GCE

Psychology

H567/01: Research methods

Advanced GCE

Mark Scheme for June 2019

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All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

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Annotation	Meaning
?	Unclear
AE	Attempts evaluation
BOD	Benefit of doubt
CONT	Context
✗	Cross
EVAL	Evaluation
—	Extendable horizontal line
~~	Extendable horizontal wavy line
IRRL	Significant amount of material which doesn't answer the question
NAQ	Not answered question
RES	Good use of resources
✓	Tick
✓+	Development of point
^	Omission mark

Mark Scheme

Section A: Multiple choice

Ques	Answer	Answer
1	B	Negatively skewed
2	A	Incorrectly accepting the null hypothesis
3	A	when there are a few scores much lower than the rest
4	A	Chi-square
5	B/C	Chi-square/Mann-Whitney
6	C	~
7	A	criterion
8	D	unstructured
9	D	self-ratings of aggression (1 to 10) at different times of day (10am to 10pm)
10	A	detection of ‘gorilla’
11	B	self-selected
12	C	$\frac{1}{20}$
13	D	$r_s = -0.8$
14	D	abstract
15	D	primary
16	B	continuous
17	A	has an independent variable
18	B	conducted in a place where the behaviour studied usually occurs
19	A	a technique that enables qualitative data to be recorded as quantitative
20	C	the extent to which the findings can be applied to the population

Section B: Research design and response

Write an alternative one-tailed hypothesis for this study. [3]					
Question			**Answer**	**Marks**	**Guidance**
21			For example … There will be a positive correlation between a person's weight and their level of extroversion measured on a rating scale. 3 marks are awarded for correctly citing an appropriate alternative hypothesis for this study with increasing level of detail in terms of reference to the variables studied. 1 mark for predicting a positive/negative correlation plus a further 2 marks if both variables are fully operationalised.	**Max 3**	-Context = structure/ weight, personality etc - Can be written in future or present tense. - Use of the word 'significant' is not necessary for full marks. - Award zero if reference to a difference/cause and effect. Eg Larger people will have a more extrovert personality compared to smaller people. - Award zero if a two-tailed hypothesis is written (just stating 'there will be a correlation') - Award zero for null - For full marks both the variables must be operationalised. Not necessary to give units for weight/BMI. Must operationalise extroversion (e.g. numerical scale, self-report). - Can state positive or negative correlation will be found - Full marks can be given for a description of the positive/negative correlation. E.g. As weight increases, the level of extroversion measured on a rating scale will also increase.
			Correctly cited one-tailed alternative hypothesis with both variables operationalised	**3**	
			Correctly cited one-tailed alternative hypothesis with reference to both variables, but only one operationalised Unclear wording - correctly cited one-tailed alternative hypothesis with both variables operationalised	**2**	
			Correctly cited one-tailed alternative hypothesis with reference to both variables, but neither operationalised Unclear wording - correctly cited one-tailed alternative hypothesis with reference to both variables, but only one operationalised	**1**	
			The candidate has not provided any creditworthy information	**0**	

Explain how you would conduct a study using the correlation technique to investigate if there is a relationship between a person's weight and their level of extroversion. Justify your decisions as part of your explanation. You must refer to:
• the sampling technique to obtain participants for the study
• how you would operationalise the variable 'extroversion'
• details of how one ethical consideration would be addressed
• the control of one extraneous variable.
You should use your own experience of practical activities to inform your response. [15]

Question	Answer	Marks	Guidance
22		Max = 15	-Context = structure/ weight, personality etc

Level of response	Details of required features (RFs) included	Justification of decisions made	Reference to own practical work
Good 12-15 marks	-**All 4** required features (RFs) addressed in context -Accurate and detailed knowledge and understanding of each feature in context -**Good** evidence of **application** of required features in context	-**Appropriate justification** of all decisions and *some* is contextualised -Well developed line of reasoning that is clear and logically structured	-**Explicit** reference to own practical work and clear links between own work and the planned research for each required feature. e.g. specific mention of aim or procedural features -For top band (good) 12 marks if just one RF linked, 13 marks if two, 14 marks if three and 15 if all four are linked -If there is no explicit clear link between own practical work and *any* of the 4 required features caps the mark at 11 maximum. Link to their own practical work must inform this study. E.g. the candidate should explain why their choice of sample is better than the one used in their practical work (or is at least as good as it). Justification of the RF can be done by referring to their own practical work. RF1- Basic – Just identifying the sampling technique, Limited – sampling method identified and defined, Reasonable – Identified the sampling method, possibly defined and attempted to explain how this has been carried
Reasonable 8-11 marks	-At least **3 required features in context** -Reasonably accurate and detailed knowledge and understanding of each feature	-**Some** appropriate **justification** of decision related to required features (if no justification in context award 8 marks) -There was a line of reasoning evident with some structure	
Limited 4-7 marks	-At least **two** of the required features addressed in context -**Limited application** of required features **OR** three or all four required features referred to but in a limited way	-**Attempt** to justify decision(s) but weak -Evidence of some structure, but weak	
	If one required feature addressed in detail and justified in context and explicit links made to own practical work award 4 marks		
Basic 1-3 marks	-At least **one** of the required features addressed -**Weak application** of required features **OR** more than one of the required features referred to but in a very brief and/or basic way	-**None**, or if present very weak	

