



What They Say and What They Do: Comparing Physical Activity Across US, UK, and The Netherlands

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Motivation



- Physical activity is a major input in achieving a healthy life
- Increasingly comparative studies across nations try to assess which policies are most effective in improving the health and well-being of populations
- Largely these studies rely on self-reports of health behavior.
- How comparable are these self-reports?

Our study compares three countries



- Netherlands (NL)
- United States (US)
- United Kingdom (UK)
- Today's talk is only about NL and US
- We use two probability-based Internet panels:
- Longitudinal Internet Studies for the Social Sciences (LISS, NL)
- Understanding America Study (UAS, US)

What are accelerometers and how do we use them?



- Developed by Geneactiv (UK)
- Measures acceleration, skin temperature, daylight
- **Design of study in NL:**
 - 13 weeks data collection (among members of LISS panel)
 - 70 - 90 panel members per week
 - Panel member wears device for 8 days
 - ***About 900 LISS respondents***
- **Design of study in England:**
 - ***About 250 respondents of ELSA panel (age 50+)***
- **US: Currently about 300 respondents**
 - ***Aiming for 500 respondents in our new Internet panel: Understanding America Study (UAS)***

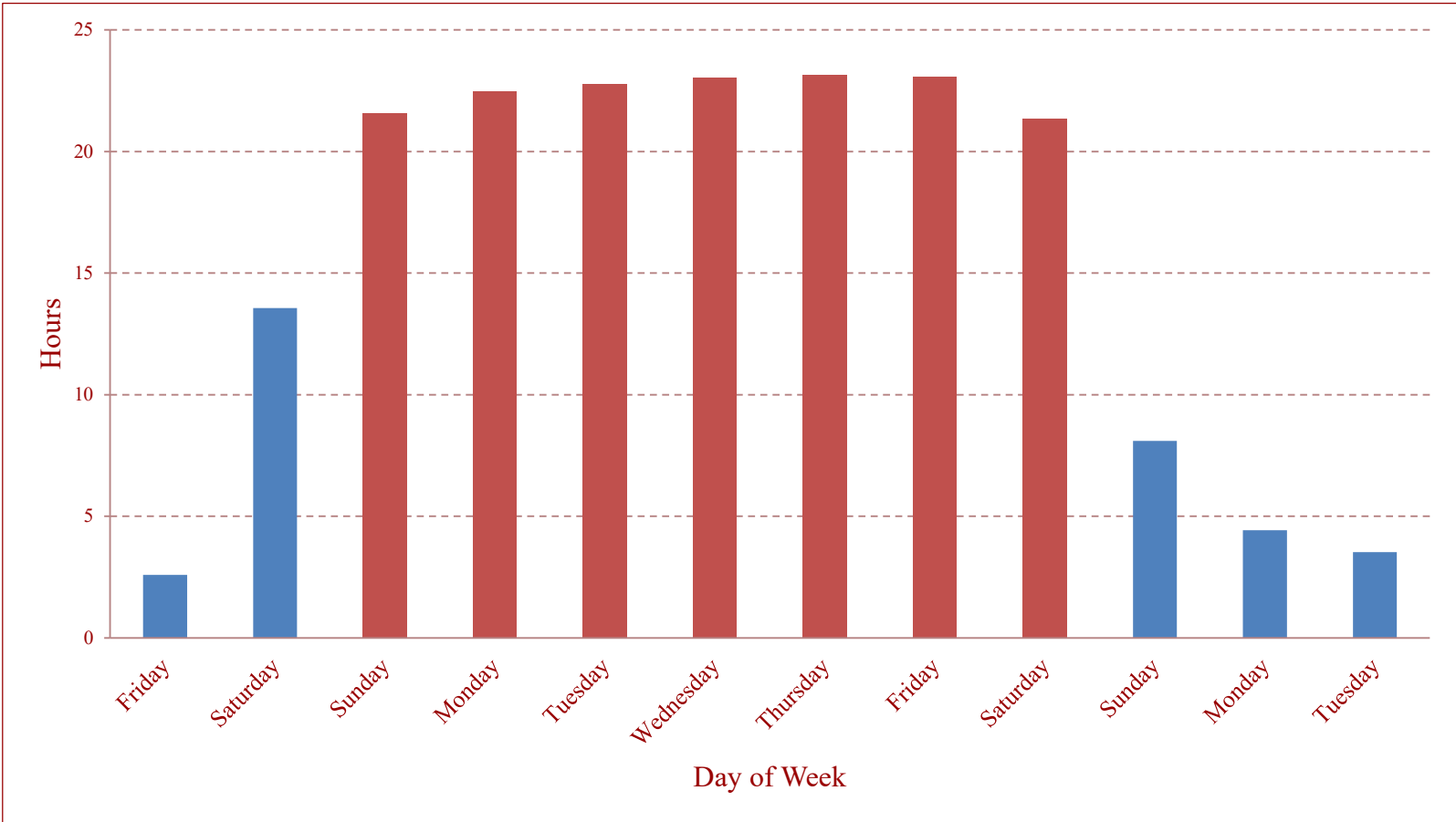


We do more

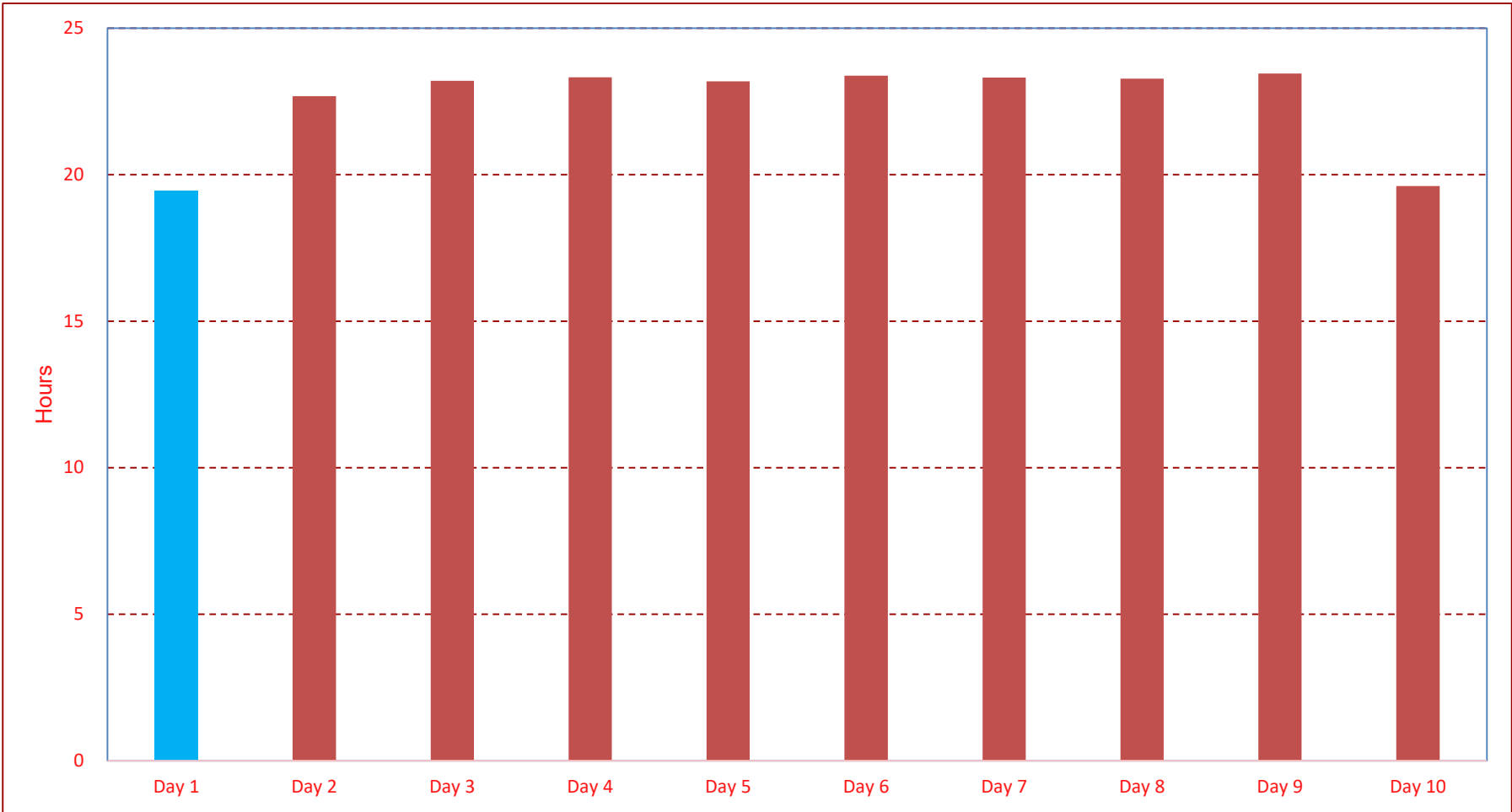


- For one weekday and one weekend day we ask about self reported physical activities, as well as global questions about physical activities

Average Total Hours the Devices Were Worn by Dutch Respondents by Day



Average Total Hours the Devices Were Worn by American Respondents by Day



Composition of Dutch and US samples



	LISS	Population	UAS	Population
Married	54%	40%	57%	48%
Female	51%	50%	55%	51%
Low	32%	33%	23%	42%
Medium	35%	41%	33%	31%
High	33%	25%	43%	27%
Working	50%	51%	64%	60%
Age(18-39)	21%	34%	29%	36%
Age(40-50)	20%	20%	19%	18%
Age(51-64)	31%	24%	32%	26%
Age(65+)	28%	22%	17%	19%
White	-		81%	74%
Dutch	86%		-	

How active do respondents say they are?

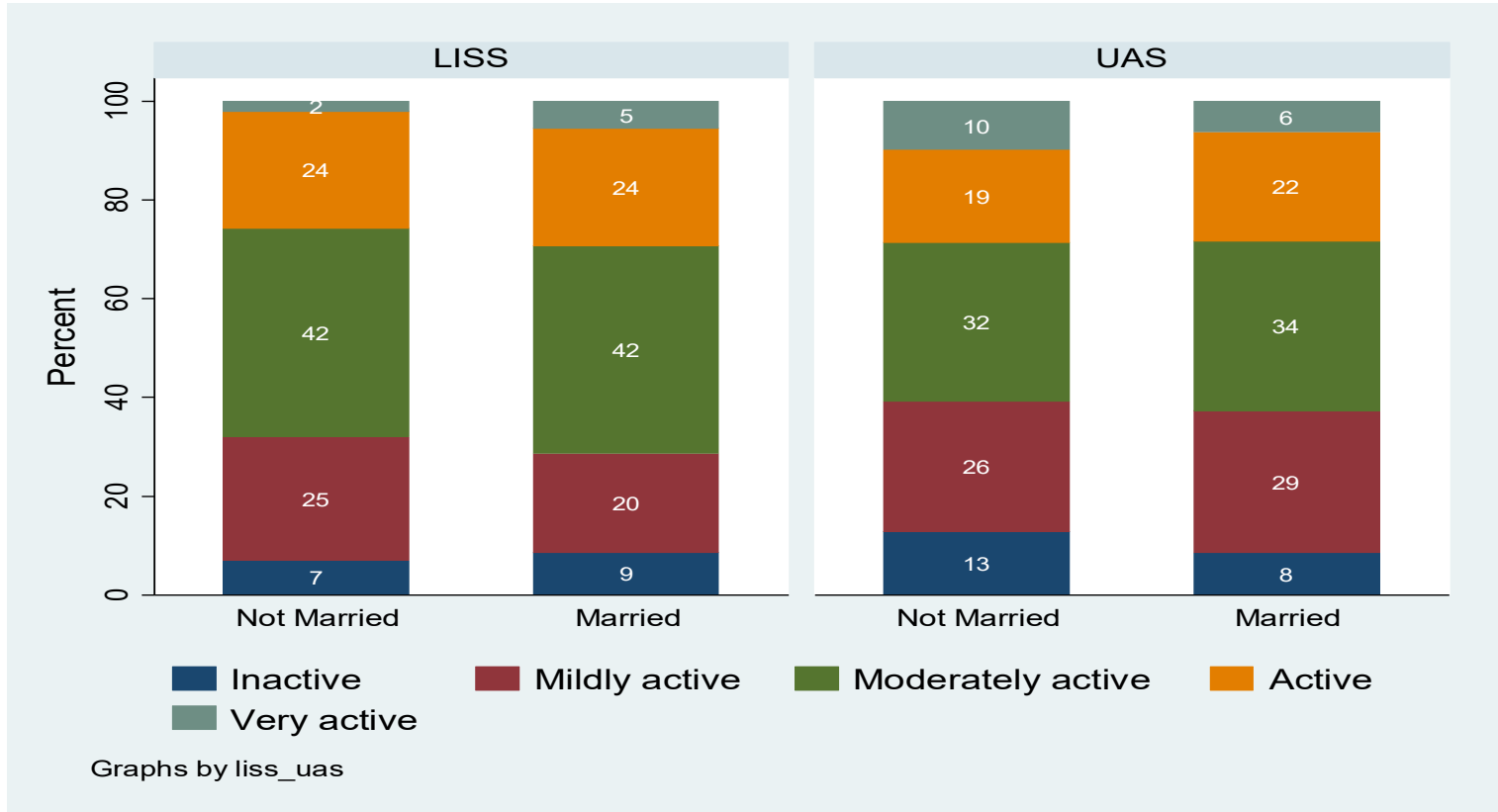


- How in general would you describe the level of your physical activities?

