Gender Stereotyping in Sports

By MIRIAM MARCÉN, MARINA MORALES, AND ALMUDENA SEVILLA *

Gender differences in academic achievement have dramatically reversed in the last decades. In the United States whereas in the 1960s there were 1.6 men for every woman graduating from four-year colleges, there are now 1.35 women for every man (Goldin, Katz, and Kuziemko 2006). Despite this progress, important gender differences in some areas persist. For example, girls continue to perform relatively worse than boys in mathematics, particularly at the top of the ability distribution (Guiso et al. 2008; Pope and Sydnor 2010). Similarly, boys participate in school sports to a greater extent than girls. Whereas 60 per cent of high school boys participate in sports, only 45 per cent of girls do (Stevenson 2007).

Understanding gender differences in sport participation during high school can inform the design of public policies aimed at narrowing gender gaps in education and the labor market. Practicing sports during high school is causally associated with better labor market outcomes later in life, increasing men and women's wages by 8 per cent as long as 15 years after high school graduation (Stevenson 2010). Beyond the direct physiological benefits, sports can foster the acquisition of important skills such as the ability to cooperate, compete, and team work, which are likely to be valued in the market later on. This paper contributes to this literature by investigating how gender stereotypes and parental time investments shape sport choices of boys and girls during high school.

I. Gender Stereotype Defier (GSD) Index

Following the passage of Title IX in 1972, which required schools to provide equal access to all sport activities by 1978, the number of high-school girls participating in sports as a percentage of female high-school enrollment increased ten-fold from close to 3 in 100 girls in

* Marcén: Department of Economics, Universidad de Zaragoza, Zaragoza, Spain, (e-mail: mmarcen@unizar.es). Morales: Department of Economics, Universidad de Zaragoza, Zaragoza, Spain, (e-mail: mcmorales@unizar.es). Sevilla: Department of Social Sciences, UCL, London. (e-mail: a.sevilla@ucl.ac.uk). The authors declare that they have no relevant or material financial interests that relate to the research described in his paper. Corresponding author: Marina Morales

1972 to almost 30 in 100 girls in 1978 (Stevenson 2007). However, the increase in female participation in sports was not homogeneous across all sports. Although the legislation did not make any stipulation about the type of sports to be taken on by girls, girls stayed away from highly popular male-dominated sports such as football and baseball. Instead new sports emerged such as softball and volleyball that rapidly became female-dominated. At the same time, the number of boys participating in less popular sports such as field hockey and gymnastic dramatically dropped following the sharp rise in participation by girls in these sports (Stevenson 2007).

In order to measure the extent to which boys and girls deviate from their gender-dominated sport in a given state, we use publicly available data from the 2002/2003 to 2018/2019 National Federation of State High School Associations (NFHS), which contains information on the number of players by sport and by gender in US schools (see Table A1). Our sample consists of 128,294,593 high school students, about three million girls and four and a half million boys per year playing 91 sports across 19,500 schools over this period and covering about 80 per cent of all students enrolled in high school.

We consider a sport to be female(male)-dominated if over the analyzed period the proportion of girls(boys) playing a sport (over all the players in that sport) is over 80 per cent, and choose a national cut-off of 80 per cent as a conservative threshold. Considering a national-level, as opposed to a state-level threshold, makes sense since professional leagues are national labor markets. Our results are robust to thresholds of 70 per cent and 60 per cent (see Tables A2 and A3).

Out of the 91 sports listed by the NFHS over this period, there are 15 female-dominated sports (dance, dance team (high kick), dance team (jazz), dance/drill, field hockey, cheer leader, drill team, equestrian, figure skating, flag football, gymnastics, synchronized swimming, volleyball, heptathlon and softball), and 11 male-dominated sports (American

football (6, 8, 9 or 11 players), baseball, rugby, bass fishing, ice hockey, adaptive golf, native youth Olympics and wrestling).

We follow a similar methodology to Pope and Sydnor (2010), who construct a similar deviance index in mathematics, and first construct the relative share of girls doing male-dominated sports (GSD_j^m) as follows:

$$(1) \quad GSD_j^m = \left(\frac{\frac{\sum_{i=1}^{NF_j} I_{i,j}^m}{NF_j}}{\frac{\sum_{i=1}^{NM_j} I_{i,j}^m}{NM_j}} \right)$$

where NF_j and NM_j are the number of girls and boys in our sample who play sports in high school in state j over this period. $I_{i,j}^m$ takes value 1 if an individual i plays a male-dominated sport and 0 otherwise. The numerator is the share of girls who play a male-dominated sport (relative to the total number of girls playing sports). The denominator is the share of boys who play a male-dominated sport (relative to the total number of boys playing sports). Higher values of GSD_j^m represent breaking with stereotypes in the choice of sports either as a result of more girls playing male-dominated sports, or fewer boys playing male-dominated sports. The relative share of boys doing female-dominated sports is captured by GSD_j^f and is constructed in a symmetrical way to GSD_j^m.[1]

For each state, we construct a *Gender Stereotype Defier* **(**GSD) sports index as an average of the relative share of girls participating in male-dominated sports (GSD_j^m) and the relative share of boys participating in female-dominated sports (GSD_j^f), as follows:

$$(2) \quad GSD_j = \frac{\left[\sum_k^{m,f} GSD_j^k\right]}{2}$$

where j is state and k refers to either male-dominated (m) or female-dominated sport (f).

