Psychology Research Methods (HPS201/HPS771)
Assignment

Task 1

Study 1

According to recent media, it's no longer cool to be famous on Instagram (AFR, 22 June 2022). While this view may apply to teenagers, it is not known if young adults hold the same view as teenagers.

To investigate this question, you recruit a sample of 40 teenagers and 40 young adults (all participants have an Instagram account). For each participant, you record if they agree with the statement "It's cool to be famous on Instagram".

The data from this study can be found in the file Instagram.omv. The variable **Group** indicates if a participant is a teenager or a young adult. The variable **Famous** indicates if a participant agrees (or disagrees) with the statement "It's cool to be famous on Instagram". The variable **Minutes** indicates how many minutes a participant spends on social media per day.

Study 1 - Questions

1. Conduct the appropriate analysis to examine if young adults are significantly more likely to agree with the statement "It's cool to be famous on Instagram" compared to teenagers. Attach the relevant jamovi output to your submission. Report the results of the analysis in APA format including all relevant information. (3 Marks)

Contingency Tables

Contingency Tables

	Famous		
Group	**Agree**	**Disagree**	**Total**
Young Adult	25	15	40
Teenager	16	24	40
Total	41	39	80

χ^2 Tests

	Value	df	p
χ^2	4.05	1	0.044
N	80		

Nominal

	Value
Phi-coefficient	0.23
Cramer's V	0.23

A Chi-square Test for Independence was conducted to examine whether fame on Instagram was perceived as cool dependent on a participant's age. The analysis revealed a significant association between age and the perception that being famous on Instagram is cool, with Young Adults more likely to agree than Teenagers, $\chi^2(df = 1, N = 80) = 4.05$, $p < .05$, $\phi = .55$.

2. Based on the data collected, Dr T-Tock concludes that participants who spend 90 minutes or more on social media per day are significantly more likely to agree (than disagree) with the statement "It's cool to be famous on Instagram". Is Dr T-Tock correct? Justify your response and attach the relevant jamovi output to your submission. (2 Marks)

Proportion Test (N Outcomes)

Proportions - Famous

Level		Count	Proportion
Agree	Observed	26	0.52
	Expected	25.00	0.50
Disagree	Observed	24	0.48
	Expected	25.00	0.50

χ^2 Goodness of Fit

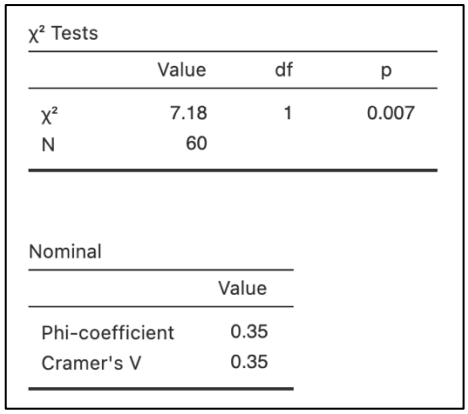
χ^2	df	p
0.08	1	0.777

Dr T-Tock's conclusion is incorrect. A Chi-square Goodness of Fit Test was conducted to test if participants who use social media for more than 90 minutes per day are statistically more likely to agree that being famous on Instagram is cool. The analysis suggested that those participants who use social media for more than 90 minutes per day are not statistically more likely to think that being famous on Instagram is cool, $\chi^2(df = 1, n = 50) = 0.08, p > .05$.

Study 2

Dr Techno claims that students who play a musical instrument are more likely to score a High Distinction (HD) on their Research Methods exam than students who don't play a musical instrument. To evaluate this claim, Dr Techno recruits a sample of university students and classifies each student based on whether they play a musical instrument or not. For each student, Dr Techno also records if they score an HD or not. Dr Techno then runs a Chi-square analysis to test for an association between the variables **Music** (whether a student plays a musical instrument or not) and **Exam** (whether a student scores an HD on their exam or not).

Statistical Output



χ^2 Tests

	Value	df	p
χ^2	7.18	1	0.007
N	60		

Nominal

	Value
Phi-coefficient	0.35
Cramer's V	0.35

Based on the jamovi output and the background information provided, Dr Techno reports the results of the analysis as follows:

A Chi-square Goodness of Fit Test was conducted to test if students who play a musical instrument are more likely to score a High Distinction (HD) on their exam than students who don't. The analysis suggested that students who play a musical instrument are significantly more likely to score a HD on their exam than students who do not play a musical instrument, $\chi^2(df = 1, N = 60) = 7.18, p > .05, \phi = .35$.