	LISS	UAS
Inactive	8%	10%
Mildly active	22%	27%
Moderately active	42%	33%
Active	24%	20%
Very Active	4%	8%
Chi-sq (P-value)	16.2	0

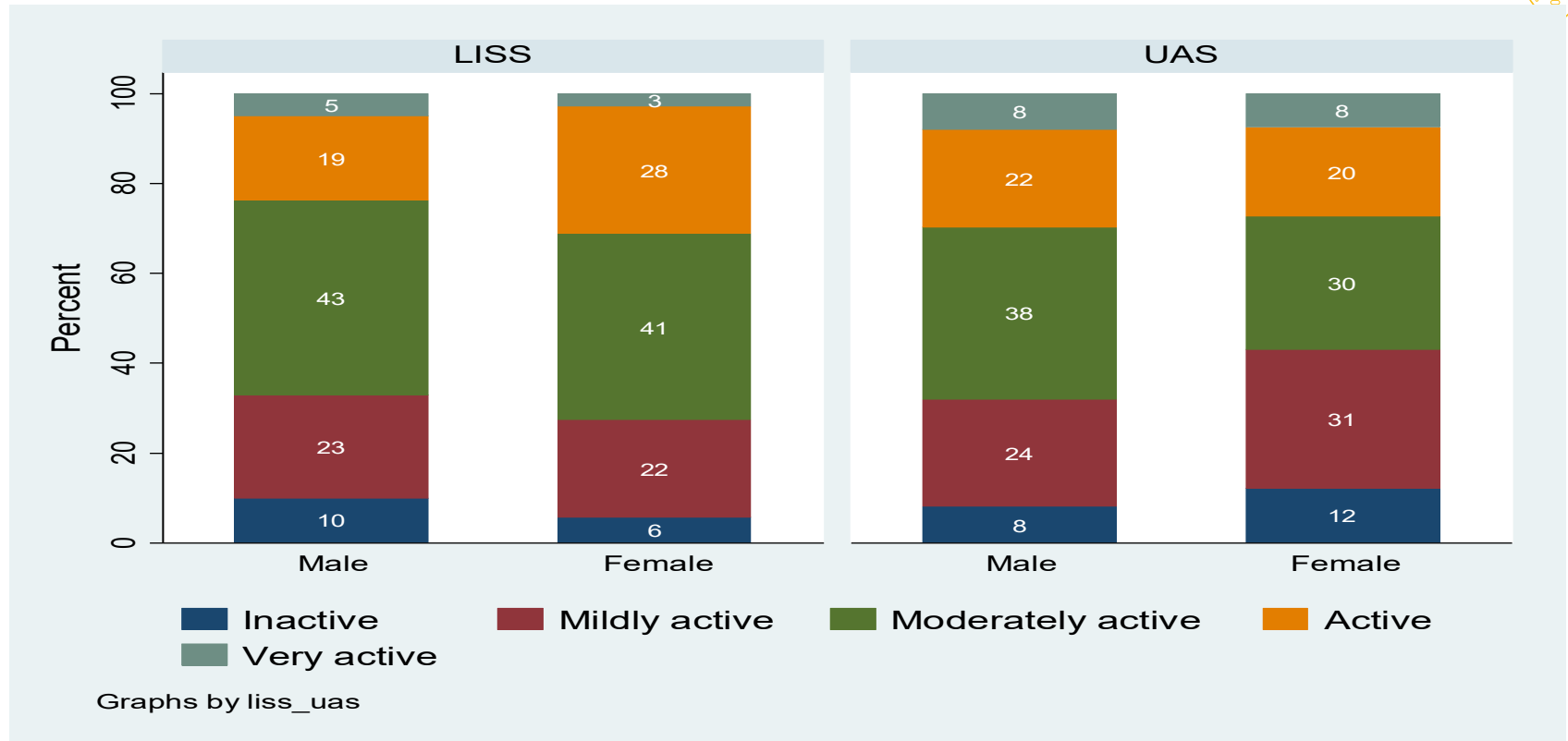
- Americans may use the extremes of the scale more

Broken down by marital status



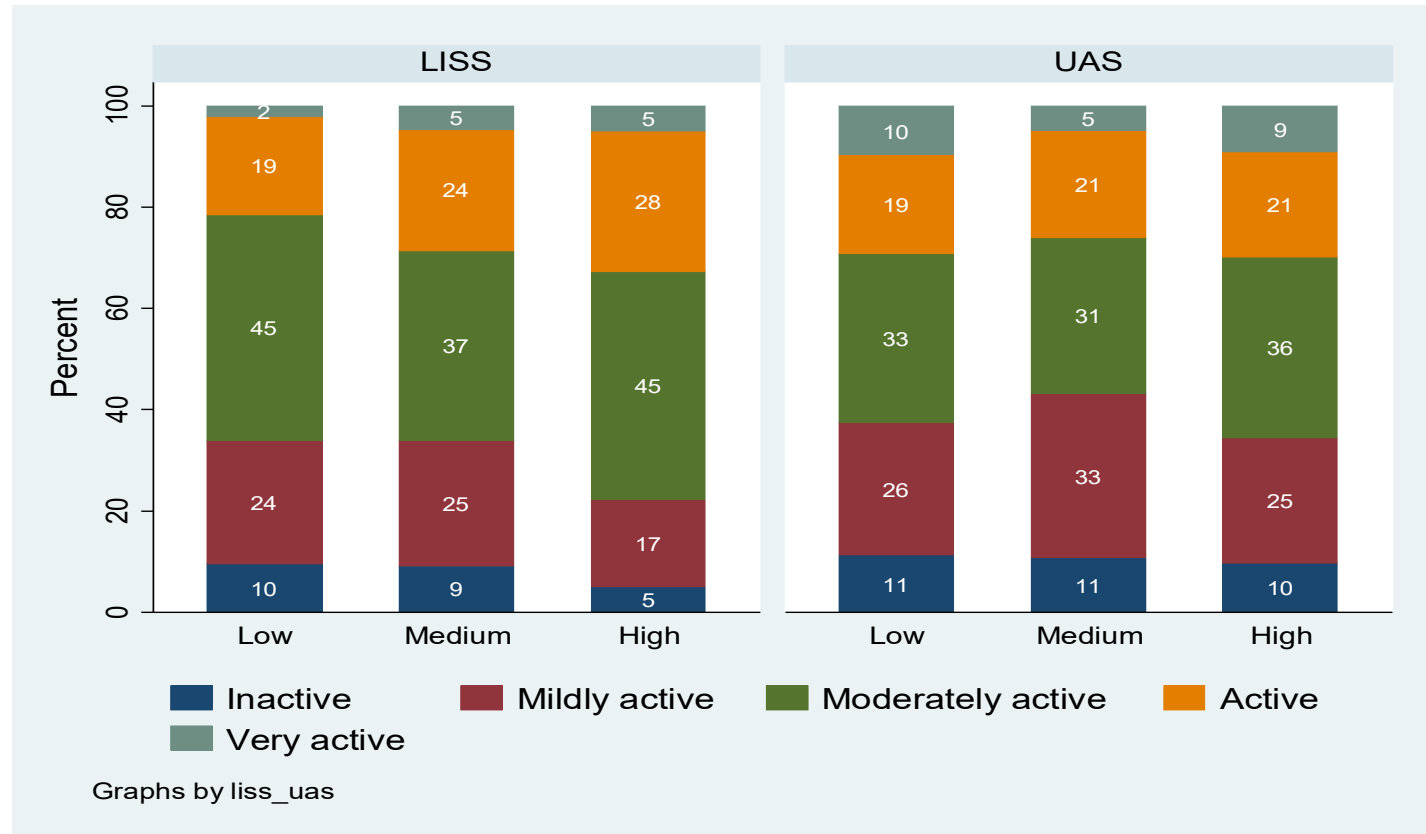
Chi-sq (P-value)	8.52	0.07	3.27	0.51
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Gender