			out in their study. Good – Identified the sampling method and clearly explained how this has been carried out in their study. RF 2- needs to lead to data to be at least ordinal data to be addressed (e.g. qualitative data would not be appropriate for a correlation). Semantic differential scales can be creditworthy and are considered reasonable (good if the numerical scale is given or an explanation of how the data will be made ordinal) weight is not context for this RF. RF 3-Integrity, Respect, Responsibility, Competence. Also allow social sensitivity. Basic – just identifies the ethical consideration, Limited - Limited explanation of the ethical consideration, Reasonable – identifying the ethical consideration/how it can be addressed, Good – Explaining the ethical consideration and clarity on how it can be addressed. RF 4-Basic – just identifies the extraneous variable, Limited explanation of the extraneous variable, Reasonable – identifying the extraneous variable/how it can be controlled, Good – Explaining the extraneous variable and clarity on how it can be controlled.

Outline how you could obtain secondary data to use as the measurement of the variable 'weight'. [3]					
Question			**Answer**	**Marks**	**Guidance**
23	**(a)**		Possible answers include: pre-existing medical records from GP/hospital/health centre; details from insurance company; details from employer, etc	**Max 3**	-Context = structure/ weight/BMI, etc Do not credit a definition on its own. However, a definition can add to a correct response. For example a brief/weak attempt could become an attempt by also providing a definition. Secondary data is pre-existing sources that has already been collected but not for the purpose of this research. Can come up with more than one way to collect the data. The data collected could be for the participants in their study (this could be implicit) No credit to the participant/their family weighing themselves. No credit to reference to collecting data from previous psychological studies/articles not involving their participants.
			Clear description of how secondary data could be obtained in context	**3**	
			Clear description of how secondary data could be obtained but not in context Attempt at description of how secondary data could be obtained in context	**2**	
			Brief and/or weak attempt at description of how secondary data could be obtained (whether in context or not)	**1**	
			The candidate has not provided any creditworthy information	**0**	

Outline one strength of the use of secondary data in this study. [3]					
Question			**Answer**	**Marks**	**Guidance**
23	**(b)**		Likely answers: information already available (more practical); saves time; less personal than asking participants directly, etc	**Max 3**	-Context = structure/ weight, personality etc
			Clear outline of strength in context	**3**	
			Clear outline of strength but not in context / Attempt to outline strength in context	**2**	
			Brief and/or weak attempt to outline strength (whether in context or not)	**1**	
			The candidate has not provided any creditworthy information	**0**	

Outline one weakness having quantitative data in this study. [3]					
Question			**Answer**	**Marks**	**Guidance**
24			Likely answers: the quantitative measurement of 'extroversion' does not provide information about why/how the person is like they are, and may have issues related to how the numerical assessment of the variable is implemented/assessed/interpreted, etc.	**Max 3**	-Context = structure/ weight, personality etc Do not credit weaknesses of correlations that do not apply to quantitative data.
			Clear outline of weakness in context	**3**	
			Clear outline of weakness but not in context / Attempt to outline weakness in context	**2**	
			Brief and/or weak attempt to outline weakness (whether in context or not)	**1**	
			The candidate has not provided any creditworthy information	**0**	