Study 2 - Questions

1. List any factual mistakes made by Dr Techno in the above statement. For each mistake, note why Dr Techno is incorrect. (3 Marks)

- The required test for this study is a test of independence (music students (Yes or No) and exam result (HD vs other), or a 2x2 design)
- The correct *p* value as per the results is < .05
- The strength of the relationship is not mentioned in the above and should be commented on as the effect size is moderate ($\phi = .35$).

2. Re-write Dr Techno's statement after correcting any mistakes made. (2 Marks)

A Chi-square test of independence was conducted to test if students who play a musical instrument are more likely to score a High Distinction (HD) on their exam than students who don't. The analysis suggests that students who play a musical instrument are significantly more likely to score a HD (with a moderate effect size) on their exam than students who do not play a musical instrument, $\chi^2(df = 1, N = 60) = 7.18, p < .05, \phi = .35$.

Psychology Research Methods Introductory (HPS201/HPS771)
Assignment

Task 2

Study 1

Research suggests that Attention Deficit Hyperactivity Disorder (ADHD) is frequently accompanied by motor coordination problems (Kaiser et al., 2015).

To investiage this empirically, you take a sample of 80 children who have been diagnosed with ADHD and a second sample of 80 children without ADHD of the same age. You then assess each child's motor coordination using the Developmental Coordination Disorder Questionnaire (DCD-Q), a parent report measure developed to assist in the identification of motor difficulties. Higher scores on the DCD-Q indicate higher levels of motor coordination.

The data from this study can be found in the file DCDQ.omv. The variable **Group** indicates whether a participant was assigned to the ADHD group or the non-ADHD group. The variable DCDQ indicates the obtained DCD-Q score for each participant.

Study 1 - Questions

3. Conduct the appropriate *t*-test to test whether the mean DCD-Q score of the ADHD group is different from the mean DCD-Q score of the non-ADHD group. Attach the relevant jamovi output to your submission. (2 Marks)

Independent Samples T-Test

Independent Samples T-Test

		Statistic	df	p		Effect Size
DCDQ	Student's t	2.61	158.00	0.010	Cohen's d	0.41

Assumptions

Homogeneity of Variances Test (Levene's)

	F	df	df2	p
DCDQ	1.85	1	158	0.176

Note. A low p-value suggests a violation of the assumption of equal variances

Group Descriptives

	Group	N	Mean	Median	SD	SE
DCDQ	NON-ADHD	80	54.69	53.00	12.50	1.40
	ADHD	80	49.00	47.50	14.97	1.67

4. With help from the unit materials, report the results of the analysis in APA format including all relevant information. (3 Marks)

An Independent Samples t-test was conducted to determine whether motor coordination differed between ADHD and Non-ADHD groups. The results showed a significant difference in motor coordination between the ADHD (M = 54.69, SD = 12.5) and the Non-ADHD (M = 49.00, SD = 14.97) groups, $t(158) = 2.61$, $p < .05$, Cohen's $d = .41$

5. Assume you are a clinical psychologist. On the basis of the results of the study, what would be your recommendation for the assessment and/or treatment of children with ADHD? Justify your answer by discussing the observed difference in motor coordination between children with ADHD and typically developing children. (1 Mark)

The examined data shows significant differences found between ADHD effected and non ADHD effected children, suggesting that a greater focus on the development and training of motor coordination is required for children with ADHD to ensure this ability is promoted in line with typically developed children.

Study 2

Dr Zumba would like to examine the effectiveness of a motor training program in improving motor skills in a group of children with ADHD. In the study, a group of children with ADHD complete tasks assessing their balance and catching skills before and after undertaking the motor training program. Scores on the catching skills assessment range from 0 to 100. Scores on the balance assessment range from 0 to 40. Higher scores indicate higher performance on the assessments.

The data from this study can be found in the file motor_skill.omv. The variables **PreBalance** and **PostBalance** indicate balance scores before and after the motor training program. The variables **PreCatching** and **PostCatching** indicate catching scores before and after the motor training program.

Study 2 – Questions

Answer the following questions with reference to the appropriate output (attach the relevant jamovi output to your submission). You are not required to respond in APA format.