[1] Similarly, $GSD_j^f = \left(\frac{\frac{\sum_{i=1}^{NM_j} I_{i,j}^f}{NM_j}}{\frac{\sum_{i=1}^{NF_j} I_{i,j}^f}{NF_j}} \right)$

Values of the GSD_j sports index closer to 1 indicate a higher probability that girls and boys break stereotypical gender patterns in the choice of sport. Values closer to 1 may either result from the share of girls playing male-dominated sports being similar to the share of boys playing male-dominated sports, i.e. $GSD_j^m = 1$, or from the share of boys playing female-dominated sports being similar to the share of girls playing female-dominated sports, i.e. $GSD_j^f = 1$.[2] The values of the GSD sports index range from 0 to 0.17, with an average of 0.027 and standard deviation of 0.032. This average is far from 1, indicating that the share of boys(girls) playing a male(female)-dominated sport is 37 times the share of girls(boys) playing a male(female)-dominated sport.[3]

II. Gender Roles and Stereotyping in Sports

Figure 1 shows that the national average of the GSD sports index exhibits a high level of heterogeneity across states. An *F*-test rejects the null hypothesis that the rates at which boys and girls participate in sports dominated by the opposite gender are the same across states, with *p*-values below 0.05 in every case.[4] At the 95th percentile, the state with the largest GSD sports index is Hawaii (0.17), where boys (girls) are 6 times more likely than girls (boys) to play a male (female)-dominated sport. The two states with the lowest value GSD sports index are Alabama and South Carolina, followed closely by West Virginia and Indiana, where hardly any children play sports dominated by the opposite sex.

Despite large cross-state differences in the GSD sports index, the rates at which boys and girls participate in a sport that is dominated by the opposite gender remain quite persistent over time, with no sign of convergence across states over this two-decade period. Formally, analyses of the R^2 resulting from regressions that relate the GSD sports index to state and year fixed effects shows that additionally controlling by the interaction of state and year

[2] GSD_j^m and GSD_j^f are highly correlated with the GSD_j sports index with a Pearson correlation coefficients of 0.70 and 0.88 respectively.

[3] For example, if we focus on male-dominated sports, then $GSD_j^m = 0.027$ translates into $\frac{\sum_{i=1}^{NM_j} I_{ij}^m}{NM_j} = 37 \frac{\sum_{i=1}^{NF_j} I_{ij}^m}{NF_j}$, where 37=1/0.027.

[4] The F-test for the equality test among the GSD sports index (by year) across states is 111.84 with a p-value below 0.01.

dummies can account for an additional 2 per cent of the variation over time in state level variation in the GSD sports index. [5]

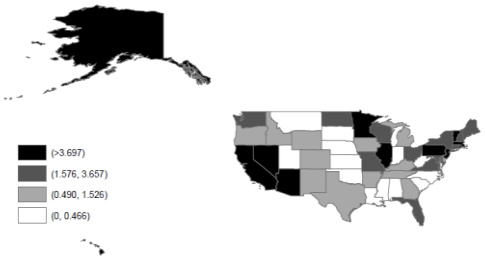

FIGURE 1: GENDER STEREOTYPE DEFIER (GSD) SPORTS INDEX ACROSS US STATES
Note: Labels represents four GSD sports index quartiles. Darker shades indicate a higher GSD sports index. The values of the GSD sports index are multiplied by 100 for ease of exposition (see Table A4).

Comparative advantage in physical abilities that differ between boys and girls emerge at age 12 (McKay et al. 2017), and there is no reason to believe that girl-boy physical differences vary by state. It is thus unlikely that the lack of convergence across states over this period can be explained by biological gender differences. Additionally, the fact that girls and boys compete against athletes of the same sex makes an explanation based on comparative advantage considerations less likely, and suggests the presence of relatively constant state-level factors behind the state variation in GSD. The GSD sports index is highest in the state where boys and girls are most likely to break gender stereotypes in the choice of sport (Hawaii, 0.17). If gender equality in sport choice is captured by a value of the GSD sports index of 1, then at least 17 per cent (1-0.17)-(1-0.027))/(1-0.027) of gender stereotypical sports choices can arguably be explained by these cross-state factors.

To investigate whether gender norms about the position of women in society may relate to gender stereotyping in sports choice, we first correlate the GSD sports index with the share of individuals that strongly agree with a gender-equal statement (or strongly disagree with a non-gender-equal statement) from the 1972-2018 General Social Survey (GSS, see Table A1). On average 50 per cent percent of respondents display gender-equal attitudes in the US

[5] The R^2 of regressions that relate the state-level GSD sports index to state and year fixed-effects only yield a R^2 of 0.887, and adding the interaction of state and year fixed effects increases the R^2 to 0.908.

over the 1972-2018 period, consistent with findings in the literature (Charles, Guryan, and Pan 2018). We also correlate the GSD sports index with state indicators on women's social and economic autonomy, political participation, women's reproductive rights, and health and well-being (1989-2006 Institute for Women's Policy Research IWPR, see Table A1).

