In And Out Of Unemployment - Labour Market Dynamics And The Role Of Testosterone

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Introduction
The paper in a nutshell

- ▶ 'Joblessness leaves permanent scars on individuals' (Arulampalam, 2001, p. 585)
    - ▶ *Observable factors* (individual or household characteristics, past unemployment experience,...)
    - ▶ *personality traits and non-cognitive skills* (locus of control, the Big 5 personality traits,...)
- ▶ Hormones:
    - ▶ Testosterone (T) among men linked to risk-attitude and aggression, motivation, pro-social behaviour
    - ▶ Predictor for men's labour market performance
- ▶ In this paper: **Testosterone** $\iff$ **Entering/Exiting unemployment**

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Findings:

▶ *Unemployed men*: risk of remaining unemployed significantly declines in T

▶ *Employed men*: risk of becoming unemployed significantly higher for men with high T

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Literature review
Existing literature

T plays a role across various dimensions

- ▶ Health issues (e.g., cardiovascular disease)
- ▶ Demographic outcomes (e.g., fertility, divorce and mating)
- ▶ Labour market outcome
  - ▶ Higher earnings after prolonged prenatal T exposure
  - ▶ Education to be lower among people with low T levels
  - ▶ Choice of occupation:
    low T individuals → people-oriented jobs
    high T individuals → things-oriented jobs

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T and non-cognitive skills / individual characteristics:

▶ Association with risk-taking, dominant behaviour and aggression

▶ But also status-enhancing pro-social behaviour

▶ More willing to engage in competitive tasks and they showed more persistence solving an impossible task

▶ Positive association with numeric capabilities

▶ Perform better in face-to-face situations

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T and employment dynamics:

- ▶ Higher T levels associated with pro-social behaviour → larger social networks
- ▶ Job search (assessment centres/job interviews) might favour competitive, dominant and pro-social individuals
- ▶ In employment, employers learn about their employees' productivity → competition-seeking and dominant behaviour may become less critical
- ▶ Men with low T tend to be more risk-averse → prefer jobs that offer more stability

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Data
Health and biomarkers Survey

▶ Spine: *Understanding Society* data (UK based)
  ▶ Started in 2009 with 10 waves available
  ▶ 40 000 households at Wave 1
▶ 5 months after their Wave 2 or Wave 3 (2010-2013) → 20 000 adults received health assessment visit from a registered nurse (*Health and biomarkers survey*)
▶ Blood samples were taken to extract a range of biomarker data, including measures of growth hormones (T, DHEA's, IGF-1,...).

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Data
Adjusting T-level

T-levels change by age and time of day

▶ Men between 20-64 with the interview starting between 8 am and 8 pm (N=3 777)

▶ Form five age groups (20-29, 30-39, 40-49, 50-59, 60-64)
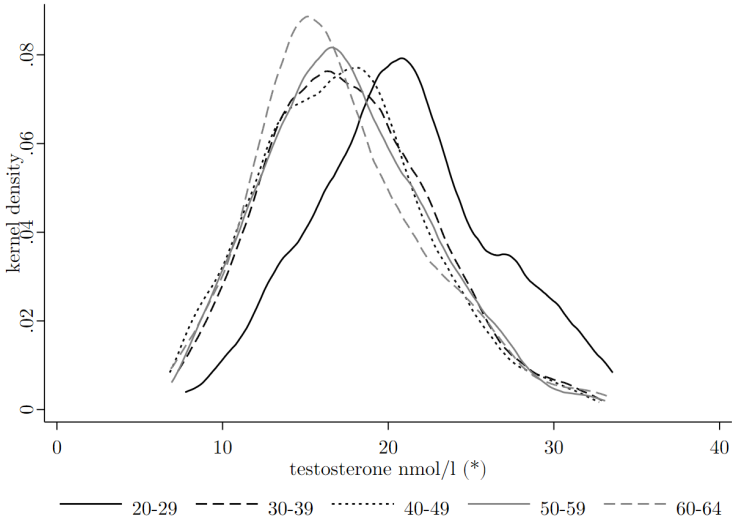
▶ For each age-group: Standardize them to 10 am