3. Dr Zumba concludes that the training program is effective in improving both balance and catching skills in children with ADHD. Is Dr Zumba correct? Justify your response. (2 Marks)

Paired Samples T-Test

Paired Samples T-Test

			Statistic	df	p	Mean Difference	SE Difference		Effect Size
PreBalance	PostBalance	Student's t	-11.11	159	< .001	-5.51	0.5	Cohen's d	-0.88
PreCatching	PostCatching	Student's t	-5.89	159	< .001	-5.63	0.96	Cohen's d	-0.47

Descriptives

	N	Mean	Median	SD	SE
PreBalance	160	20.66	21	4.5	0.36
PostBalance	160	26.16	26	4.6	0.36
PreCatching	160	62.9	63	8.7	0.69
PostCatching	160	68.53	68.5	8.1	0.64

Dr Zumba is correct in his findings. The above results show that improvements were significant between both the pre and post balance group, as well as the pre and post catching group.

4. What would you consider to be the most appropriate interpretation of the analyses conducted (select one of the below response options)? Justify your response. (2 Marks)

   A) Children with ADHD would not be expected to show change in either catching skills or balance following the training program.
   B) Children with ADHD would be expected to show greater change in catching skills than in balance following the training program.
   C) Children with ADHD would be expected to show equal change in both catching skills and balance following the training program.
   D) Children with ADHD would be expected to show greater change in balance than in catching skills following the training program.

While the Paired Samples t-test shows a significant improvement in both mean catching and balance observations, the effect size in the improvement to balance shows a large effect, with the effect size in the change to catching is moderate.

Psychology Research Methods Introductory (HPS201/HPS771)
Assignment

Task 3

Study 1

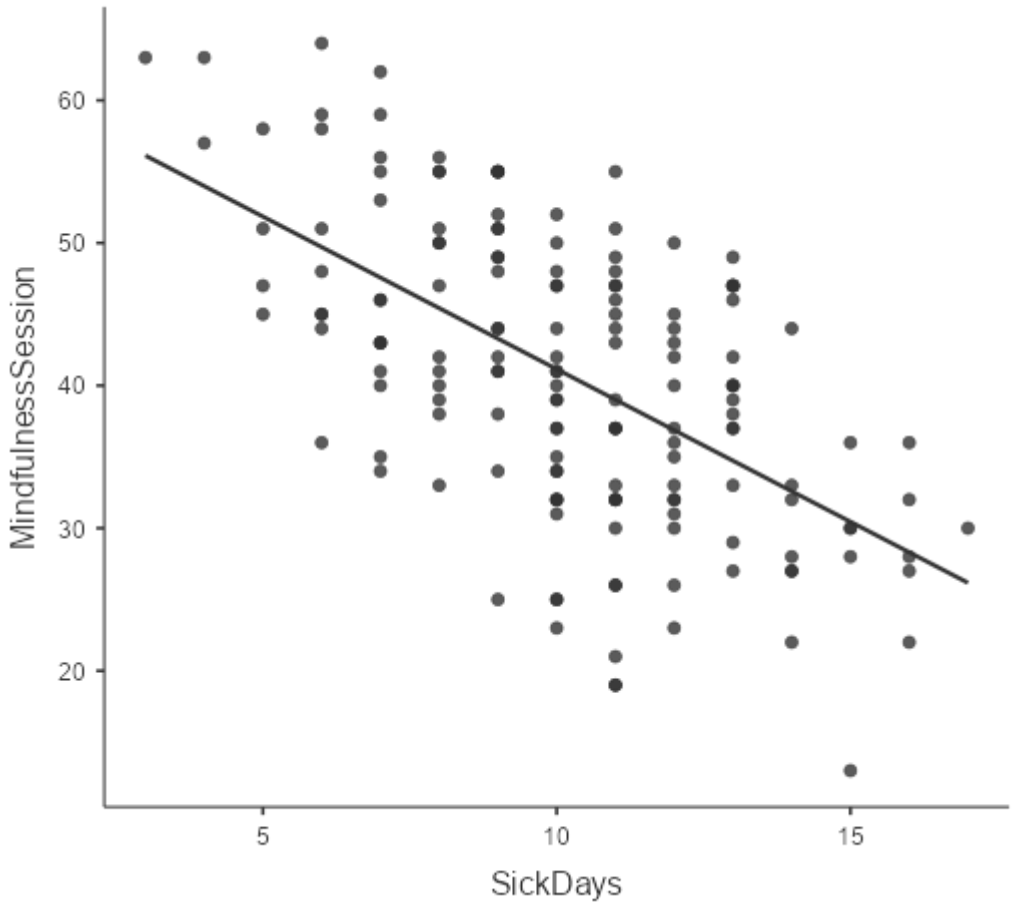
Mindfulness programs have become increasingly popular in the workplace and are now commonly adopted by blue chip businesses such as Google (Financial Times, 2015).

