

ECO220Y1Y, Test #1, Prof. Murdock **SOLUTIONS**

(1) Because Carlin et al. *randomly* set which video a participant is shown, we *can* infer causality from these experimental data. However, time spent making a choice is *not* randomly set and will be endogenous – related to unobserved/confounding/omitted/lurking variables that are also related with the choice of the best card – and hence we *cannot* infer causality with these observational variables. For example, a lurking variable would be level of understanding of financial decisions and ability to evaluate the technical terms and conditions of each card: this would affect *both* the time spent and the choice of a best card.

(2) (a) The only phrase that applies is *extremely positively skewed*.

(b) 126.6229 ± 34.79833 yields the interval (\$91,825, \$161,421). Nobody makes less than \$100,025 and the 90th percentile is \$160,791. Hence, somewhat more than 90% of employees have a salary within one s.d. of the mean (but it is just a bit more and less than 95%).

(3) 10% (=100*3/30); 37.5% (=100*3/8); 1.0% (=100*3/291); stronger

(b) $291/4 = 72.5$ so we need to know what is the competitiveness of the students closest to that when we sort from smallest to largest competitiveness: $(6+3+6+7+10+32)=64$ and $(6+3+6+7+10+32+49)=113$. So, the 25th percentile is a competitiveness level of 6.

(c) $\bar{X} = \frac{\sum_{i=1}^n x_i}{n} = \frac{5*0+4*2+7*3+21*4+41*5+68*6+60*7+58*8+19*9+8*10}{291} = \frac{1861}{291} = 6.395$

(4) (a)

How well self-assessed competitiveness predicts self-assessed happiness differs across three surveys

Data Source:	2017, Netherlands, Buser et al. 2021 (1)	2023/24, ECO220Y, Prof. Murdock (2)	2024/25, ECO220Y, Prof. Murdock (3)
<u>Dependent variable: Happiness, 0 to 10 Cantril scale</u>			
<u>Competitiveness, 0 to 10 scale</u>	0.080	<u>0.338</u>	<u>0.176</u>
Constant	not reported	<u>4.120</u>	<u>5.199</u>
Observations	3030	410	291
R-squared	0.016	<u>0.097</u>	<u>0.043</u>

Notes: Each column reports a separate regression.

(b) The intercept in these regressions tells the predicted happiness of students who rate themselves a zero on the competitiveness scale (i.e. not competitive at all). In 2024/25 students who are not competitive at all on average report being more than one unit happier on the zero to 10 Cantril ladder scale: the difference between an average of 4.1 happiness versus 5.2 happiness, which is a big difference.

(5) (a) being a full-time worker aged 20 to 64 years in the US in 2023; being a contractor or gig worker; is not;

(b) Among self-employed workers (excluding contractors and gig workers), 48.3% work fully remotely compared to only 14.9% of employees in firms with 1 to 9 employees. Self-employed workers are a whopping 33.4 percentage points more likely to work fully remotely. [Do not need to repeat all the things Table 1 conditioned on because already stated that in Part (a).]

(c) Figure 4 is *not* a histogram because it shows the relationships between two variables – age and the propensity to work from home – and a histogram can only summarize the distribution of one variable. In the US in 2022/23, those aged 20 to 24 on average work about 27% of their full workdays from home.

(d) ... females worked about 0.9 percentage points more workdays from home compared to males. This is a quite small difference and contrary to popular perception that females work substantially more from home.

(e) Only 1 percent of the variation across workers in the percentage of workdays worked from home can be explained by their sex, which means that sex is an extremely weak predictor of how much a person works from home. [Note: Because the prompt says continuing, we do *not* need to repeat the context from the previous part.]

(6) (a) Use second regression to get the predicted value of real GDP per capita, which will approximate the actual value:
 $\$4,353 \text{ USD} = -338087 + 170.538 * 2008$

(b) Nigeria had no GDP/capita growth during the period from 1985 through 2000: the annual estimated growth rate is a decline \$2 per person (yes, less than a cup of coffee!) and the R-squared is less than 0.01. There is simply nothing happening with GDP/capita during this 16-year period. In extremely sharp contrast, from 2000 through 2015, Nigeria had an extremely steady (R-squared is over 0.99!) growth of \$171 USD per year.

(7) Only two: *It is robust to outliers, and it is robust to nonlinear relationships.*

(8) (a) In 2023, countries with a healthy life expectancy that is one year longer on average have happiness that 0.15 units higher on the 0 to 10 Cantril ladder scale. [Note: It could be 10 years and 1.5 units, respectively]

(b) In countries where healthy life expectancy is one year higher, happiness is on average approximately 2.8 percent higher. [Note: You do not need to repeat the year.]

(c) In countries where healthy life expectancy is 10% higher, happiness is on average approximately 0.9 units higher. [Note: You do not need to repeat the year and the scale of happiness. Also, it could be 1% and 0.09 units, respectively]

(d) In countries where healthy life expectancy is 10% higher, happiness is on average approximately 17.7% higher. [Note: You do not need to repeat the year. Also, it could be 1% and 1.8%, respectively.]