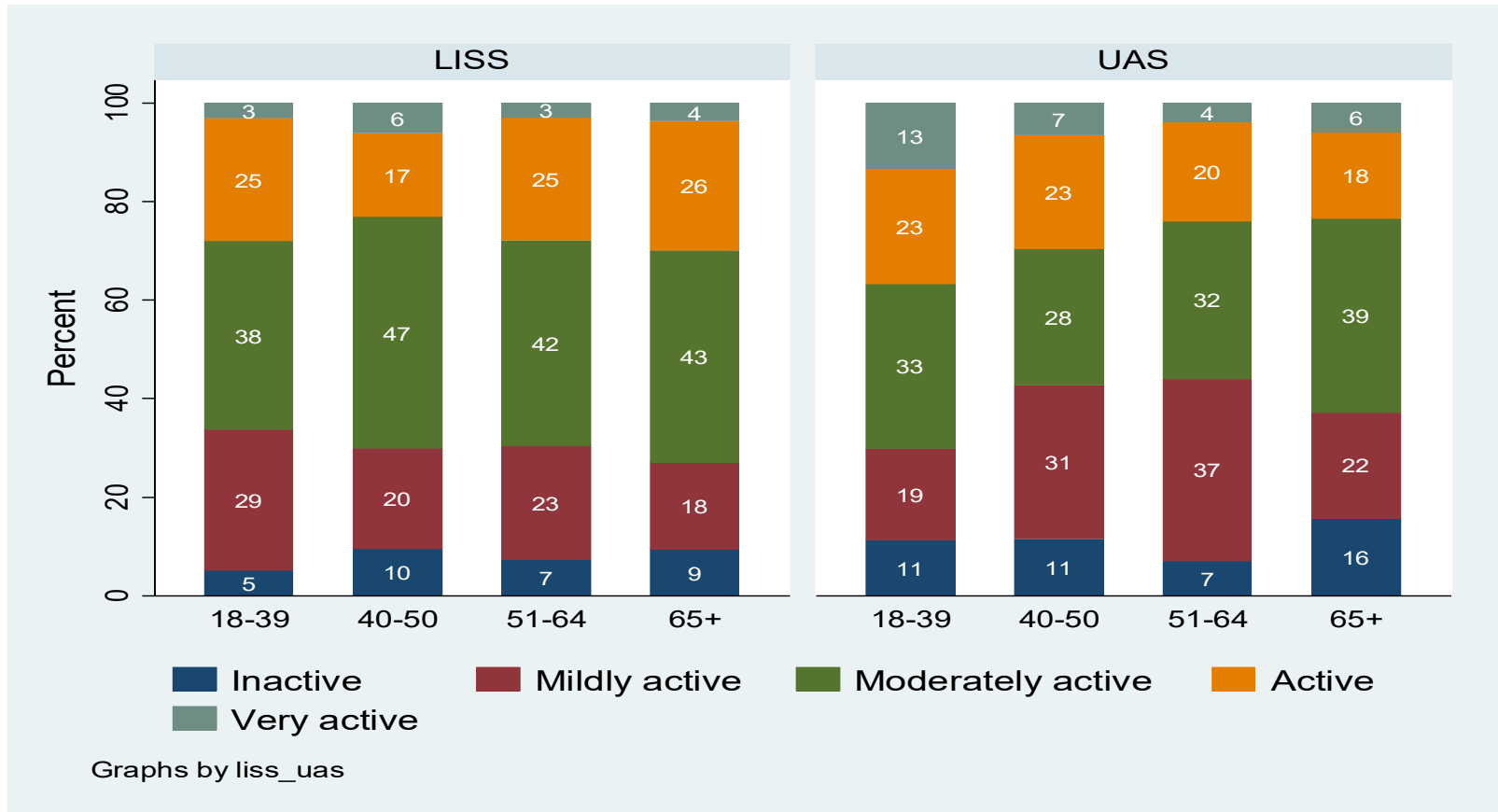
Chi-sq (P-value)	13.77	0.01	4.56	0.34
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Education



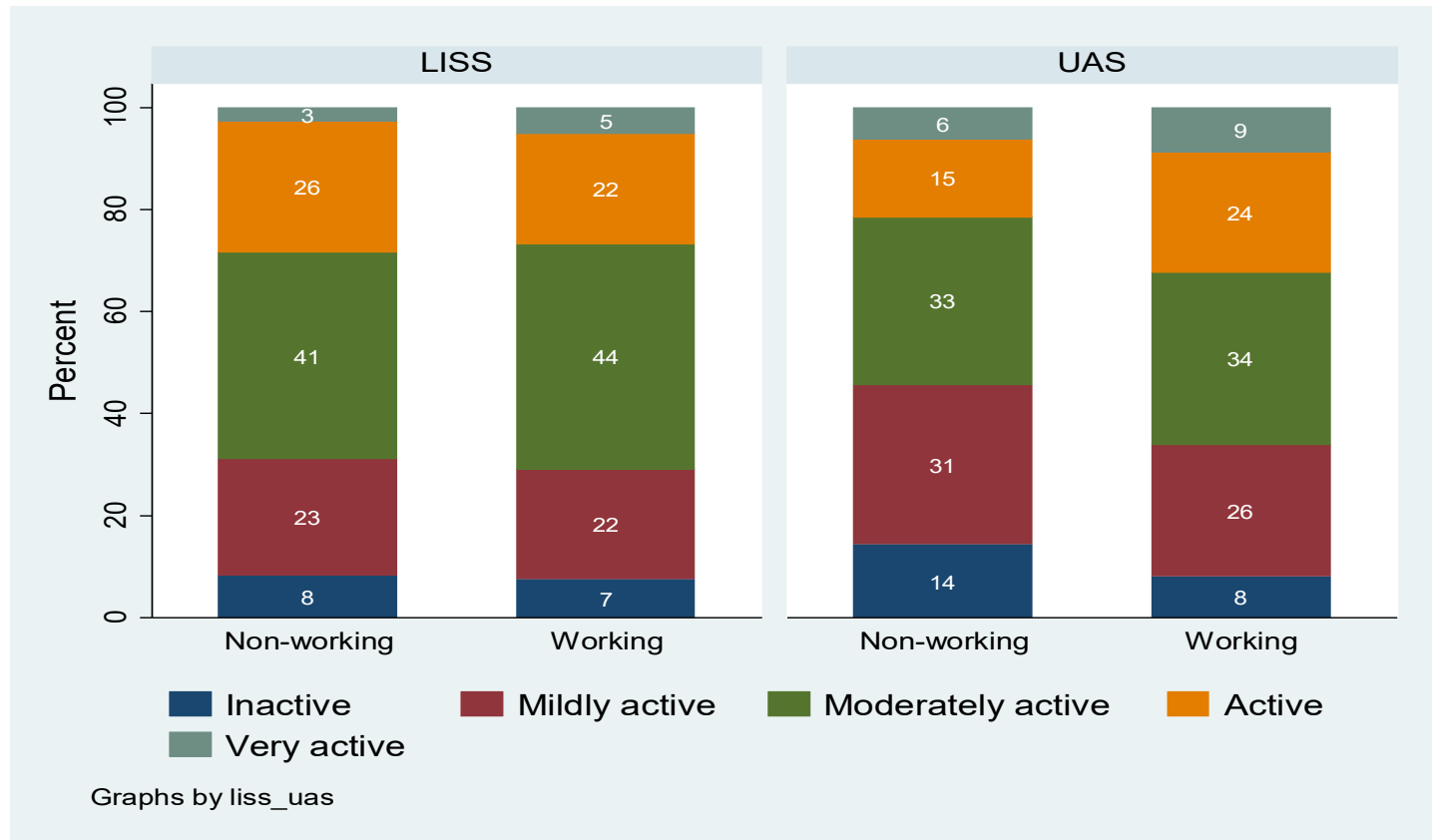
Chi-sq (P-value)	17.15	0.03	3.83	0.87
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Age