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Figure: Level of testosterone (nmol/l)

Data
Longitudinal data

Dataset preparation:

1. *Health and biomarker Survey* → men aged between 20 and 64 who are unemployed, or employed

2. Linking with first *post*-nurse visit wave of *Understanding Society* (employed and unemployed)

3. Final sample: unemployed (N=147), employed (N=2 224)

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Methodology

Reduced-form model:

$$y_{it} = 1\left(\alpha_1 y_{i(t=0)} + X'_{i(t=0)}\beta + u_i > 0\right) \quad (1)$$

▶ where $i = 1, \ldots, N$ are individuals, and $y_i = 1$ if i was unemployed at the first interview *post*-nurse visit and 0 otherwise.

▶ covariates: age, highest qualification, self-rated health, region, urban identifier, household size, long-term disability and legal marital status.

Methodology

Including T as a covariate:

- ▶ *Model 1:* linear version of corrected T level
- ▶ *Model 2:* quadratic version of corrected T level
- ▶ *Model 3:* Deviation of corrected T level: lowest quartile, second to third quartile, highest quartile

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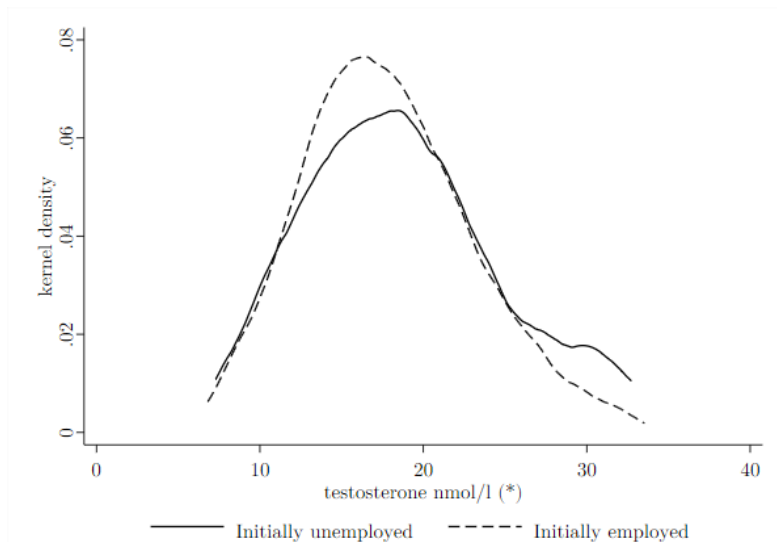
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Figure: Level of testosterone (nmol/l) by labour market status at the nurse visit

Results

Base regression

Model	Full Sample (1)	(2)	(3)
T (nmol/l)	0.0034	-0.0170	
	(0.0095)	(0.0515)	
T (nmol/l)^2		0.0005	
		(0.0013)	
T			
1st quartile		reference category	
2nd − 3rd quartile			-0.1569
			(0.1216)
4th quartile			0.0024
			(0.1347)
Observations	2 371	2 371	2 371
LogLikelihood	-372.983	-372.903	-371.772

Results

Base regression

Model	Initially unemployed		
	(1)	(2)	(3)
T (nmol/l)	-0.0217	-0.1784	
	(0.0207)	(0.1240)	
T (nmol/l)^2		0.0038	
		(0.0030)	
T			
1st quartile		reference category	
2nd − 3rd quartile			-0.8027***
			(0.3024)
4th quartile			-0.6206*
			(0.3346)
Observations	147	147	147
LogLikelihood	-84.743	-83.902	-81.538