Panel A in Table 1 provides the coeffificient estimates from a simple linear regression of the state-level gender norms indicators on the state-level GSD sports index. Girls in states more likely to deviate from the norm and do a male-dominated sport at high school also live in states with more egalitarian gender attitudes. Column 1 shows the association between the share of individuals with gender-equal attitudes and the GSD sports index. The positive coefficient of 0.005 indicates that a one standard deviation difference in the GSD sports index between states (representing approximately the difference between living in Illinois rather than Florida, or in Ohio rather than Alabama) is associated with a 1.6 percentage points change in the proportion of individuals holding gender-equal attitudes. Similarly, columns 2-5 show that a one standard deviation increase in the GSD sports index is positively related to the status of women in society for all the indicators considered, explaining between 26 percent and 60 percent of the standard deviations of the indicators of the status of women.[6] Looking at the R^2s the state-level GSD sports index accounts between 7 percent and 37 percent of the variation in gender norms. We check the robustness of our estimates to outliers such as Hawaii, and results do not change (see Table A5).

We next look at whether the GSD sports index is associated with objective measures on the position of women in society. To that end we use information from the 2002-2018 American Community Survey (ACS, see Table A1) and the 2002-2018 Current Population Survey (CPS, see Table A1) to construct state-level variables of labor force participation gender gaps, the (log) wage gender gap, the share of females never married, and the average female

[6] For example for Political participation: 3.2 (GSD sdx100) x 0.327 (coef.)=1.0464; 1.0464/4.029 (sd Political participation indicator)=0.259 (approx.26%)

age at first child. These variables have been shown to be negatively correlated with the level of sexism in a state (Charles, Guryan, and Pan 2018). Outcomes are estimated on a sample of native women aged 25-64 (Labor market outcomes) and 20-40 (non-labor market outcomes).

Panel B of Table 1 shows that an increase of one standard deviation in the GSD sports index in a state is associated with a 6.9 percent decrease in the gender gap in labor force participation.[7] Similarly, columns 3-4 show that an increase in a standard deviation of the GSD sports index is associated with a 3.2 percentage points decrease in the probability that a woman is unmarried, and a quarter of a year increase in childbearing age. States with higher values of the GSD sports index have lower gender wage gaps, although the estimate is not as efficiently estimated.

III Gender Stereotypes in Sport Choice and Parental Time Investments

This section looks at whether differences in parental time investments are related to stereotypical gender patterns in sports choice using the 2003-2018 America Time Use survey (see Table A1). We construct the time that boys and girls receive from parents as the sum of all minutes per day parents spend with the child as primary activity. Our main sample includes parents between 21 and 55 years old with at least one child aged 6 to 11 living in the household. We focus on children before the high school years because parental time investments are more important during this period than during adolescence, when children become autonomous and child's own investments matter more than that of the parents (Del Boca, Monfardini, and Nicoletti 2017). Additionally, this sample of children ensures that parental time does not capture parent's reactions to the differential rates of physical development for boys and girls that happen around the age of 12 (McKay et al. 2017).

[7] This is calculated as follows: 3.2 (GSD sdx100) x 0.200 (coef.)=0.64; 0.64/-9.335 (mean LFP Gap (Female-Male))=-0.069 (or -6.9%).

Panel C and D present the results from a siblings-FE models for fathers and mothers separately.[8] The coefficient on the female dummy in the first row of Panel C shows that fathers spend around 9 minutes less per day with daughters than with sons. The gender difference in father's time holds for the three categories of parental time investments, basic, recreational, and educational parental time investments. However, fathers living in states with a higher GSD sports index spend more time with daughters (relative to sons) than fathers living in states with a lower GSD sports index. In particular, a standard deviation increase (approximately the difference between living in Illinois rather than Florida), increases the relative time fathers spend with their daughters by 3.5 minutes per day, reducing the gender gap in paternal time by almost half. [9] Interestingly, about half of fathers' relative increase in time with daughters comes from recreational child care, which includes playing sports with children as well as attending sporting events. In contrast to fathers, there is no association between the GSD sports index and the time that mothers spend with daughters relative to sons for any of our time investment measures.

IV Conclusion

This paper documents that whereas there is a large heterogeneity in stereotypical gender choices of sports during high school across states, the rates at which boys and girls participate in a sport that is dominated by the opposite gender remains quite persistent over time. Using several sources of data over long periods of time, we present correlational evidence suggesting that the extent to which boys and girls break stereotypes when choosing which sports to practice during high school depends on how women are viewed in society. We also identify fathers' time investments as being an important cultural-transmission mechanism

[8] In particular, we estimate: $Y_{ijs} = \alpha_1 female_{j,s} + \alpha_2 female_{j,s} * GSD_s + x_{j,s} + U_{i,s} + \varepsilon_{ij}$ where *i* denotes father (mother), *j* denotes child and s indicates state. Y_{ijs} are minutes per day that a father (mother) spends with child *j*. $female_{j,s}$ is an indicator equal to one if the child *j* is a girl and zero otherwise. GSD_s is the gender stereotypical defier sports index in state s, $x_{j,s}$ captures child characteristics such as age, and $U_{i,s}$ captures household invariant characteristics. Results from an OLS regression model are qualitatively the same (see Table A6).

[9] This is calculated as 3.2 (GSD sdx100) x 1.090 (coef. GSDxFemale)=3.5; 3.5/-8.635 (coef. Female)=-0.40 (or -40%).

through which gender stereotypical patterns in the choice of sports across US states may be passed on and maintained.

REFERENCES

Boca, Daniela Del, Chiara Monfardini, and Cheti Nicoletti. 2017. "Parental and Child Time Investments and the Cognitive Development of Adolescents." *Journal of Labor Economics* 35 (2): 565–608.

