Marrying up: trading off spousal income and height

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Matching on "stature”

- Couple’s heights tend to match (Weitzman and Conley 2014).
- For the sake of height alone or traits associated with “stature”:
  - cognitive ability
    - (Case and Paxson 2008),
  - non-cognitive ability, e.g., self-confidence
    - (Persico, Postlewaite, and Silverman 2004),
  - health
    - (Lundborg, Nystedt, and Rooth 2009),
  - education, occupation, and industry
    - (Case, Paxson, and Islam 2009; Herpin 2005),

Matching on “stature”

- income/socioeconomic status
  - (Cavelaars et al. 2000; Case and Paxson 2008; Gao and Smyth 2010; Hatton and Bray 2010; Harper 2000; Heineck 2005; Peck and Lundberg 1995; Persico, Postlewaite, and Silverman 2004; Singh-Manoux et al. 2010; Walker, Shaper, and Wannamethee 1988),
- and even happiness
  - (Deaton and Arora 2009)?

- Importantly, unlike these other traits,
  - height is readily observable and
  - may be crucial for initial sorting among potential couples.

Matching on stature, inequality, and social mobility

- Matching on height alone may increase
  - within-generation inequality in associated traits across families
    - (Schwartz 2013; Schwartz and Mare 2005)
  - that continue across generations
  - since height is highly heritable
    - (McEvoy and Visscher 2009; Stulp and Barrett 2016),
- Matching on height may perpetuate the continued association between height and social class.
- However, despite the potential importance of matching on height and associated socioeconomic status,
  - there is little work in economics on how people search and match on height and socioeconomic status (Belot & Fidrmuc, 2010).

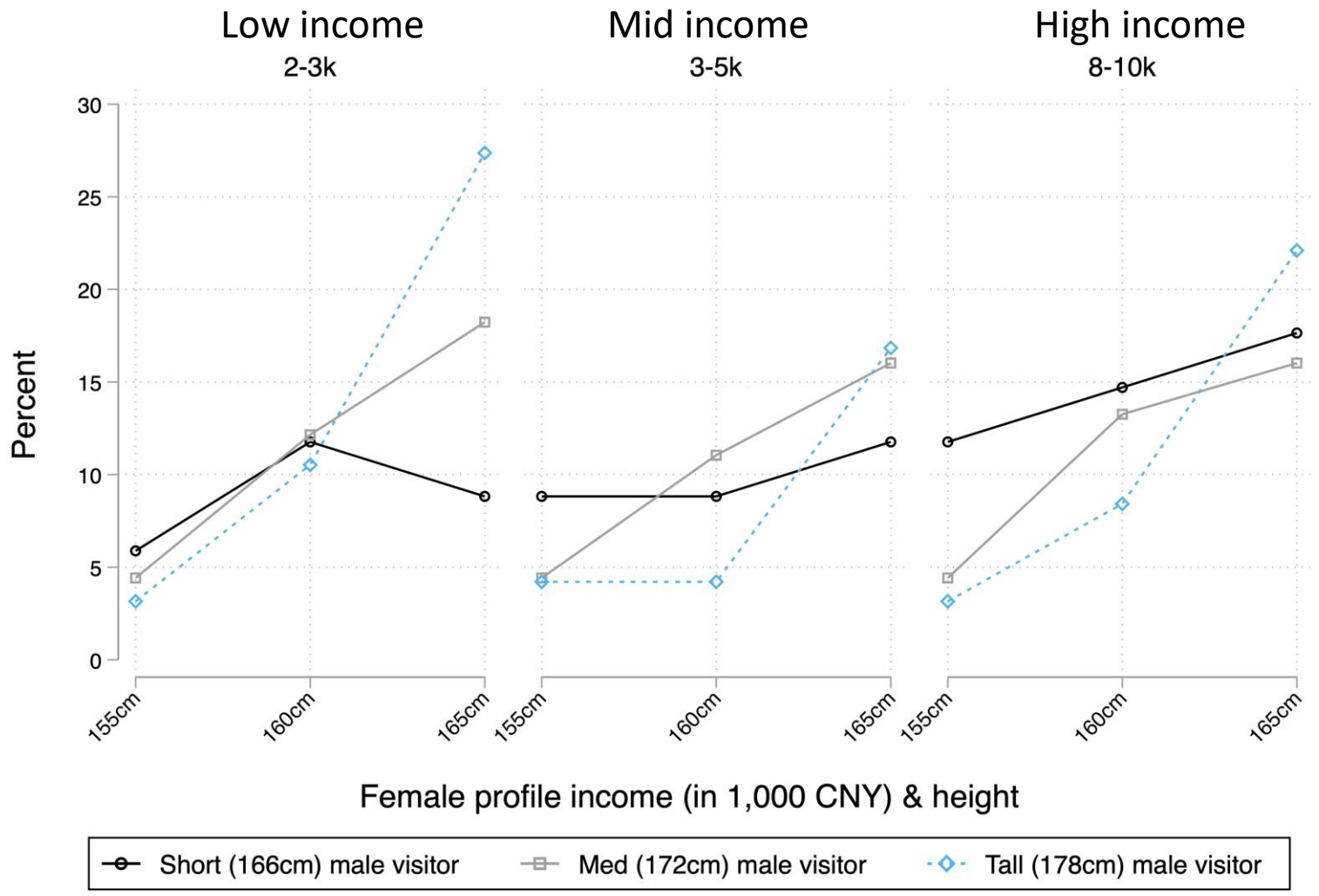
Search and matching on height and income