Results

Base regression

Model	Initially employed (1)	(2)	(3)
T (nmol/l)	0.0091	-0.0007	
	(0.0110)	(0.0604)	
T (nmol/l)^2		0.0003	
		(0.0015)	
T			
1st quartile	reference category		
2nd – 3rd quartile			-0.0247
			(0.1408)
4th quartile			0.1191
			(0.1561)
Observations	2 224	2 224	2 224
LogLikelihood	-278.847	-278.833	-278.576

Results
Base regression

Table: APE of becoming unemployed

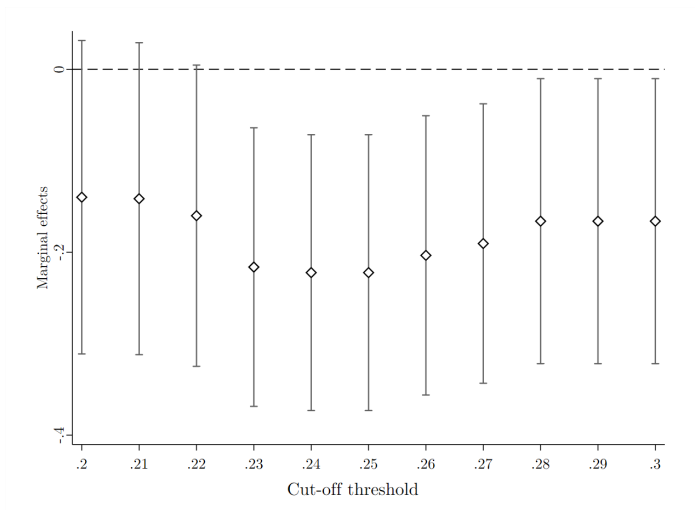| | Labour market position during the nurse visit | |
	unemployed	employed
1st quartile	reference category	
2nd – 3rd quartile	-0.2462***	-0.0015
	(0.0858)	(0.0085)
4th quartile	-0.1856*	0.0082
	(0.0957)	(0.0107)
Individuals	147	2 224

Robustness checks

Figure: Robustness on different age-windows (initially unemployed)
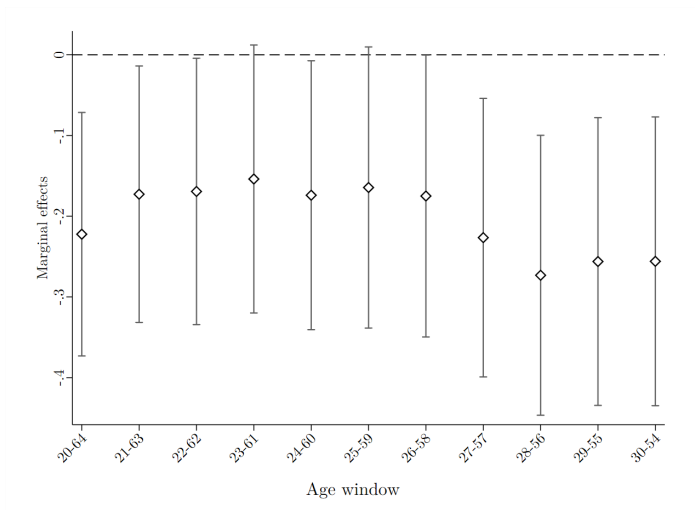
Robustness checks

Figure: Robustness on different cut-off thresholds (initially unemployed)

Robustness checks

Table: APE of becoming unemployed at wave 1 or 2

| | Labour market position during the nurse visit | |
	unemployed	employed
1st quartile	reference category	
2nd – 3rd quartile	-0.1681*	0.0088
	(0.0929)	(0.0940)
4th quartile	-0.1561	0.0264**
	(0.1002)	(0.0125)
Individuals	120	1 988

Conclusion

Heterogeneous effect of testosterone on labour market transitions:

- ▶ Initially unemployed: those with medium and high T levels are significantly more likely to exit unemployment
- ▶ Initially employed: higher T levels are more likely to experience unemployment
- ▶ Open task: Mendelian Randomization

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