Charles, Kerwin Kofi, Jonathan Guryan, and Jessica Pan. 2018. "The Effects of Sexism on American Women: The Role of Norms vs. Discrimination." 24904. NBER Working Paper.

Goldin, Claudia, Lawrence F. Katz, and Ilyana Kuziemko. 2006. "The Homecoming of American College Women: The Reversal of the College Gender Gap." *Journal of Economic Perspectives* 20 (4): 133–56.

Guiso, Luigi, Ferdinando Monte, Paola Sapienza, and Luigi Zingales. 2008. "Culture, Gender, and Math." *Science* 320 (5880): 1164–65.

McKay, Marnee J., Jennifer N. Baldwin, Paulo Ferreira, Milena Simic, Natalie Vanicek, Joshua Burns, E. Nightingale, et al. 2017. "Reference Values for Developing Responsive Functional Outcome Measures across the Lifespan." *Neurology* 88 (16): 1512–19.

Pope, Devin G., and Justin R. Sydnor. 2010. "Geographic Variation in the Gender Differences in Test Scores." *Journal of Economic Perspectives* 24 (2): 95–108..

Stevenson, Betsey. 2007. "Title IX and the Evolution of High School Sports." *Contemporary Economic Policy* 25 (4): 486–505.

———. 2010. "Beyond the Classroom: Using Title IX to Measure the Return to High School Sports." *Review of Economics and Statistics* 92 (2): 284–301.

TABLE 1—GENDER STEREOTYPING IN SPORTS, GENDER NORMS, AND PARENTAL TIME INVESTMENTS

Panel A					
	(1)	(2)	(3)	(4)	(5)
Dependent variable:	Gender-equal	Political Participation	Social and Economic Autonomy	Reproductive Rights	Health and Well-being
GSD sports index	0.005***	0.327**	0.051***	0.269***	0.031**
	(0.002)	(0.152)	(0.013)	(0.035)	(0.012)
Observations	51	50	51	51	51
R-squared	0.225	0.070	0.219	0.367	0.071
Mean	0.499	0.890	7.002	2.362	2.038
Panel B					
	(1)	(2)	(3)	(4)	
Dependent variable:	LFP Gap (Female - Male) (%)	Log Wage Gaps, conditional on working (Female-Male)	Share of Females Never married (%)	Average Female Age at First Birth	
GSD sports index	0.200**	0.009	0.997***	0.098**	
	(0.089)	(0.009)	(0.344)	(0.042)	
Observations	51	51	51	51	
R-squared	0.079	0.047	0.178	0.177	
Mean	-9.335	-0.139	45.412	23.564	
Panel C: Parental Time Investments - Fathers with children 6-11					
	(1)	(2)	(3)	(4)	
Dependent variable	Total Time (minutes per day)	Time Spent in Basic Care (minutes per day)	Time Spent in Recreational Activities (minutes per day)	Time Spent in Educational activities (minutes per day)	
Female	-8.635***	-4.425***	-3.044***	-1.166***	
	(1.479)	(1.243)	(0.667)	(0.408)	
GSD x Female	1.090***	0.525***	0.437***	0.128	
	(0.282)	(0.203)	(0.159)	(0.088)	
Observations	18,716	18,716	18,716	18,716	
R-squared	0.015	0.008	0.006	0.003	
N of households	13,609	13,609	13,609	13,609	
Mean	48.310	21.023	18.568	8.720	
Panel D: Parental Time Investments - Mothers with children 6-11					
	(1)	(2)	(3)	(4)	
Dependent variable	Total Time (minutes per day)	Time Spent in Basic Care (minutes per day)	Time Spent in Recreational Activities (minutes per day)	Time Spent in Educational activities (minutes per day)	
Female	2.901	1.343	1.201**	0.357	
	(1.827)	(1.196)	(0.535)	(1.005)	
GSD x Female	0.096	-0.105	0.079	0.122	
	(0.451)	(0.322)	(0.155)	(0.181)	
Observations	27,575	27,575	27,575	27,575	
R-squared	0.025	0.030	0.005	0.003	
N of households	20,278	20,278	20,278	20,278	
Mean	74.404	41.417	15.615	17.371	

Notes: Panel A shows a state-level OLS regression of gender equality and women's status on the GSD sports index (multiplied by 100). The dependent variable in column 1 is the proportion of individuals reporting gender-equal attitudes from the 1972-2018 General Social Survey. Columns 2-5 includes average state-level variables on the status of women from the Institute for Women's policy research. There is no availability of information on the Political Participation Index for the District of Columbia (Panel A, column 2). Panel B shows a state-level OLS regressions of labor and non-labor market outcomes for women relative to men on the GSD sports index: The labor force participation gender gap, the share of females never married, and the average female age at first child are constructed from the 2002-2018 American Community Survey (ACS), and the (log) wage gender gap is constructed from the 2002-2018 Current Population Survey (CPS) on the hourly wage. Labor market outcomes are estimated on a sample of natives aged 25-64 and non-labor market outcomes are estimated for a sample of native women aged 20 to 40. Panels C and D present siblings fixed effects model of parental time (minutes per day) from the 2003-2018 America Time Use survey. The sample includes native parents aged 21 to 55 with at least one child between 6 and 11 years in the household. Estimations are obtained using survey-specific weights and include controls for age of children. Robust standard errors are in parentheses.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

