	(0.172)	(0.137)	(0.162)	(0.135)
% of non-traditional mothers* Female	0.486***	0.361***	0.222	0.317**
	(0.138)	(0.128)	(0.166)	(0.149)
B1+B2 (effect for females)	0.186	0.0324	0.0591	0.292**
	(0.130)	(0.123)	(0.155)	(0.136)
Observations	8,181	8,181	8,181	8,181
R-squared	0.123	0.123	0.154	0.141

Note: standard errors clustered at school level in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

TABLE: The Effect of Mothers of Grademates' Gender-Identity Norms on the Gender Gap in Risky Behaviors and Labor Market Outcomes

Dependent variable:	W1		W3		W4	
	% of non-traditional mothers	% of non-traditional mothers *Female	% of non-traditional mothers	% of non-traditional mothers *Female	% of non-traditional mothers	% of non-traditional mothers* Female
Regular smoker	-0.073 (0.082)	0.148** (0.074)	-0.182* (0.102)	0.119 (0.093)	-0.164 (0.106)	0.162 (0.105)
Got drunk during the past 12 months	-0.145 (0.122)	0.260** (0.106)	-0.108 (0.136)	0.104 (0.111)	-0.094 (0.120)	0.092 (0.109)
Ever tried marijuana	-0.136 (0.129)	0.252** (0.121)	-0.207* (0.124)	0.240** (0.113)	-0.129 (0.109)	0.224** (0.109)
Ever tried other illegal drugs	-0.083 (0.081)	0.090* (0.052)	-0.041 (0.114)	-0.006 (0.116)	0.089 (0.108)	-0.070 (0.109)
Ever expelled from school	-0.094 (0.065)	0.140*** (0.052)	-0.156** (0.072)	0.223*** (0.063)		
Had sex before 16			-0.129 (0.125)	0.193* (0.112)		

Note: Standard errors clustered at school level in parentheses. No. of observations: 8181.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$, in bold if Romano-Wolf $p < 0.1$

MAIN RESULTS - RISKY BEHAVIORS

- Exposure to non-traditional norms in high school (Wave I) reduces the gender gap in risky behaviors in the short and medium term, and, in some case (marijuana), even in the long run.
- Result due to two opposite effects: when exposed to non-traditional norms, girls engage more in risky behaviors, while boys engage less in risky behaviors (although absolute effect only significant for boys)
- “Got drunk” Wave I prevalence: 39.8% (boys) and 36.1% (girls), so the gender gap is 3.7 p.p. If the proportion of non-traditional grademates' mothers increased by 10 p.p, the gender gap would decrease by 2.60 p.p, that is, 70% of the raw gender gap

TABLE: The Effect of Mothers' of Grademates beliefs on the Gender Gap in Labor Market Outcomes. Wave IV

Dependent variable:	% of non-traditional mothers	% of non-traditional mothers*Female
Ever worked for pay full time	0.039 (0.038)	0.001 (0.044)
Log of personal income	-0.543 (0.608)	1.405** (0.691)
Welfare recipient	0.037 (0.111)	-0.189** (0.082)

Standard errors clustered at school level in parentheses.

No. of observations: 8181.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$, in bold if Romano-Wolf $p < 0.1$

MAIN RESULTS - WELFARE

- Non-traditional gender-identity norms decrease the gender gap in welfare dependency (by reducing women's welfare dependency)
- 16.5% of males and 26% of females reported to be welfare recipient at Wave IV, so the gender gap is 9.5 p.p. If the proportion of non-traditional classmates' mothers increased by 10 p.p, the gender gap would decrease by 1.9 p.p, that is, 20% of the raw average gap

MAIN RESULTS - EARNINGS

- Non-traditional gender-identity norms decrease the gender earnings gap (by increasing women's earnings)
- Males and females report annual earnings of \$43,566 and \$30,764, respectively, so the gender earnings gap is \$12,801. If the proportion of non-traditional mothers increased by 10 p.p., the gender earnings gap is reduced by 14%

ATTRITION AND OVERSAMPLING OF MINORITIES

- Attrition. Is it systematically correlated with our measure of gender-identity norms?
 - We regress an attrition dummy on a female dummy, the proportion of non-traditional mothers, its interaction with the female dummy, school fixed effects and grade fixed effects
 - The estimated coefficients on the proportion of non-traditional mothers and on its interaction with the female dummy are neither individually nor jointly statistically significant
- Minorities are oversampled in Add Health.
 - The distribution of mothers' gender-identity norms is almost identical in the core sample and the full sample
 - We obtain very similar results when using the core sample only

SELECTIVE DELAY/ANTICIPATION

- What if there is selective delay/anticipation? We assumed so far that there is no selection into grades within school based on maternal gender-identity norms
- We obtain very similar results when using an alternative peer group definition based on birth date rather than grade.

PLACEBO RUNS

- Are our results driven by chance?
- Unlikely: Monte Carlo simulations: we randomly generate data on maternal gender identity and only obtain significant results in less than 5% of cases

CONCLUSIONS

- We find strong evidence that the relaxation of traditional gender-identity norms reduces the gender gap in:
 - a) risky behaviors (traditionally more prevalent among males) during adolescence, mostly by decreasing boys' engagement.
 - b) labor-market outcomes in early adulthood, by increasing women's earnings and reducing their welfare dependence

MECHANISMS

- Being exposed to a more egalitarian culture appears to reduce the costs of deviating from traditional masculine/feminine traits and prescriptions for boys/girls. How so exactly? Some suggestive evidence:
 - It increases the probability that girls (relative to boys) go with their "gut feeling" without thinking too much of the consequences when making decisions
 - Girls are less likely to think that if they had sex that would upset their mothers and that if they got pregnant it would be an embarrassment for their families.