- Our research questions:
  - How do people search and match on height and income?
  - How do they tradeoff between the two?
- We explore these questions with
  - field experiment data from large (100+ mil members) online dating website in China (where reported income and height are observable),
  - household survey data of married couples
  - within multidimensional directed search framework.
- Nascent literature on multidimensional non-directed search and matching
  - (Eeckhout, 2018; Lindenlaub & Postel-Vinay, 2020; Chiappori et al., 2021).
- None on multidimensional directed search (Wright et al. 2021).

Online dating field experiment

- Randomly assigned heights and incomes to 360 unique artificial profiles in 2013. Closed after 24 hrs.
- Heights were one standard deviation below (short), at (medium), or above (tall) the average heights of each gender:
  - 160 cm for women and
  - 172 cm for men in the cities of the experiment.
- Also randomly assigned “low”, “middle”, and “high” incomes.
- We counted “visits”—clicks to abbreviated profiles from search engine results,
  - which display height and income information.

Men's visits to female profiles

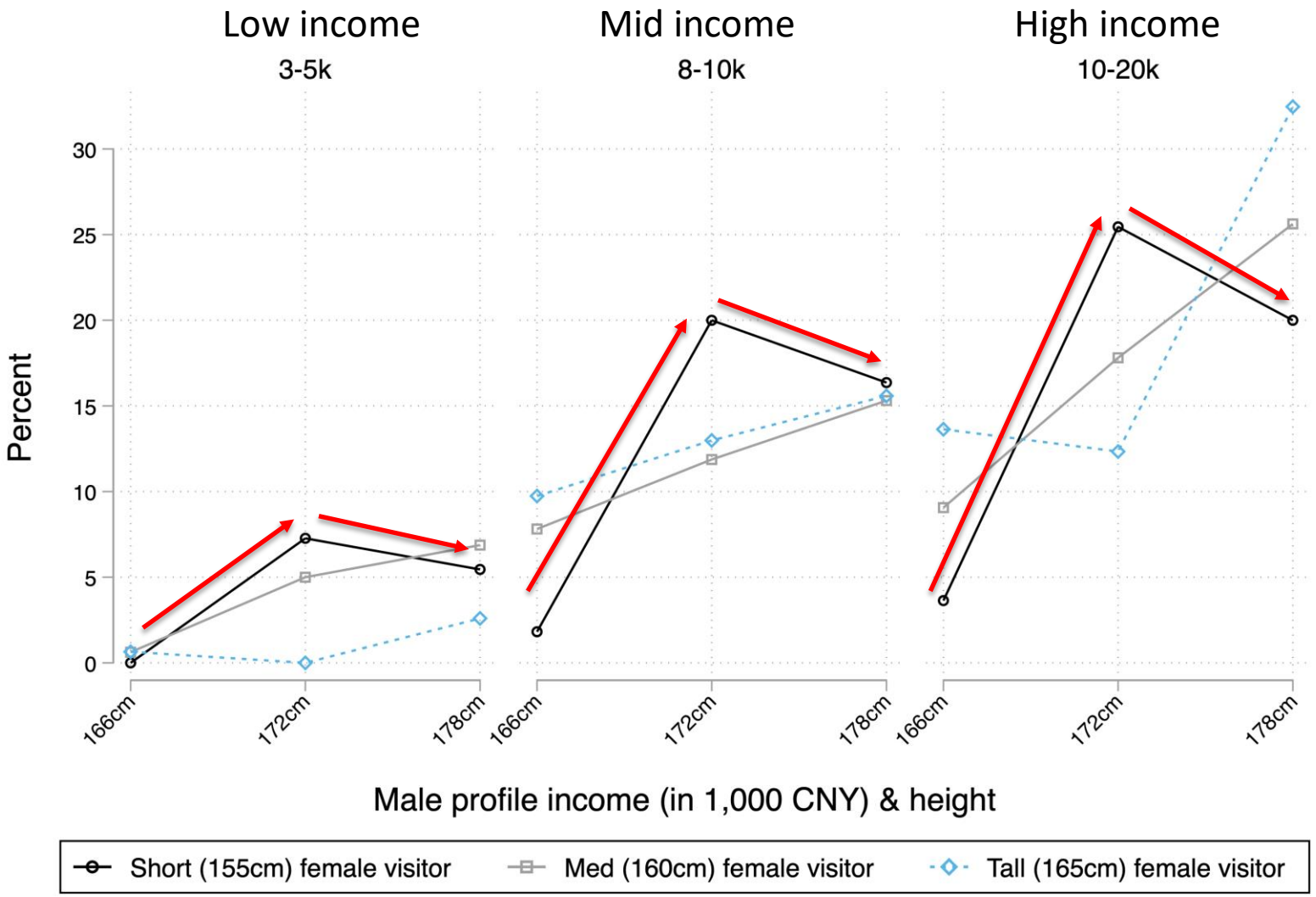


Except for short men, men are indifferent to female profile's income, but do visit taller women more.

Men are largely indifferent to the incomes of female profiles but prefer taller female profiles

Female profile	Visit percent	
	(1)	(2)
Profile income	0.046*	-0.000
Profile height	0.020	0.062***
Profile income*short man dummy		0.046
Profile height*short man dummy		-0.042*
Profile income*medium man dummy	-0.046	
Profile height*medium man dummy	0.042*	
Profile income*tall man dummy	-0.053	-0.007
Profile height*tall man dummy	0.073***	0.031
City dummies	Y	Y
Observations	540	540
R-squared	0.086	0.086

Women's visits to male profiles



Peak at 172 cm for short women can either be from satiation or competition from tall women.