ONLINE APPENDIX

TABLE A1—DATA APPENDIX

Data	Unit of obs	Main variables description	Other variables	Sample Selection
2002/2003 to 2018/2019 academic years National Federation of State High School Associations (NFHS) https://members.nfhs.org/participation_statistics	State level	Variable: GSD sports index To construct the GSD sports index, we use data from the NFHS, which collects and publishes on-line information on the number of players in each sport by gender for each state over time. Sports listed by the NFHS are Adapted Basketball, Adapted Bocce (Indoor), Adapted Bowling, Adapted Floor Hockey, Adapted Football, Adapted Soccer, Adapted Softball, Adapted Track, Adapted Volleyball, Adaptive Corn Toss, Adaptive Golf, Adaptive Handball, Adaptive Strength Training, Adaptive Tennis, Air Riflery, Archery, Badminton, Baseball, Basketball, Bass Fishing, Beach Volleyball, Bocce (Outdoor), Bowling, Canoe Paddling, Canoeing, Competitive Spirit Squad (Boys who cheer/Girls who cheer), Crew, Cross Country, Cycling, Dance, High Kick, Jazz, Dance/Drill, Decathlon, Drill Team, Equestrian, Fencing, Field Hockey, Figure Skating, Flag Football, Football (11 player), Football (6 player), Football (8 player), Football (9 player), Golf, Gymnastics, Heptathlon, Ice Hockey, Judo, Kayaking, Lacrosse, Martial Arts, Mixed 6-Coed Volleyball, Mt. Biking, Native Youth Olympics, None, Outrigger Canoe Paddling LL, Pentathlon, Rugby, Riflery, Rock, Climbing, Rodeo, Roller Hockey, Rhythmic Gymnastics, Sand Volleyball, Skiing (Alpine), Skiing (Cross Country), Snowboarding, Soccer, Soft Tennis, Softball (Fast Pitch), Softball (Slow Pitch), Squash, Surfing, Swimming and Diving, Synchronized Swimming, Team Tennis, Tennis, Track and Field (Indoor), Track and Field (Outdoor), Trap Shooting, Ultimate Frisbee, Unified Basketball, Unified Flag Football, Unified Track and Field (Outdoor), Volleyball, Water Polo, Weight Lifting, Wrestling, Sailing, Other.		

1972-2018 General Social Survey (GGS) https://gss.norc.org/Get-The-Data	9 US regions: New England, Middle Atlantic, East north Central, West north Central, South Atlantic, East south Central, West. South Central, Mountain, and Pacific. (this is the only data publicly available)	Variable: Gender equal We construct the share of individuals that strongly agree with a gender-equal statement (or strongly disagree with a non-gender-equal statement). We use the following GSS Questions: (1) Do you approve of a married woman earning money in business or industry if she has a husband capable of supporting her? (Answer Approve: coded as gender-equal attitudes=1); (2) If your party nominated a woman for president, would you vote for her if she were qualified for the job? (Answer Yes: coded as gender-equal attitudes=1); (3) Do you agree or disagree with this statement? Women should take care of running their home and leave running the country up to men. (Answer disagree: coded as gender-equal attitudes=1) (4) Most men are better suited emotionally for politics than are most women. (Answer disagree: coded as gender-equal attitudes=1) (5) A working mother can establish just as warm and secure a relationship with her children as a mother who does not work. (Answer strongly agree: coded as gender-equal attitudes=1) (6) A preschool child is likely to suffer if his or her mother works (Answer strongly disagree: coded as gender-equal attitudes=1); (7) It is more important for a wife to help her husband's career than to have one herself (answer strongly disagree: coded as gender-equal attitudes=1); (8) It is much better for everyone involved if the man is the achiever outside the home and the women takes care of the home and family (answer strongly disagree: coded as gender-equal attitudes=1). Results do not change when we consider the dummy to take value 1 if a respondent strongly agrees/agrees with a gender-equal statement (or strongly disagrees/disagrees with a non-gender-equal statement) in those questions in which both alternatives are available.	We exclude respondents who do not answer and those coded as not applicable or do not know