Chi-sq (P-value)	15.6	0.21	16.75	0.16
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Work



Chi-sq (P-value)	4.83	0.31	6.5	0.16
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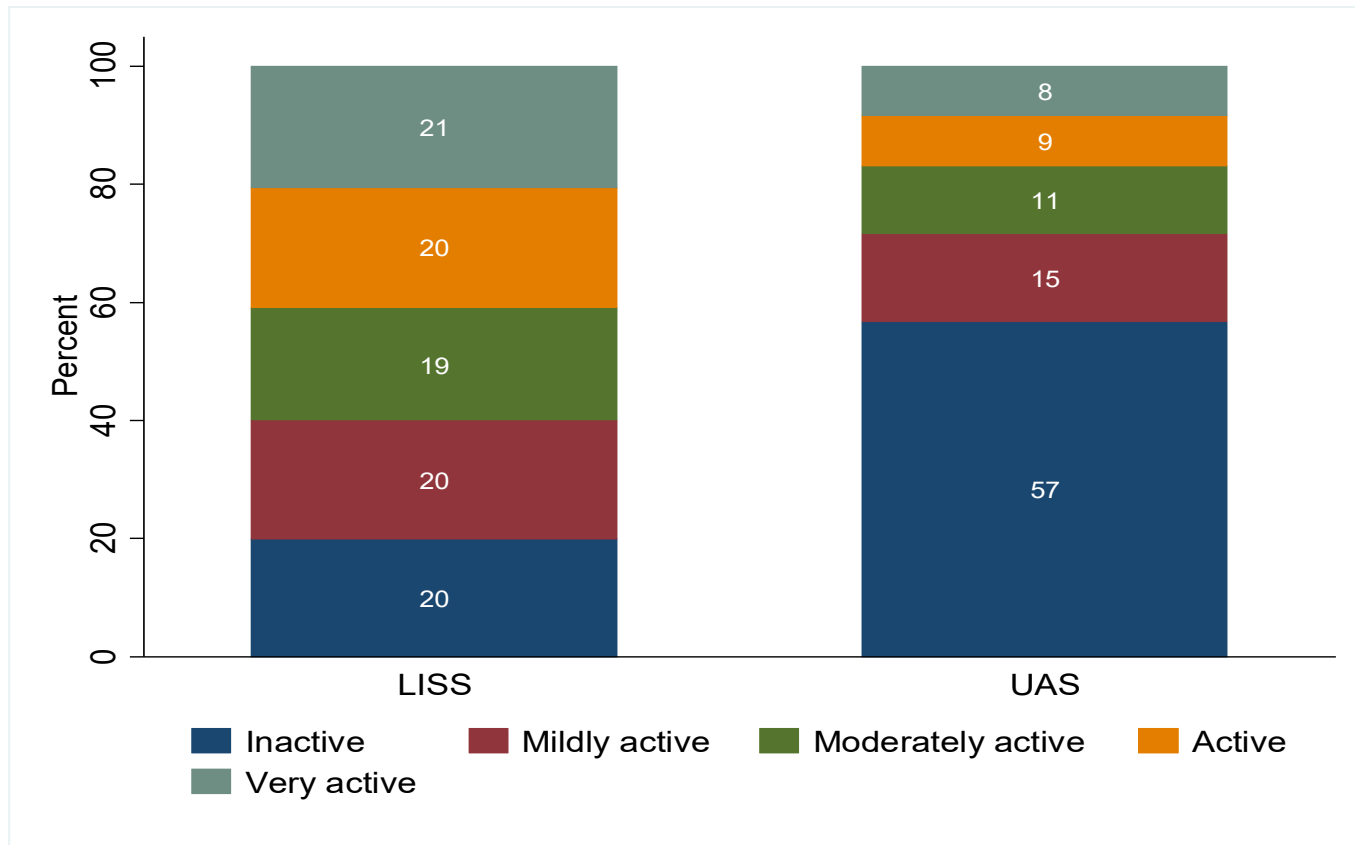
How does this all match up with the Accelerometer Measurements?

To make objective and subjective measures available, we rescaled the objective measures