Women's visits increase on male profile's height and income

Male profile	Visit percent	
	(1)	(2)
Profile income	0.054***	0.060***
Profile height	4.684***	0.366
Profile height^2	-0.013***	-0.001
Profile income*short woman dummy		-0.006
Profile height*short woman dummy		4.318***
Profile height^2*short woman dummy		-0.013***
Profile income*medium woman dummy	0.006	
Profile height*medium woman dummy	-4.318***	
Profile height^2*medium woman dummy	0.013***	
Profile income*tall woman dummy	0.028*	0.023
Profile height*tall woman dummy	-6.560***	-2.242
Profile height^2*tall woman dummy	0.019***	0.007
City dummies	Y	Y
Observations	540	540
R-squared	0.276	0.276

Inferring preferences from relative search rates (RSR)

- Tall men's and women's search patterns do not reveal their preference for height.
  - Either could be maximizing probability of reciprocity because they know of the other's sexes' preference for taller mate.
- Short women's generally higher visit rate to taller men
  - in spite of men's higher search intensity for taller women,
  - suggests that short women may have highest WTP for mate height.

Women's relative RSR for taller or richer men

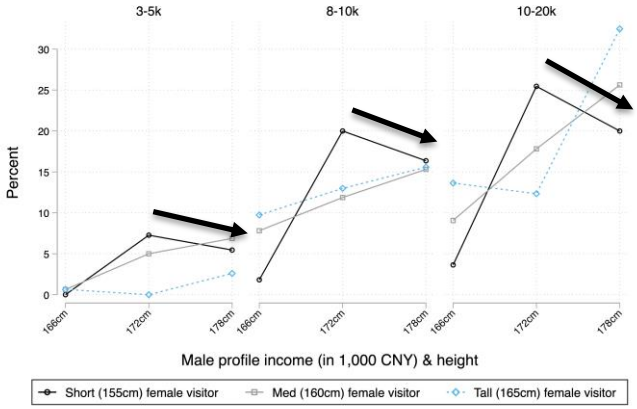
RSR at 166cm men	(1)	(2)
Short woman	0.457***	
Medium woman	0.107	
Tall woman	-0.043	
Chi2 test of differences of RSRs		
short = medium	chi2(1)= 5.17	p= 0.023**
short = tall	chi2(1)= 12.32	p= 0.000***
medium = tall	chi2(1)= 2.21	p= 0.137
RSR at 172cm men		
Short woman	0.109***	
Medium woman	0.084***	
Tall woman	0.053***	
Chi2 test of differences of RSRs		
short = medium	chi2(1)= 0.32	p= 0.570
short = tall	chi2(1)= 2.20	p= 0.138
medium = tall	chi2(1)= 0.90	p= 0.342
RSR at 178cm men		
Short woman	-0.239**	
Medium woman	0.062	
Tall woman	0.149**	
Chi2 test of differences of RSRs		
short = medium	chi2(1)=5.49	p=0.019**
short = tall	chi2(1)= 10.98	p= 0.000***
medium = tall	chi2(1)= 0.74	p= 0.389

