

系所組別：老年學研究所乙、丙組

考試科目：流行病學與研究設計

考試日期：0224，節次：3

※ 考生請注意：本試題不可使用計算機

請勿在本試題紙上作答，否則不予計分

1. A researcher suspects that insomnia (失眠) may be one of the risk factors of diabetes (糖尿病). Please design (1) cross-sectional study (2) case-control study, and (3) cohort study, respectively to test his/her hypothesis. Also, specify the limitations of each research design. (30 pts)
2. Please define moderation, mediation, and confound. Also give examples or list rules/approaches that can identify moderation, mediation and confound. (20 pts)
3. Based on the table below, please discuss the effect of age and depression. Be sure to compare their effects based on all the three models. (15 pts)

**Table 2**  
Multivariate analyses for cognitive impairment, OR(95%CI)

	Model 1		Model 2		Model 3	
	OR (95%CI)	p	OR (95%CI)	p	OR (95%CI)	p
Older age	3.05 (2.14-4.35)	<0.001	3.18 (2.22-4.58)	<0.001	2.60 (1.79-3.78)	<0.001
Sex (Male)	0.28 (0.20-0.39)	<0.001	0.32 (0.22-0.46)	<0.001	0.34 (0.25-0.48)	<0.001
Marital status (Single)	1.05 (0.76-1.44)	0.77				
Education (years)						
Elementary school (0-6)	Reference group		Reference group		Reference group	
High school (7-12)	0.46 (0.25-0.86)	0.01	0.39 (0.21-0.70)	0.002	0.47 (0.26-0.85)	0.012
College (>12)	0.35 (0.10-1.19)	0.09	0.28 (0.09-0.87)	0.029	0.30 (0.10-0.95)	0.040
Ethnicity						
Fukienese	Reference group					
Hakka	0.82 (0.55-1.22)	0.33				
Mainlander	0.61 (0.34-1.06)	0.07				
Smoking			1.01 (0.66-1.54)	0.955		
Alcohol drinking			0.74 (0.44-1.24)	0.262		
Depression			1.40 (1.02-1.94)	0.039	1.18 (0.81-1.71)	0.391
Hypertension			0.98 (0.68-1.41)	0.945		
Diabetes			1.82 (1.15-2.88)	0.010	1.70 (1.06-2.74)	0.029
Cardiovascular disease			1.22 (0.82-1.80)	0.312		
Stroke			2.71 (1.25-5.86)	0.011	2.36 (1.06-5.26)	0.036
ADL disability					1.96 (0.85-4.54)	0.116
IADL disability					2.06 (1.38-3.09)	0.029
Functional limitation					1.42 (0.96-2.13)	0.082
Self perceived health						
Good					0.94 (0.57-1.58)	0.836
Fair					1.12 (0.78-1.60)	0.534
Poor					reference group	
Joining organized group activity					0.98 (0.71-1.35)	0.090

(背面仍有題目,請繼續作答)

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4. Based on the table below, please explain the effect of “male”, “age”, and “stressor\*unhealthy” behaviors in Blacks and Whites. (15 pts)

**TABLE 2—Results of Logistic Regressions Predicting DSM-III Depression at Wave 2 Among Blacks (n=864) and Whites (n=1887): Americans’ Changing Lives Survey, 1986 and 1989**

	Blacks, OR (95% CI)	Whites, OR (95% CI)
<b>Control measures (wave 1)</b>		
Male	0.90 (0.56, 1.46)	0.51* (0.37, 0.72)
Age, y	0.97* (0.96, 0.99)	0.99* (0.98, 1.00)
Residence in South	0.93 (0.60, 1.43)	1.19 (0.87, 1.61)
Meets CES-D depression criteria <sup>a</sup>	2.63* (1.70, 4.08)	2.40* (1.77, 3.27)
<b>Socioeconomic measures (wave 1)</b>		
Education, y	0.94 (0.86, 1.02)	0.97 (0.92, 1.03)
Poverty ratio <sup>b</sup>	0.99 (0.86, 1.14)	0.93 (0.86, 1.00)
Employed	1.80 (0.95, 3.41)	1.30 (0.87, 1.94)
Blue-collar occupation	0.56 (0.31, 1.02)	1.08 (0.71, 1.65)
<b>Stressor and unhealthy behavior measures (wave 1)</b>		
Stressors <sup>c</sup>	1.64* (1.22, 2.21)	1.15 (0.94, 1.41)
Unhealthy behaviors <sup>d</sup>	0.90 (0.69, 1.15)	0.97 (0.79, 1.18)
Stressors <sup>c</sup> x unhealthy behaviors	0.81* (0.67, 0.97)	1.11 (0.98, 1.25)
Wald $\chi^2$	61.9*	124.9*
Rescaled R <sup>2</sup>	0.14	0.13

Note. CES-D = Center for Epidemiological Studies—Depression Scale; CI = confidence interval; DSM-III = Diagnostic and Statistical Manual of Mental Disorders, Revised Third Edition; OR = odds ratio.

<sup>a</sup>An 11-item measure scaled to 20 by multiplying the sum by 1.818. A CES-D score of 16 or higher represents meeting the criteria for clinical depression.

<sup>b</sup>Lower scores indicate more impoverished status.

<sup>c</sup>Stressors represent a count of stressful life events that respondents reported experiencing. The inventory of events included 9 events (e.g., loss of job, physical attack, serious injury, and so on).

<sup>d</sup>Unhealthy behaviors include smoking (current or ever), drinking (ever), and being obese (defined as having a body mass index [weight in kilograms divided by height in meters squared] of 30 or higher). The Wald test of difference between Blacks and Whites for unhealthy behaviors is 7.70;  $P = .09$ ;  $df = 1$ .

\* $P < .05$ .

5. Complete the following ANOVA table. (10 pts)

Source of Variance	Sum of Squares(SS)	Degrees of Freedom(df)	Mean Square(MS)	f-ratio	p-Value
Between groups		2			
Within groups	12.3	62			
Total	109.7				

6. Develop four hypotheses that could be tested with the independent t test, ANOVA, Linear regression, and logistic regression, respectively. (10 pts)