Specifically, recent evidence suggests that regular mindfulness practice may be associated with employee well-being. To test this, you take a sample of 160 Google employees and ask them how many mindfulness sessions they attended in the past year. You also ask them how many sick days they took.

The data from this study can be found in the file Mindfulness.omv. The variable **Mindfulness** indicates the number of mindfulness sessions each participant attended in the past year. The variable **SickDays** indicates the number of sick days each participant took.

Study 1 - Questions

1. Plot the data in jamovi using a scatterplot (attach the relevant jamovi output to your submission). Based on the scatterplot alone, describe the type, direction, and strength of the observed association. Justify your response. (2 Marks)



The association between mindfulness and the number of sick days taken is moderate, linear and negative association. This correlation suggests that the more mindfulness sessions an employee attends, the less often that employee needs to take sick days

2. Conduct the appropriate analysis to investigate the association between the number of mindfulness sessions attended and the number of sick days taken (attach the relevant jamovi output to your submission). Report the results of the analysis in APA format including all relevant information. (3 Marks)

Correlation Matrix

Correlation Matrix

		MindfulnessSession	SickDays
MindfulnessSession	Pearson's r	—	
	p-value	—	
	N	—	
SickDays	Pearson's r	-0.59	—
	p-value	< .001	—
	N	160	—

Note. H_a is negative correlation

A Pearson's correlation analysis was conducted to examine the association between mindfulness session attendance and the number of sick days taken by employees. The analysis revealed a significant association between the variables, r = -.59, N = 160, p < .05.

3. Assume you are an Organizational Psychologist. What would be your recommendation to Google based on the results of this study? Justify your response. (1 Mark)

I would recommend to Google that the mindfulness sessions are effective at reducing the number of sick days required by team members, reducing losses in productivity, and the cost of sick leave to the company (assuming these sessions cost the company less than sick leave).

Study 2

Dr Insomnia is interested in variables that influence exam scores. She recruits a sample of university students and records their end of trimester exam score. The data from this study can be found in the file Insomnia.omv. Dr Insomnia also records the following variables for each student:

Variable	Description	Type
ScaryMovies	How much time (in minutes) did you spend watching scary movies the night before the exam?	Continuous
ReadingTextbook	How many hours did you spend reading the textbook during the trimester?	Continuous
HoursStudied	How many hours did you study in preparation for the exam?	Continuous
PracticeQuestions	How many exam practice questions did you do in preparation for the exam?	Continuous

Study 2 – Questions

Use jamovi to assist you in answering the following question. You are not required to attach the jamovi output for this analysis to your submission.

5. Of the variables measured, Dr Insomnia concludes that HoursStudied is the most relevant variable for explaining individual differences in exam scores. Based on the data collected, is Dr Insomnia correct? Justify your response by ranking the variables associated with exam scores from most relevant to least relevant. Refer to an appropriate statistic to justify your response. (2 Marks)

    1. Scary Movies, $r = -.60$, $p < .05$
    2. Hours Studied, $r = .54$, $p < .05$
    3. Reading Textbook, $r = .26$, $p > .05$
    4. Practice Questions, $r = .13$, $p > .05$

While both scary movies and hours studied have a statistically significant association with exam scores, I would suggest that the association between Exam scores and watching scary movies has a stronger association than Hours Studied, albeit a negative one.

6. After inspecting the data, Dr Insomnia concludes that the correlation between ExamScore and PracticeQuestions is affected (distorted) by the characteristics of the sample obtained for this study. Is Dr Insomnia's conclusion valid? Justify your response. (2 Marks)

The data in this example are distorted by 2 outliers to the main trend. One participant worked on 64 practice questions, receiving a score of 18 for the exam, while another completed 43 questions and received 37 for the exam. These two outliers have significantly distorted the results of the data comparison.