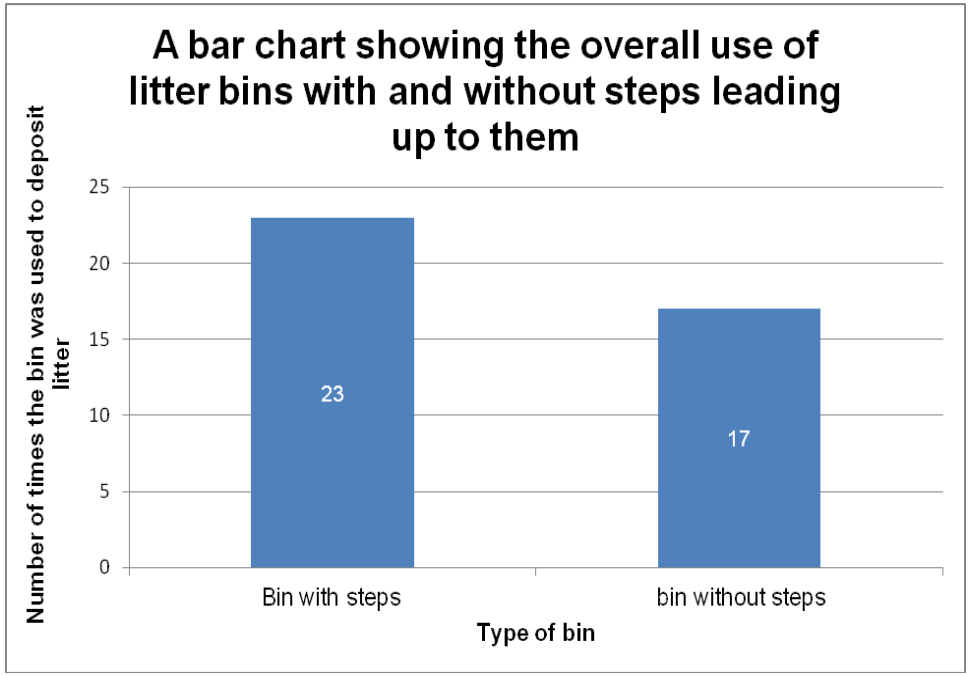
Suggest one open question that could provide additional information in the form of qualitative data for use in this study. [2]					
Question			**Answer**	**Marks**	**Guidance**
25	**(a)**		Possible examples ... -How would you describe your personality? -In what way do you think weight influences your personality?	**Max 2**	-Context = structure/ weight, personality etc Allow anything that could affect your weight or personality (e.g. exercise) -Accept open questions related to the assessment of either variable Credit a statement such as 'Describe your personality' (can lead to an open response).
			Open question clearly presented in context	**2**	
			Open question clearly presented, but not in context **OR** attempt to present open question in context	**1**	
			The candidate has not provided any creditworthy information	**0**	

Outline one strength of having some qualitative data in this study. [3]					
Question			**Answer**	**Marks**	**Guidance**
25	**(b)**		Likely answers: Provides depth/detail/insight; enables the subjective concept of an aspect/type of personality (extroversion) to be investigated, increased validity due to participants being able to express their views/thoughts/feelings, etc	**Max 3**	-Context = structure/ weight, personality etc
			Clear outline of strength in context	**3**	
			Clear outline of strength but not in context / Attempt to outline strength in context	**2**	
			Brief and/or weak attempt to outline strength (whether in context or not)	**1**	
			The candidate has not provided any creditworthy information	**0**	

Explain one way that the design of this study could increase the generalisability of the findings from this study. [3]					
Question			**Answer**	**Marks**	**Guidance**
26			Likely answers: increasing sample size; increasing sample diversity; use of random sampling; improving the ecological validity of the environment of the study; improving the mundane realism of the task, etc	**Max 3**	-Context = structure/ weight, personality etc Generalisability could refer to how representative the sample, the situation and/or task that the participants do. Credit improvements or generalisability of their original study. Do not credit definition of generalisability on its own. It must be linked to a feature from the design of the study.
			A way the design of the study could increase generalisability of the data collected clearly presented in context	**3**	
			A way the design of the study could increase generalisability of the data collected clearly presented but not in context Attempt to present a way the design of the study could increase generalisability of the data collected in context	**2**	
			Brief and/or weak attempt to present a way the design of the study could increase generalisability of the data collected (whether in context or not)	**1**	
			The candidate has not provided any creditworthy information	**0**	

Section C: Data analysis and interpretation

Draw a fully labelled bar chart showing the overall use of the two different types of bin. [4]

Question			Answer	Marks	Guidance
27				**Max 4**	-A title is not necessary, but can add clarity to otherwise unclear labels on axes -Labels on axes must be clear. For example just putting 'category' instead of something like 'type of bin' is unclear (*but remember this can be clarified by a title if provided) -Cap at 3 marks if data presented as a histogram (i.e. no gap between bars) rather than a bar chart Cap at 3 marks if bar chart displays male and females separately (ie. Four bars) – the response has not correctly presented by value each bar representing the overall use of each type of bin.
			1 mark is awarded for correctly presenting by value each bar representing the overall use of each type of bin 1 mark is awarded for clear labelling of the x axis 1 mark is awarded for clear labelling of the y axis 1 mark is awarded for units of measurement (total values) on the y axis (or x axis if the bar chart is presented the other way around)		
			4 features included	**4**	
			3 features included	**3**	
			2 features included	**2**	
			1 feature included	**1**	
			The candidate has not provided any creditworthy information	**0**	