RSR and WTP for height

- Is peak of short women's visit rate at 172 cm evidence of satiation point?
- Stulp et al.'s (2013) survey of a large sample of speed daters in US finds
  - 155 cm women most prefer 180 cm men.
- Importantly, within framework of multidimensional directed search,
  - relative search rates $\left(RSR = \frac{\left(\frac{\%\Delta \text{visits}}{\%\,\Delta \text{height}}\right)}{\left(\frac{\%\Delta\ \text{visits}}{\%\,\Delta\ \text{income}}\right)} \right)$ does not reveal WTP for height.
- RSR incorporates effect of competition.

How competition from tall women can cause short women's RSR to switch from positive to negative even with linear preference for height

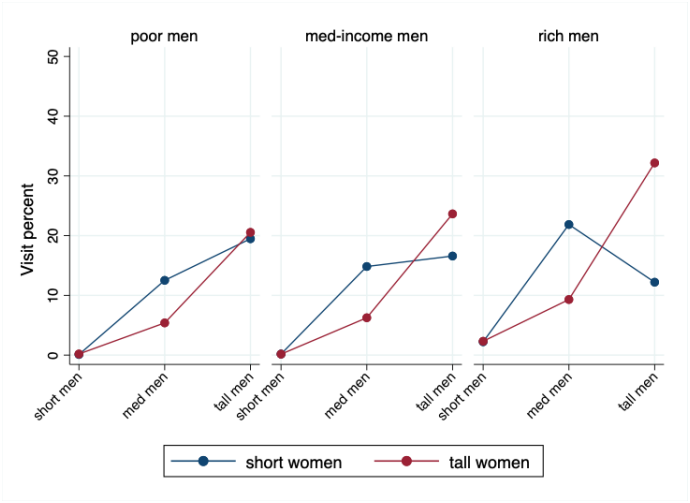
Experimental data



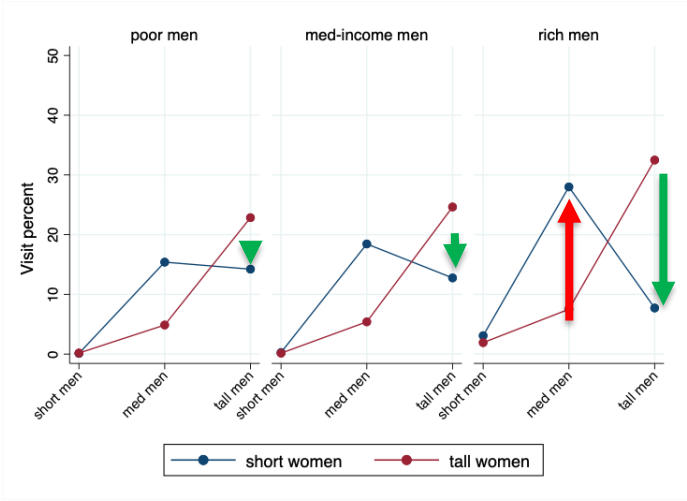
Increasing negative slope is consistent with crowding out of short women from searching for taller to richer men by taller women

Simulation data

Positive RSR for short women



Negative RSR for short women



Deriving WTP from household survey data of married couples

- China Family Panel Studies (CFPS) is a comprehensive survey of individual-, family-, and community-level data across China.
  - Chinese counterpart of the Panel Study of Income Dynamics (PSID) in the US.
- Includes 16,000 households in 25 provinces and is representative for the whole population of China.
- We restrict the sample to the 2191 married couples living in urban areas with hukou, both aged 20-45, and husband with positive income.
- We drop the observations whose height and weight are beyond three standard deviations from the mean,
  - which are either outliers or possibly recording mistakes during the survey,
  - leaving us a final sample of 2147 couples for analysis.