Institute for Women's Policy Research (IWPR) Status of Women in the States Data, Institute for Women's Policy Research https://iwpr.org/tools-data/data-for-researchers/status-women-states-data/	State level	Variables: Political Participation, Social and Economic Autonomy, Reproductive Rights, and Health and Well-being We average across the years in which the information is available for each index as follows: social and economic autonomy (1989-2005), political participation (1992-2004), reproductive rights (1996-2004) and health and well-being (1991-2002). Indicators capture how far a state is from reaching equality. Equality in women's status in the political participation area is achieved in a state: when women's voter registration and voter turnout are set at the value of the highest state for these components; when 50 percent of elected positions are held by women; and when a state has both a commission for women and a women's legislative caucus in each house of the state legislature. In the case of the social and economic autonomy, equality is considered: when a state achieves the highest value for all states in the percentage of women with health insurance; when the percentage of women with higher education achieves that of men at the national level; when the percentage of businesses owned by women are set as if 50 percent of businesses were owned by women; and when the percentage of women in poverty are equal to that of men at the national level. For the reproductive rights index equality takes place when a state assumes to have: no notification/consent or waiting period policies; public funding for abortion, prochoice government, 100 percent of women living in counties with an abortion provider, insurance mandates for contraceptive coverage and infertility coverage, maximum legal guarantees of second-parent adoption, and mandatory sex education for students. The health and well-being index considers equality in a state when: mortality rates (from heart disease, lung cancer, breast cancer, and suicide), the incidence of some diseases (diabetes, chlamydia, and AIDS), and the mean days of poor mental health and mean days of activity limitations are equal to the national goal, and in the absence of goals to the level of the best state among all states. A detailed description of how these indicators are constructed can be found at https://iwpr.org/wp-content/uploads/wpallimport/files/iwpr-export/publications/appendices.pdf.	
2002-2018 American Community Survey (ACS) Ruggles, Steven, Sarah Flood, Ronald Goeken, Josiah Grover, Erin Meyer, Jose Pacas and Matthew Sobek. IPUMS USA: Version 9.0 [dataset]. Minneapolis, MN: IPUMS, 2019. https://doi.org/10.18128/D010.V9.0	Individual level	Variables: LFP Gap (Female - Male) (%), Share of Females Never married (%), and Average Female Age at First Birth The labor force participation gap is constructed as the difference between the percentage of females in labor force and the percentage of males in labor force in each state. The share of females never married is calculated as the percentage of females never married by state. The average age at first birth by state is obtained using information on how old a woman was when her first child was born from the reported age of her eldest child living in the same household.	LFP Gap (Female - Male) (%): Natives aged 25-64 Share of Females Never married (%), and Average Female Age at First Birth: Native women aged 20 to 40.

2002-2018 Current Population Survey (CPS) Flood, Sarah, Miriam King, Renae Rodgers, Steven Ruggles, and J. Robert Warren. Integrated Public Use Microdata Series, Current Population Survey: Version 7.0 [dataset]. Minneapolis, MN: IPUMS, 2019. https://doi.org/10.18128/D030.V7.0	Individual level	Variable: Log Wage Gaps, conditional on working (Female-Male) The wage gender gap is constructed as the difference between the average female wages and the average male wages (in logs and conditional on working).		Natives aged 25-64
2003-2018 American Time Use Survey Hofferth, Sandra L., Sarah Flood, and Matthew Sobek. American Time Use Survey Data Extract Builder: Version 2.7 [dataset]. College Park, MD: University of Maryland and Minneapolis, MN: IPUMS, 2018. https://doi.org/10.18128/D060.V2.7	Individual level	Variables: Time (minutes per day), Time Spent in Basic Care (minutes per day), Time Spent in Recreational Activities (minutes per day), and Time Spent in Educational Activities (minutes per day) We construct the time that boys and girls receive from parents as the sum of all minutes per day spent in parental activities with the child as primary activity. A particular advantage of the ATUS over other time diary surveys is that parents record the time they spend with every child living in the household, and the activity they engage with. Together with the information on the child's gender, we construct the time that boys and girls receive from parents as the sum of all minutes per day spent in parental activities with the child as primary activity. The information on the gender of the child is limited to children who are classified as household members. We cannot use information on child care of non-household members. Results are maintained when we use a sample of married individuals who are supposed to be less likely to have non-household children than those divorced or separated individuals. Categories of the time use survey are described as follows, where children refer to household children only. Basic child care: Physical care for hh children, Organization and planning for hh children, Looking after hh children (as a primary activity), Waiting for/with hh children, Picking up/dropping off hh children, Caring for and helping hh children, n.e.c, Activities Related to Household Children's Health, Providing medical care to hh children, Obtaining medical care for hh children, Waiting associated with hh children's health, Activities related to hh child's health, n.e.c.. Recreational child care is defined incorporating: Playing with hh children, not sports, Arts and crafts with hh children, Playing sports with hh children, and Attending hh children's events. Educational child care includes: Reading to/with hh children, Talking with/listening to hh children, Activities Related to Household Children's Education, Homework (hh children), Meetings and school conferences (hh children), Home schooling of hh children, Helping or teaching hh children, Waiting associated with hh children's education, and Activities related to hh child's education, n.e.c.	Age Age of children Education of parents (Dummies: high school, college or more college) Race of parents (Dummies: white and black).	Native parents aged 21 to 55 with at least one child between 6 and 11 years in the household

Notes: Data sources are ordered according to the order in which they appear in the text.

TABLE A2—GENDER STEREOTYPING IN SPORTS, GENDER NORMS, AND PARENTAL TIME INVESTMENTS (70 PER CENT THRESHOLD)

Panel A

	(1)	(2)	(3)	(4)	(5)
Dependent variable:	Gender-equal	Political Participation	Social and Economic Autonomy	Reproductive Rights	Health and Well-being
GSD sports index	0.005***	0.339**	0.050***	0.268***	0.029**
	(0.002)	(0.155)	(0.013)	(0.034)	(0.013)
Observations	51	50	51	51	51
R-squared	0.221	0.077	0.217	0.374	0.065
Mean	0.499	0.890	7.002	2.362	2.038

Panel B

	(1)	(2)	(3)	(4)
Dependent variable:	LFP Gap (Female - Male) (%)	Log Wage Gaps, conditional on working (Female-Male)	Share of Females Never married (%)	Average Female Age at First Birth
GSD sports index	0.197**	0.009	1.000***	0.096***
	(0.088)	(0.009)	(0.336)	(0.041)
Observations	51	51	51	51
R-squared	0.080	0.046	0.183	0.174
Mean	-9.335	-0.139	45.412	23.564