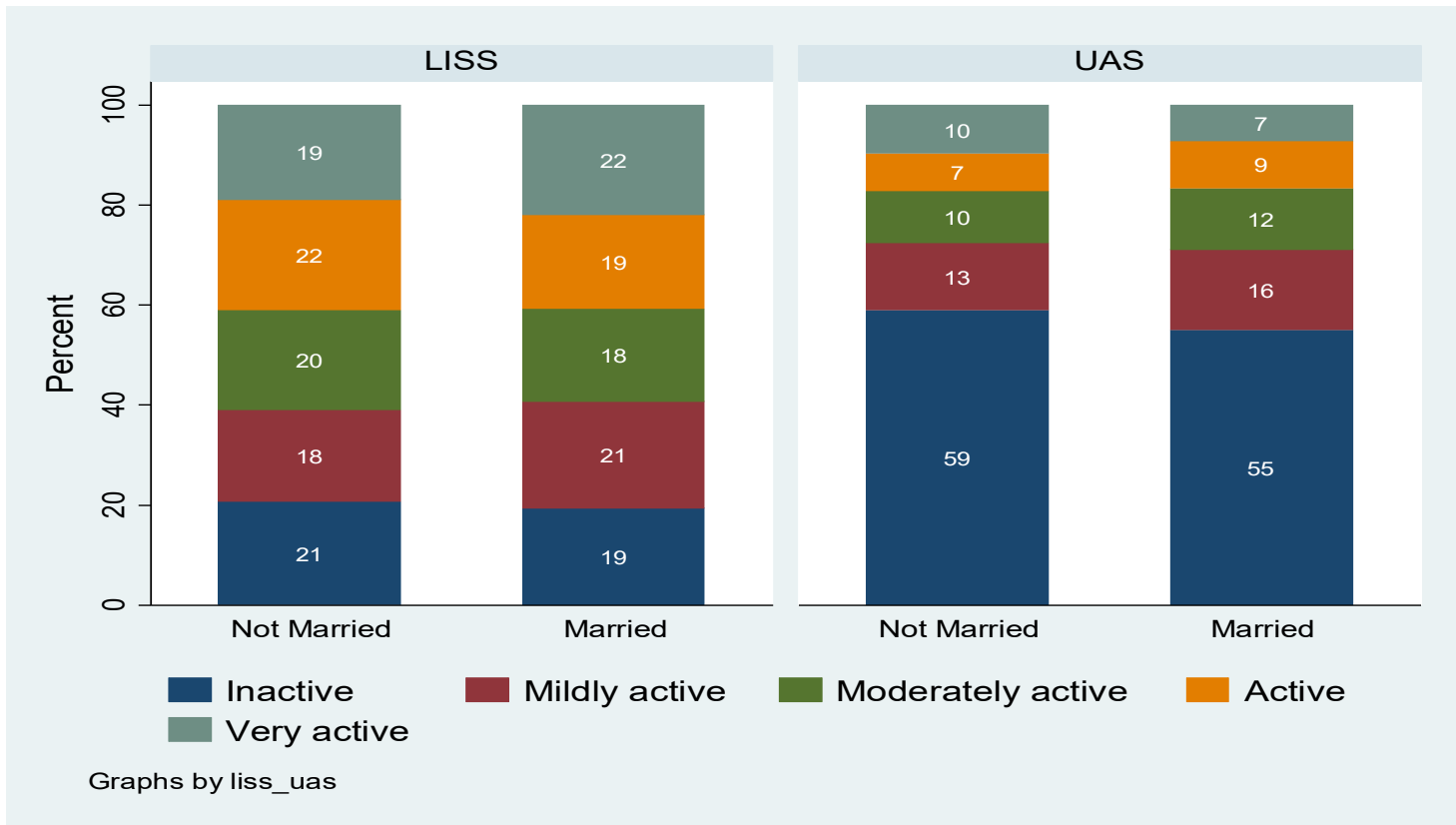
- We first computed each respondent's average of the measurements over the observation period
 - Correcting for how long they wear the device every day
- Next we divide the **Dutch data** into quintiles
 - Assign the label “inactive” if the average falls below the 20th percentile, “mildly active” if between 20th and 40th perc., etc.
 - By construction, 20% of the Dutch respondents fall in each of the five activity categories.
- Use the Dutch cut-off points also for the US data.
- **The objective and subjective scales are not comparable, but we can look at differences across groups.**

Comparing the objective measures



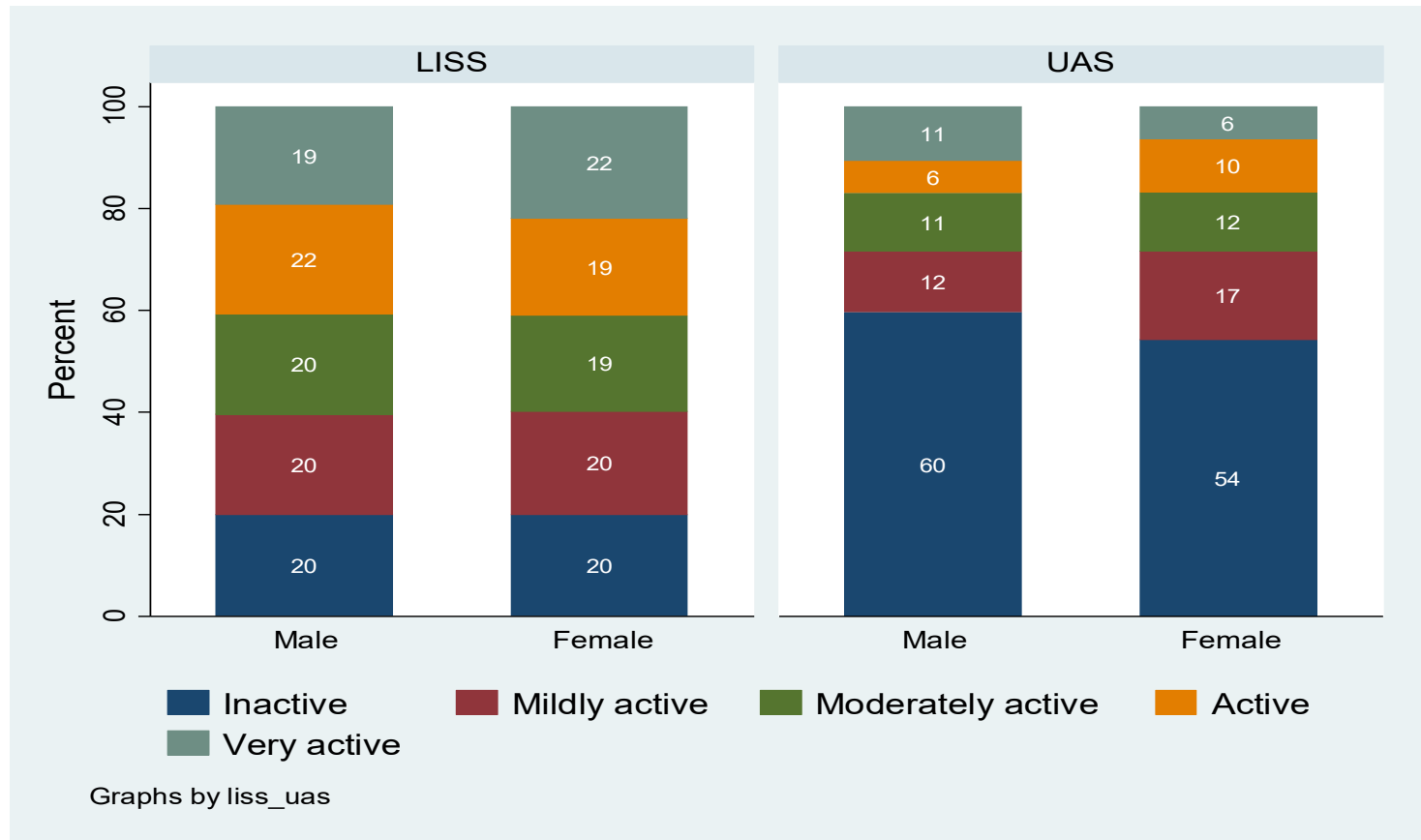
Chi-sq (P-value)	145.83	0
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Broken down by marital status