SUR Regressions of CFPS data: Short wives have highest WTP for husband height

	Short wife (<1 s.d.)		**Med wife**		**Tall wife (>1 s.d.)**	
	Wife's education	Wife's beauty	Wife's education	Wife's beauty	Wife's education	Wife's beauty
	(1)	(2)	(3)	(4)	(5)	(6)
Husband's log income	0.976***	0.176**	1.489***	0.209***	1.227***	0.219*
Husband's height	0.163***	0.032**	0.089***	0.009**	0.115***	0.000
Husband's and wife's age and province fixed effects	Y		Y		Y	
Observations	393		1,323		409	
Corr(residuals)	0.180***		0.203***		0.133***	
Breusch-Pagan test	chi2(1) = 12.680, Pr = 0.000		chi2(1) = 54.578, Pr = 0.000		chi2(1) = 7.281, Pr = 0.007	
Wald tests:						
Within columns:						
Husband's height / Husband's log income	0.167**	0.185*	0.060***	0.041*	0.094***	0.002
	(0.066)	(0.112)	(0.013)	(0.022)	(0.034)	(0.570)
	chi2(1) = 0.05, Pr = 0.823		chi2(1) = 0.69, Pr = 0.408		chi2(1) = 1.63, Pr = 0.202	
Log likelihood	-1655.375		-5448.073		-1685.064	
LR test:						
H0: WTP constant across wife groups	short = med		med = tall		short = tall	
	chi2(2) = 9.124**, Pr =0.010		chi2(2) =7.071**, Pr =0.029		chi2(2) = 9.836***, Pr = 0.007	

WTP for height from CFPS data

- For short wives, 1 cm increase in husband height is equivalent to 17-19 percent increase in his income,
  - more than three times that of the medium wife and twice that of tall wives.
- Short wive's stronger demand for height could be driven by desire for taller children,
  - given widespread height discrimination in China (Kuhn and Shen 2013).
- One way to test for this is to look at WTP for height among women who have children earlier when men are more plentiful.
- Confirming this conjecture, short early mothers' (give birth age$\leq$24) WTP for height increases most
  - among all heights of women
  - with the availability of men as measured by the local sex ratio.

Crowding out of short women in marriage market

- Given that short women have the highest intensity preference for mate height,
  - prior work suggests that they could lose out further in the competition for taller men,
  - when, paradoxically, these men become more plentiful (Ong et al., JDE 2020),
  - because the increase in the numbers of taller men
  - may disproportionately increase the “entry” of taller women into market for taller men.
- In other words, taller women may switch from prioritizing marrying richer men to marrying taller men
  - when there are more men, which crowds out shorter women.

Restriction in the age range in CFPS data

- We narrow the age range to those aged 20-30 to cover the range when women transition from singlehood to married life in China.
- The median age of first marriage for women in 2005 was 23. 98.5 percent were married by the age of 30.
- The 2010 Census does not contain micro-level data.
- However, CFPS data for 2010 shows a similar pattern as the 2005 Census.

Logit regressions of woman's marriage probability

(Medium woman as benchmark)	married=1; single=0	
	±1 s.d.	±2 s.d.
	(1)	(2)
Short woman	-0.092	-0.727
Tall woman	-0.412***	-1.191
Sex ratio	4.464**	4.257**
	(1.763)	(1.729)
Sex ratio*short woman	-6.421**	-8.057*
	(2.851)	(4.868)
Sex ratio*tall woman	0.761	-1.289
	(1.467)	(8.104)
Log income	-0.083***	-0.084***
Age, edu, and province dummies	Y	Y
Constant	1.598	1.563
Observations	1,677	1,677
Pseudo R2	0.388	0.389

Crowding out of short women in marriage market

- Only short women's probability of marriage
  - decreases on local sex ratios, both relative to medium women and absolutely.
- A 10 percent increase in the sex ratio
  - decreases the marriage probability of short women by 2 percentage points in absolute terms and
  - 6 percentage points compared with medium women,
  - who are more likely to marry when sex ratio increases.

Summary of results

- We show that both men and women
  - search more for taller members of the opposite sex.
- Surprisingly, women's height preference is inversely related to their own height,
  - with short women having the highest intensity preference for mate height, and that
  - possibly for the sake of acquiring the advantages of height and non-income associated factors for their children.
- We show evidence that short women are crowded out of
  - searching for taller men and into searching for richer men by taller women
  - marriage market by taller women when, ironically, there are more men available to marry.