Panel C: Parental Time Investments - Fathers with children 6-11

	(1)	(2)	(3)	(4)
Dependent variable	Total Time (minutes per day)	Time Spent in Basic Care (minutes per day)	Time Spent in Recreational Activities (minutes per day)	Time Spent in Educational activities (minutes per day)
Female	-8.536***	-4.371***	-2.984***	-1.182***
	(1.450)	(1.223)	(0.648)	(0.397)
GSD x Female	1.003***	0.481***	0.395***	0.127
	(0.250)	(0.179)	(0.142)	(0.078)
Observations	18,716	18,716	18,716	18,716
R-squared	0.015	0.008	0.006	0.003
N of households	13,609	13,609	13,609	13,609
Mean	48.310	21.023	18.568	8.720

Panel D: Parental Time Investments - Mothers with children 6-11

	(1)	(2)	(3)	(4)
Dependent variable	Total Time (minutes per day)	Time Spent in Basic Care (minutes per day)	Time Spent in Recreational Activities (minutes per day)	Time Spent in Educational activities (minutes per day)
Female	3.150*	1.459	1.197**	0.494
	(1.785)	(1.169)	(0.535)	(0.976)
GSD x Female	0.013	-0.137	0.076	0.074
	(0.413)	(0.302)	(0.145)	(0.155)
Observations	27,575	27,575	27,575	27,575
R-squared	0.025	0.030	0.005	0.003
N of households	20,278	20,278	20,278	20,278
Mean	74.404	41.417	15.615	17.371

Notes: See Table 1.
*** Significant at the 1 percent level.
** Significant at the 5 percent level.
* Significant at the 10 percent level.

TABLE A3—GENDER STEREOTYPING IN SPORTS, GENDER NORMS, AND PARENTAL TIME INVESTMENTS (60 PER CENT THRESHOLD)

Panel A					
	(1)	(2)	(3)	(4)	(5)
Dependent variable:	Gender-equal	Political Participation	Social and Economic Autonomy	Reproductive Rights	Health and Well-being
GSD sports index	0.004***	0.270*	0.037***	0.179***	0.036**
	(0.001)	(0.142)	(0.011)	(0.031)	(0.009)
Observations	51	50	51	51	51
R-squared	0.168	0.060	0.144	0.203	0.118
Mean	0.499	0.890	7.002	2.362	2.038
Panel B					
	(1)	(2)	(3)	(4)	
Dependent variable:	LFP Gap (Female - Male) (%)	Log Wage Gaps, conditional on working (Female-Male)	Share of Females Never married (%)	Average Female Age at First Birth	
GSD sports index	0.153**	0.003	0.616**	0.058*	
	(0.070)	(0.007)	(0.237)	(0.030)	
Observations	51	51	51	51	
R-squared	0.059	0.007	0.085	0.079	
Mean	-9.335	-0.139	45.412	23.564	
Panel C: Parental Time Investments - Fathers with children 6-11					
	(1)	(2)	(3)	(4)	
Dependent variable	Total Time (minutes per day)	Time Spent in Basic Care (minutes per day)	Time Spent in Recreational Activities (minutes per day)	Time Spent in Educational activities (minutes per day)	
Female	-9.943***	-5.071***	-3.746***	-1.126**	
	(1.726)	(1.310)	(0.917)	(0.547)	
GSD x Female	0.778***	0.377***	0.342***	0.059	
	(0.219)	(0.143)	(0.128)	(0.080)	
Observations	18,716	18,716	18,716	18,716	
R-squared	0.014	0.008	0.006	0.003	
N of households	13,609	13,609	13,609	13,609	
Mean	48.310	21.023	18.568	8.720	
Panel D: Parental Time Investments - Mothers with children 6-11					
	(1)	(2)	(3)	(4)	
Dependent variable	Total Time (minutes per day)	Time Spent in Basic Care (minutes per day)	Time Spent in Recreational Activities (minutes per day)	Time Spent in Educational activities (minutes per day)	
Female	2.367	0.987	1.536*	-0.156	
	(2.592)	(1.724)	(0.812)	(1.313)	
GSD x Female	0.140	0.006	-0.016	0.150	
	(0.383)	(0.274)	(0.131)	(0.154)	
Observations	27,575	27,575	27,575	27,575	
R-squared	0.025	0.030	0.005	0.003	
N of households	20,278	20,278	20,278	20,278	
Mean	74.404	41.417	15.615	17.371	

Notes: See Table 1.
*** Significant at the 1 percent level.
** Significant at the 5 percent level.
* Significant at the 10 percent level.

TABLE A4—GSD SPORTS INDEX BY STATE

State	GSD	State	GSD	State	GSD	State	GSD
Alabama	0	Iowa	0.491	Washington	1.576	Pennsylvania	3.698
South Carolina	0	Idaho	0.674	Missouri	1.992	Minnesota	3.838
North Carolina	0.033	Wyoming	0.679	Maryland	2.143	Arizona	4.100
West Virginia	0.048	Michigan	0.814	Virginia	2.199	New Jersey	4.142
Indiana	0.068	Kentucky	0.932	North Dakota	2.401	Nevada	5.713
Louisiana	0.134	New Mexico	0.945	DC	2.558	Illinois	5.879
Mississippi	0.157	Arkansas	0.953	Wisconsin	2.660	Massachusetts	6.525
Utah	0.166	Texas	1.025	Florida	2.721	Alaska	6.778
Montana	0.234	Tennessee	1.081	New Hampshire	3.087	California	8.397
Kansas	0.369	Georgia	1.086	Connecticut	3.129	Rhode Island	9.351
South Dakota	0.391	Colorado	1.124	Ohio	3.196	Vermont	9.854
Oklahoma	0.412	Oregon	1.392	Maine	3.643	Hawaii	17.143
Nebraska	0.466	Delaware	1.526	New York	3.657		

Notes: The values of the GSD sports index are multiplied by 100 for ease of exposition.