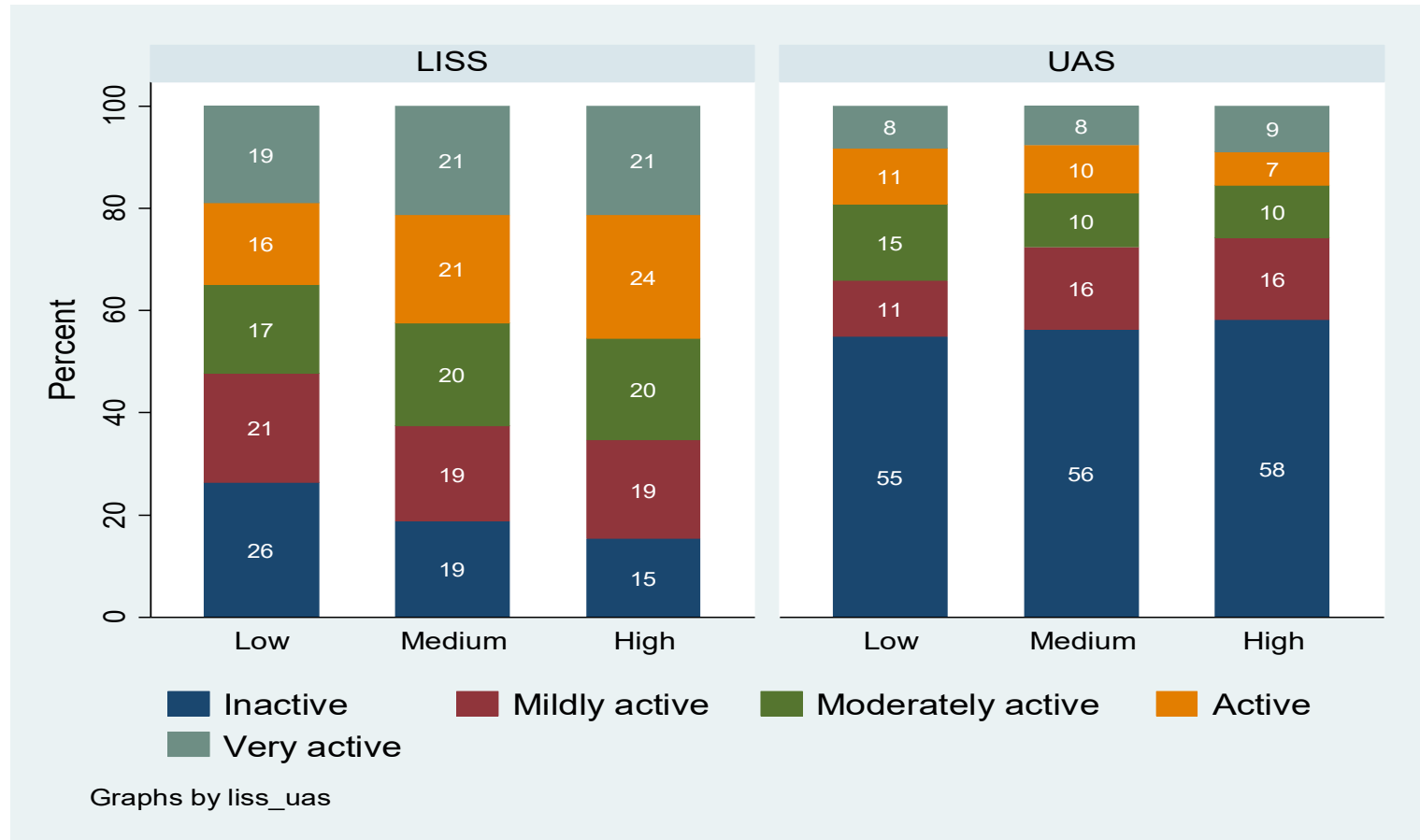
Chi-sq (P-value)	2.98	0.56	1.71	0.79
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Gender



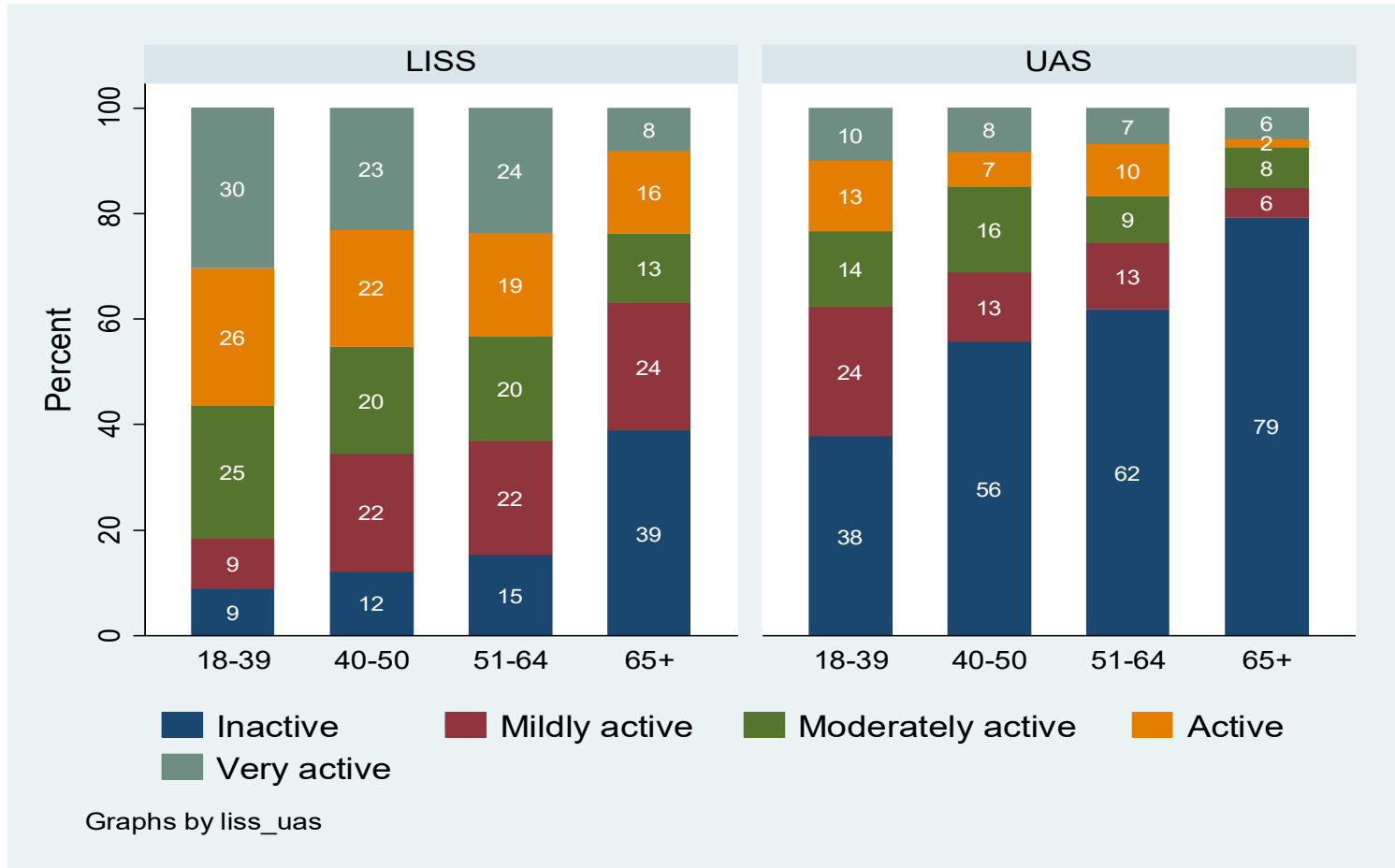
Chi-sq (P-value)	1.3	0.86	5.01	0.29
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Education