Calculate the percentage of people who used the bin with steps leading up to it. Show your workings and present your finding to two significant figures. [3]					
Question			**Answer**	**Marks**	**Guidance**
28			23/40 x 100 = 58%	**Max 3**	23/40 x 100 = 57.5 = 58 – 3 marks 23/40x100 = 57.5 – 2 marks
			Correct answer with full workings shown	**3**	
			57.5 calculated with full workings shown **OR** correct answer (58) but some of the workings are missing.	**2**	23/40=0.58 – 1 mark 58 – 1 mark 57.5 – 1 mark % sign not required.
			Correct answer shown to 2 or 3 significant figures with no or incorrect workings Some of the correct workings are given. (e.g. 23/40=.58 or .575)	**1**	
			The candidate has not provided any creditworthy information	**0**	

Outline two conclusions that can be obtained from the data collected in this study. [6]					
Question			**Answer**	**Marks**	**Guidance**
29			Conclusions could include: the bin with the steps leading up to it was used more often, suggesting that the steps encouraged people to use the bin more, perhaps because of the novelty value that this afforded etc; Perhaps the bin with steps was used more as people were curious where the steps led to and followed them, then deposited their litter in the bin; Could be a conformity effect of more people using the bin with steps leading other people to copy this behaviour and also use the bin, woman may be more likely to care about the environment as they used the bins more than men, etc. Accept any other appropriate conclusions here.	**6**	-Context = bin/bins, litter, steps -Clear (explicit) interpretation of findings (not simply stating a finding) is required for top band 3 marks could be obtained by justifying their conclusion For information - 57.5% use of bin with steps 42.5% use of bin without steps 65% overall use of bin by females 35% overall use of bin by males 64% of the males used bin with steps 54% of the females used bin with steps
			3 marks for each conclusion		
			Clear, detailed response in context	**3**	
			Clear, detailed response but not in context **OR** attempt in context	**2**	
			Brief and/or weak outline of a conclusion (whether in context or not) **OR** simply stating a finding	**1**	
			The candidate has not provided any creditworthy information	**0**	

The psychologist used the Chi Squared test to analyse the data from this study. Give one reason why this would be the appropriate non-parametric inferential test to use. [2]					
Question			**Answer**	**Marks**	**Guidance**
30	**(a)**		Any one reason in context from: nominal (categorical) data obtained; looking for a difference; independent groups (unrelated)	**Max 2**	-Context = bin/bins, litter, steps, male/female
			One appropriate reason in context	**2**	
			One appropriate reason but not in context	**1**	
			The candidate has not provided any creditworthy information	**0**	

Calculate the degrees of freedom for use with the Chi Squared test in this study. Show your workings.[2]					
Question			**Answer**	**Marks**	**Guidance**
30	**(b)**		df = 1 Workings ... (R-1) x (C-1) (2-1) x (2-1) = 1	**Max 2**	(2-1) x (2-1) = 1 – 2 marks (R-1) x (C-1) = 1 – 2 marks
			Correct answer with workings	**2**	
			Correct answer but not workings (or workings incomplete/unclear/incorrect)	**1**	
			The candidate has not provided any creditworthy information	**0**	

Using the extract from the table of critical values presented below, what is the critical value for use with the Chi Square test in this study at the 5% level of probability? [1]					
Question			**Answer**	**Marks**	**Guidance**
30	**(c)**		3.841	**Max 1**	If nothing written but correct answer identified in the table – this is creditworthy.
			Correct answer provided	**1**	
			The candidate has not provided any creditworthy information	**0**	

The psychologist obtained a calculated value of 0.4058 after analysing the data with the Chi Square test. Write a significance statement presenting this finding showing if the results are significant at the 5% level of probability or not. [3]					
Question			**Answer**	**Marks**	**Guidance**
30	**(d)**		X^2 = 0.4058, df =1, p>0.05 1 mark for each correct feature included ... -calculated value -df -correct indication of significance (i.e. '>')	**Max 3**	Written out version can receive full credit. Eg The Chi Square calculated value is less than the critical value of 3.841. Therefore the difference is not significant at the 5% probability level. 1 mark for comparing the calculated and critical value. 1 mark for identifying the probability is greater than 5% or is not significant at the 5% level of significance. (95% or 1 in 20 is also acceptable) **OR** state the results are not significant 1 mark for 3.841 or df = 1
			3 correct features	**3**	
			2 correct features	**2**	
			1 correct feature	**1**	
			The candidate has not provided any creditworthy information	**0**	