TABLE A5—GENDER STEREOTYPING IN SPORTS, GENDER NORMS, AND PARENTAL TIME INVESTMENTS (WITHOUT HAWAII)

Panel A					
	(1)	(2)	(3)	(4)	(5)
Dependent variable:	Gender-equal	Political Participation	Social and Economic Autonomy	Reproductive Rights	Health and Well-being
GSD sports index	0.008***	0.485**	0.067***	0.294***	0.021
	(0.001)	(0.208)	(0.015)	(0.054)	(0.017)
Observations	50	49	50	50	50
R-squared	0.283	0.091	0.230	0.291	0.020
Mean	0.498	0.861	6.994	2.295	2.025

Panel B				
	(1)	(2)	(3)	(4)
Dependent variable:	LFP Gap (Female - Male) (%)	Log Wage Gaps, conditional on working (Female-Male)	Share of Females Never married (%)	Average Female Age at First Birth
GSD sports index	0.299***	0.023***	1.500***	0.161***
	(0.104)	(0.005)	(0.329)	(0.039)
Observations	50	50	50	50
R-squared	0.105	0.174	0.238	0.280
Mean	-9.352	-0.136	45.331	23.563

Panel C: Parental Time Investments - Fathers with children 6-11				
	(1)	(2)	(3)	(4)
Dependent variable	Total Time (minutes per day)	Time Spent in Basic Care (minutes per day)	Time Spent in Recreational Activities (minutes per day)	Time Spent in Educational activities (minutes per day)
Female	-8.749***	-4.483***	-3.091***	-1.174***
	(1.494)	(1.257)	(0.675)	(0.414)
GSD x Female	1.136***	0.548***	0.455***	0.132
	(0.291)	(0.211)	(0.165)	(0.092)
Observations	18,670	18,670	18,670	18,670
R-squared	0.015	0.008	0.006	0.003
N of households	13,574	13,574	13,574	13,574
Mean	48.317	21.022	18.599	8.695

Panel D: Parental Time Investments - Mothers with children 6-11				
	(1)	(2)	(3)	(4)
Dependent variable	Total Time (minutes per day)	Time Spent in Basic Care (minutes per day)	Time Spent in Recreational Activities (minutes per day)	Time Spent in Educational activities (minutes per day)
Female	3.089	1.561	1.127**	0.401
	(1.905)	(1.248)	(0.563)	(1.036)
GSD x Female	0.021	-0.192	0.108	0.104
	(0.498)	(0.352)	(0.175)	(0.197)
Observations	27,492	27,492	27,492	27,492
R-squared	0.025	0.030	0.005	0.003
N of households	20,216	20,216	20,216	20,216
Mean	74.375	41.415	15.584	17.376

Notes: See Table 1.
*** Significant at the 1 percent level.
** Significant at the 5 percent level.
* Significant at the 10 percent level.

TABLE A6—PARENTAL TIME INVESTMENTS (OLS REGRESSIONS)

Panel C: Parental Time Investments - Fathers with children 6-11				
	(1)	(2)	(3)	(4)
Dependent variable	Total Time (minutes per day)	Time Spent in Basic Care (minutes per day)	Time Spent in Recreational Activities (minutes per day)	Time Spent in Educational activities (minutes per day)
Female	-8.440***	-1.960*	-4.908***	-1.572**
	(1.742)	(1.030)	(1.092)	(0.687)
GSD x Female	1.016**	0.205	0.533**	0.277
	(0.460)	(0.287)	(0.262)	(0.195)
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	18,716	18,716	18,716	18,716
R-squared	0.030	0.025	0.016	0.018
Mean	48.310	21.023	18.568	8.720
Panel D: Parental Time Investments - Mothers with children 6-11				
	(1)	(2)	(3)	(4)
Dependent variable	Total Time (minutes per day)	Time Spent in Basic Care (minutes per day)	Time Spent in Recreational Activities (minutes per day)	Time Spent in Educational activities (minutes per day)
Female	3.394*	3.225**	-0.778	0.947
	(1.938)	(1.298)	(0.877)	(1.005)
GSD x Female	-0.322	-0.135	0.070	-0.258
	(0.511)	(0.350)	(0.234)	(0.247)
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	27,575	27,575	27,575	27,575
R-squared	0.042	0.044	0.018	0.014
Mean	74.404	41.417	15.615	17.371

Notes: Panels C and D present OLS regression model of parental time (minutes per day) from the 2003-2018 America Time Use survey on GSD sports index (multiplied by 100). The sample includes native parents aged 21 to 55 with at least one child between 6 and 11 years in the household. Estimations are obtained using survey-specific weights and include controls for age, age of children, education of parents, race of parents, state and year fixed effects. Race is included as a set of two dummies (white, black, other(omitted)). Education is included as a set of three dummies indicating whether the father/mother has completed high school, 3 years of college, or 4 or more years of college. Robust standard errors are in parentheses.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.