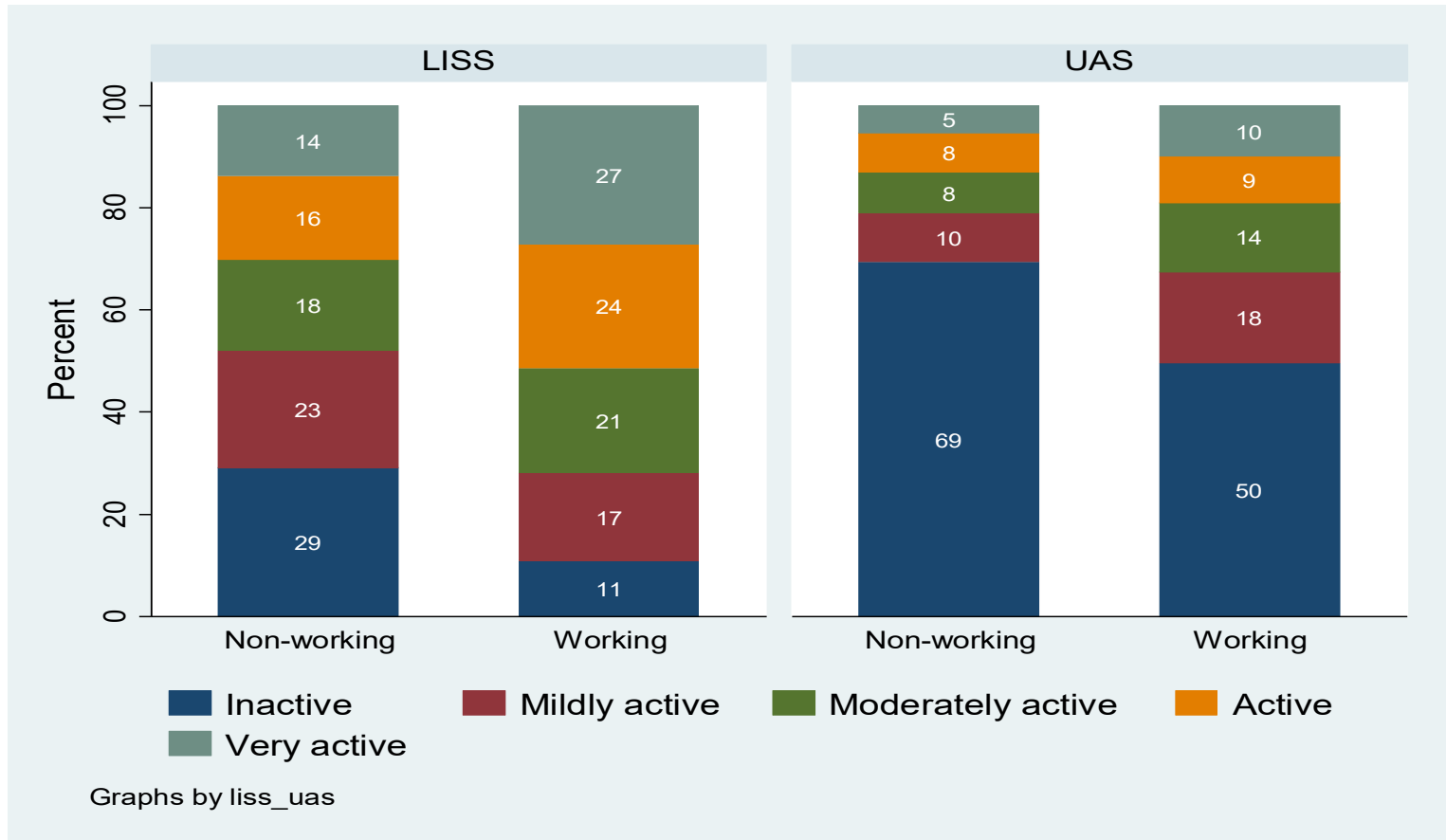
Chi-sq (P-value)	13.53	0.09	3.5	0.9
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Age



Chi-sq (P-value)	104.16	0	29.47	0
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Work



Chi-sq (P-value)	57.9	0	12.46	0.01
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Multivariate Analysis



- When conducting multivariate analyses to explain the pattern of subjective and objective measures of physical activity we find qualitatively similar patterns.
- How much of the observed differences are due to different sample compositions, and how much is due to different behavior of otherwise identical individuals in the two countries?

Oaxaca Decomposition



We are comparing regressions in two groups, A and B

$$Y_\ell = X_\ell' \beta_\ell + \varepsilon_\ell, E(\varepsilon_\ell) = 0, \ell \in (A, B)$$

- We can decompose the difference in a number of ways:

$$E(Y_A) - E(Y_B) =$$

$$\underbrace{\{E(X_A) - E(X_B)\}' \beta_B}_{\textit{Endowment}} + \underbrace{E(X_B)'(\beta_A - \beta_B)}_{\textit{Coefficients}} + \underbrace{\{E(X_A) - E(X_B)\}'(\beta_A - \beta_B)}_{\textit{Interaction}}$$

- The first term corrects for the difference in sample composition; the second term reflects how behavior is different for people with the same characteristics

Oaxaca Decomposition



	Subjective		Objective	
	National averages	p-values	National averages	p-values
Differential				
Prediction_NL	2.94	0.00	3.01	0.00
Prediction_US	2.88	0.00	1.96	0.00
Difference	0.06	0.43	1.05	0.00
Decomposition				
Endowments	-0.25	0.07	-0.34	0.04
Coefficients	0.20	0.08	1.20	0.00
Interaction	0.11	0.52	0.19	0.35

Concluding Remarks



- Objective and subjective measures tell very different stories
- Subjectively, Americans tell us they are about as active as the Dutch; objectively the difference is more than one point on a 1-5 scale.
- Comparisons within countries based on self-reports are also likely to be misleading
 - E.g. across age groups; working versus non-working