What does the analysis from the Chi Square test inform us regarding the use of the two different types of bins from this study? [3]					
Question			**Answer**	**Marks**	**Guidance**
30	**(e)**		It informs us that there is no difference in the usage of the two different types of bins. People are not more likely to use the bin with steps leading up to it compared to the one without steps.	**Max 3**	-Context = bin/bins, steps For full marks the candidate must refer to the bin with steps and the bin without steps. The null hypothesis is accepted and/or alternative hypothesis rejected - 1 mark
			Clear response in context	**3**	
			Clear response but not in context / Attempt in context	**2**	
			Brief and/or weak attempt (whether in context or not)	**1**	
			The candidate has not provided any creditworthy information	**0**	

Outline one strength of the use of the nominal data collected in this study. [3]					
Question			**Answer**	**Marks**	**Guidance**
31	**(a)**		Answers could include: easy to collect; easy to analyse/interpret; easy to present in visual (graphical) format; possible to carry out a statistical test; etc	**Max 3**	-Context = bin/bins, litter, steps, nudge theory etc (for information) The nominal data is the number of times that the bin with steps and the bin without steps were used It is also whether the participant is male or female. For full marks the response must engage with a feature unique to nominal data that leads to the strength (e.g. categories/frequencies)
			Clear outline of strength in context	**3**	
			Clear outline of strength but not in context / Attempt to outline strength in context	**2**	
			Brief and/or weak attempt to outline strength (whether in context or not)	**1**	
			The candidate has not provided any creditworthy information	**0**	

Outline one weakness of the use of the nominal data collected in this study. [3]					
Question			**Answer**	**Marks**	**Guidance**
31	**(b)**		Answers could include: doesn't provide reasons for the behaviour observed; easy to miss some behaviours; can be misinterpreted; cannot calculate a mean/median score as participants do not have individual scores, etc	**Max 3**	- Context = bin/bins, litter, steps, nudge theory etc The nominal data is the number of times that the bin with steps and the bin without steps were used It is also whether the participant is male or female. For full marks the response must engage with a feature unique to nominal data that leads to the weakness(e.g. categories/frequencies/discontinuous data etc)
			Clear outline of weakness in context	**3**	
			Clear outline of weakness but not in context / Attempt to outline weakness in context	**2**	
			Brief and/or weak attempt to outline weakness (whether in context or not)	**1**	
			The candidate has not provided any creditworthy information	**0**	

Explain what it would mean if there was a 'Type 1 error' in this study. [2]					
Question			**Answer**	**Marks**	**Guidance**
32			A Type 1 error is a 'false positive', meaning that the null hypothesis has been incorrectly rejected (when it is really true). In this study this means that there is no real difference in the use of litter bins that have steps up to them compared to those that don't, but it has been claimed that there is a difference.	**Max 2**	-Context = bin/bins, litter, steps 'false positive' – 1 mark 'Incorrectly rejecting the null hypothesis' – 1 mark 'Incorrectly accepting the alternate/alternative/experimental hypothesis' – 1 mark
			Clear explanation in context	**2**	
			Clear explanation but not in context / **OR** attempted explanation (whether in context or not)	**1**	
			The candidate has not provided any creditworthy information	**0**	

Outline one weakness of the use of event sampling to record the data in this study. [3]					
Question			**Answer**	**Marks**	**Guidance**
33			Answers could include: easy to miss things when attempting to record all occurrences of the behaviour studied; more time consuming; does not give an indication of the time of the behaviours, etc	**Max 3**	-Context = bin/bins, litter, steps - do not credit weaknesses of nominal data/the type of data collected, ethics, sampling, observer bias,. Responses can refer to the 'use of event sampling' in this study such as the study taking place over a long time (4 hours), not taking place over a number of days, etc For full marks the response must engage with a feature specific to event sampling that leads to the weakness
			Clear outline of weakness in context	**3**	
			Clear outline of weakness but not in context / Attempt to outline weakness in context	**2**	
			Brief and/or weak attempt to outline weakness (whether in context or not)	**1**	
			The candidate has not provided any creditworthy information	**0**	

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